



Britannica Student Encyclopedia

An A to Z Encyclopedia

ENCYCLOPEDIA
Britannica®

Britannica Student Encyclopedia

Table of Contents

Volume 1	A
Volume 2.....	B
Volume 3	C
Volume 4.....	D, E
Volume 5	F, G
Volume 6	H, I
Volume 7	J, K, L
Volume 8	M
Volume 9.....	N, O
Volume 10.....	P
Volume 11	Q, R
Volume 12.....	S
Volume 13.....	T
Volume 14.....	U, V
Volume 15.....	W, X, Y, Z
Volume 16	INDEX

A collage of various subjects including a snake, a fly, a satellite, a globe, a flower, a knight, a lemur, and a large red letter A.

Britannica Student Encyclopedia

A

Britannica Student Encyclopedia

Volume 1



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This eBook contains 14 volumes. Each volume has its own page numbering scheme, consisting of a volume number and a page number, separated by a colon.

For example, to go to page 5 of Volume 1, type V3:5 in the "page #" box at the top of the screen and click "Go." To go to page 5 of Volume 2, type V2:5... and so forth.

How to Use the Britannica Student Encyclopedia

The 16 volumes of the *Britannica Student Encyclopedia* from Encyclopædia Britannica contain articles on more than 2,200 topics. The articles are arranged in alphabetical order from

“Aardvark” in Volume 1



to “Zuni” in Volume 15.



The last volume is the index.

Getting Started

There are several ways to find the information you want.

If you are looking for a particular title you can go to the volume that contains articles that start with the same letter and search for your topic there. For example, if you want to read the article on the American Revolution, you can go to the A volume. The words at the top of each page tell you which article is on that page. When you are looking for an article you can page through quickly by looking at those words.

Sometimes there are different ways of naming the same subject. A feature called a title cross-reference can help guide you to the title that we have used. For example, if you look for an article called “Car” in the C volume you will find a note that says

Car

▶ see Automobile.

Then you can look for the Automobile article in the A volume.

You can also search for your topic in the index. If there is an article on your topic the index will tell you which volume and page number to go to to find that article. Sometimes a topic does not have its own article, but you can still find information about that topic in the encyclopedia. The index can tell you where you can find that information. For example, if you look up the topic “dragon” in the index you will see that there is information about dragons in the article called “Animals, Legendary” even though there is no article on dragons.



In addition to the text of the articles, there are many special features that add information.

Most articles have at least one photograph, illustration, or map. Many have more than one.

At the end of most articles, there is a feature called “More to explore.” This feature tells you which articles to go to to get more information about the topic or about something that was mentioned in the article.

“Did You Know?” boxes provide quick facts about many different articles throughout the set.

Certain articles have additional special features.

► More to explore

Flower • Marigold • Plant • Sunflower

Did You Know?

Daisies are perennials, which means that they bloom year after year without having to be replanted.

Did You Know?

Daisies are perennials, which means that they bloom year after year without having to be replanted.

► Daisy

...and slaves of their own. These slaves worked on large farms that supplied food for the army and the royal court.

The colony grew larger and stronger throughout the 1700s. After Great Britain and other countries outlawed the slave trade in the 1800s, Dahomey started selling slaves on oil instead of slaves.

At the end of the 1800s, France conquered Dahomey. The French combined it with other regions to form a colony that was also called Dahomey. This colony gained its independence in 1960. It kept the name of Dahomey until 1975, when it became Benin.

► More to explore

Benin • Slavery

Daisy

Daisies are flowers with flat petals that surround a round center. Daisies belong to the aster family, which also includes chrysanthemums, dabbins, marigolds, sunflowers, and zinnias.

Common types of daisy include the oenothera daisy, the English, or true, daisy, and the Shasta daisy. These daisies grow in Europe, North America, and other parts of the world. Oenothera and English daisies grow in gardens and in the wild. The Shasta daisy is mainly a garden plant.

Daisy plants often grow to about 2 to 3 feet (61 to 91 centimeters) tall. Two types of flower make up each flower head. Ray flowers are what people call

► More to explore

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The continents, countries, U.S. states, and Canadian provinces have colored backgrounds to tell you what kind of unit it is. The continents are purple, the countries are yellow, and the states and provinces are green. These articles also have fact boxes. The fact boxes contain basic information, including population and area figures.

Some of the countries also have timelines of major events in the country's history.

The U.S presidents have timelines of major events in the lives of each president.

28 | Africa

BRITANNICA STUDENT ENCYCLOPEDIA

Africa

Africa is the world's second largest continent. More than 50 countries make up the continent. More than one-eighth of the w

Asia through eastern Africa. In Africa they are deep, long, narrow valleys.

22 | Cameroon

Cameroon

The West African country of Cameroon takes its name from the Rio des Cameroons (River of Sharrim), the name the

BRITANNICA STUDENT ENCYCLOPEDIA

Land
Africa
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North African Countries

Population
(2013 estimate)
14,198,000

Area
(182,567 sq mi
(473,442 sq km))

Capital
Yaoundé

Form of government
Republic

Major cities
Douala, Yaoundé,
Camero, Niamey,
Bamako

18 | Connecticut

Connecticut

The state of Connecticut was named for the Connecticut River. Algonquian Indians called the river Quinnebaug, meaning "Land on the long tidal river." Connecticut is nicknamed the Constitution State because its early settlers wrote a set of laws to govern themselves that later provided ideas for the U.S. Constitution. These laws, known as the Fundamental Orders of Connecticut, were created in 1638 and covered such issues as elections, powers of officials, and taxation. The capital of Connecticut is Hartford.

Geography

Connecticut is the smallest New England state. It is bordered by Massachusetts to the north, Rhode Island to the east, New York to the west, and the Long Island Sound to the south.

Connecticut has highlands in the west and east with a lowland in the middle. The northern part of the western high-

lands is called the Litchfield Hills. They include Mount Mansfield, which is the state's highest point at 2,381 feet (725 meters). The central lowland includes the fertile Connecticut River valley. The eastern highlands are low, wooded hills with many rivers.

People

At the time of the first U.S. census, in 1790, almost all of Connecticut's people were English. In the 1800s, Irish, French Canadian, Italian, Polish, and other European immigrants settled in the state. Today more than four-fifths of Connecticut's residents are of European heritage: African Americans and Hispanic each make up about 9 percent of the population. The state's Asian American and Native American groups are small.

Connecticut has a large population for its size. As a result, it is one of the country's most crowded states. Most of its people live in cities or towns. Bridgeport, on the coast, is the largest city. Other large cities are Hartford, New Haven, and Stamford.

Economy

Real estate, finance, and the insurance industry are major parts of Connecticut's economy. Hartford is known as the Insurance Capital of the World because of the many insurance companies with offices there. Manufacturing businesses in Connecticut produce jet aircraft engines, computer equipment, chemicals, machinery, and other goods. Hart-

Facts About CAMEROON

Population
(2005 estimate)
16,988,000

Area
183,569 sq mi
(475,442 sq km)

Capital
Yaoundé

154 | Bush, George

BRITANNICA STUDENT ENCYCLOPEDIA

Bush, George

After serving two terms as vice president, George Bush became the 43rd president of the United States in 1989. The main event of George's presidency was the Persian Gulf War.

Early Life

George Herbert Walker Bush was born on June 12, 1924, in Milton, Massachusetts. His family later moved to Greenwich, Connecticut. George was the second of five children born to Prescott Sheldon Bush and Dorothy Walker Bush. His father was a banker and later a U.S. senator.

In 1942 Bush joined the U.S. Naval Reserve. As a Navy pilot, he flew many missions in the Pacific during World War II. In 1945 Bush married Barbara Pierce. After the war he attended Yale University and earned a degree in economics. Bush then moved to Texas.

George Bush won the 41st U.S. election.

where he helped start the dealing team and drafting

Political Career

As a member of the Republican Party, Bush ran for the U.S. Senate


Bush is born in Milton, Massachusetts.

June 12, 1924

1966

1976

Bush is elected to the U.S. House of Representatives.



TIMELINE

Bush is born in Milton, Massachusetts.

Bush becomes the head of the Central Intelligence Agency.

Bush is elected to the U.S. House of Representatives.

Bush is elected vice president under President Ronald Reagan.

Bush loses the presidential election to Bill Clinton.

June 12, 1924	1966	1976	1980	1988	1991	1992
Bush is elected to the U.S. House of Representatives.			Bush is elected vice president under President Ronald Reagan.	The United States and allies defeat Iraq in the Persian Gulf War.		



Acropolis means “city at the top” in Greek.

(See Acropolis.)

Airships float in the air like balloons, but they have engines and can be steered.

(See Airship.)

Alchemists were people who were famous for trying to turn lead into gold.

(See Alchemy.)

Almonds are commonly called nuts, but they are actually seeds.

(See Almond.)

At least six types of amoeba are found in human beings.

(See Amoeba.)

Knights in Europe once wore armor made of large steel or iron plates.

(See Armor.)

Aardvark



Although armadillos look like anteaters, they are actually related to elephants, manatees, and dugongs.

The unusual mammal called the armadillo was named by South Africans in the early 1800s. In the local language, Afrikaans, “armadillo” means “earth pig.” This name aptly describes a large, heavily built animal with thin hair and short, stumpy legs. The scientific name of the armadillo is *Orycteropus afer*.

Armadillos live in dry places in Africa south of the Sahara Desert. The armadillo can reach a length of 6 feet (1.8 meters). Its head has huge donkeylike ears, a long snout, and drooping eyelids with long lashes. During the day armadillos sleep in underground burrows. At night they dig underground for their favorite food, termites. They break open the termites’ nests with their massive, flattened claws. Then they suck up the insects with their long tongue.

Female armadillos give birth to one baby per year. After a few weeks the baby begins to follow its mother around. It goes off on its own before it is 1 year old. Armadillos can live for more than 20 years in zoos.

Aaron, Hank

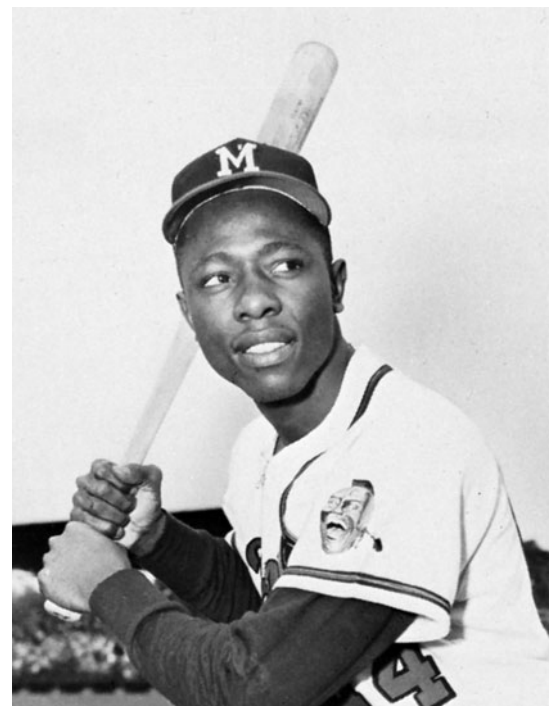
On April 8, 1974, major league baseball star Hank Aaron hit his 715th home run. That home run broke Babe Ruth’s record of 714, which had stood since 1935. Aaron broke several other batting records as well. Because he hit so well he was sometimes called Hammerin’ Hank.

Early Life

Henry Louis Aaron was born on February 5, 1934, in Mobile, Alabama. Even as a young boy Hank hoped to play professional baseball. At age 16 he began playing shortstop with the semiprofessional Mobile Black Bears baseball team.

Career

Aaron began his professional career in 1952. He played a few months as a shortstop with the Indianapolis Clowns of the Negro American League. In 1954



Hank Aaron

Aaron joined the Boston Braves of the National League, where he played mostly as an outfielder.

In 1955 Aaron established himself as a star. He had a .314 batting average, 27 home runs, and 106 runs batted in (RBI). In 1957 he helped lead the Braves to their first World Series title.

The Braves moved to Atlanta, Georgia, at the end of 1965, and Aaron moved with them. After the 1974 baseball season, he was traded to the Milwaukee Brewers of the American League.

Retirement

Aaron retired after the 1976 season with a lifetime batting average of .305. He was elected to the Baseball Hall of Fame on January 13, 1982. At the time he held several career batting records, including 755 home runs, 1,477 extra-base hits, and 2,297 RBIs. His home run record was broken in 2007 by Barry Bonds.

► More to explore

Baseball • Ruth, Babe

Abacus

Long before the invention of the electronic calculator or the computer, people counted and did calculations with a device called an abacus. On this instrument, calculations are made with beads, or counters, instead of numerals. The beads are arranged on wires stretched across a frame. Each wire represents the ones, tens, hundreds, and so on.



The abacus is an ancient device to help solve math problems.

The abacus was probably invented in Mesopotamia by an ancient group of people known as Sumerians. The ancient Egyptians, Greeks, Romans, and Chinese all used the abacus as well.

In about AD 700 the Hindus invented a numeral system that made adding with written numbers as easy as adding on an abacus. The Arabs soon adopted this system, and they introduced it into Europe more than 1,000 years ago. As written calculations became easier, the abacus passed out of use in Europe. But it continues to be used by people in China, Japan, and the Middle East.

Did You Know?

An abacus expert can add numbers almost as fast as a person with a pocket calculator.

Abbreviation

An abbreviation is a shortened form of a word or a phrase. People use abbreviations to save time and space. People are always creating new abbreviations, and old ones are sometimes forgotten.

Some abbreviations are official, such as the codes that the U.S. Postal Service uses for the states. Others are more informal. People often use the abbrevia-

Some Common Abbreviations	
AD	<i>anno Domini</i> (in the year of the Lord)
AM	<i>ante meridiem</i> (before noon)
Ave.	Avenue
BC	before Christ
Blvd.	Boulevard
C	Celsius, centigrade
CD-ROM	compact disc read-only memory
cm, m, km	centimeter, meter, kilometer
Dr.	Doctor
DVD	digital videodisc
F	Fahrenheit
ft	foot, feet
g, kg	gram, kilogram
IOU	I Owe You
Jr.	Junior
l	liter
mph	miles per hour
no.	<i>numero</i> (number)
oz.	ounce
PM	<i>post meridiem</i> (after noon)
Rd.	Road
Sr.	Senior
St.	Saint, Street
vs.	<i>versus</i> (against)

tion ad for the word advertising, for example.

There are a few different kinds of abbreviations. People often abbreviate words by writing only the first letter, one or a few other letters in the word, and a period. For instance, the word teaspoon is abbreviated as “tsp.”

People abbreviate phrases by writing only the first letter of each word. This type of abbreviation is usually written in capital letters with no periods between them. For example, the abbreviation for “as soon as possible” is ASAP.

One of the most common types of abbreviation is called an acronym. Acronyms combine the first letters of a group of words to create a new word. NASA, which stands for National Aeronautics and Space Administration, is an acronym. It is pronounced “NA-suh,” not “N-A-S-A.”

U.S. Postal Codes					
AK	Alaska	KY	Kentucky	NY	New York
AL	Alabama	LA	Louisiana	OH	Ohio
AR	Arkansas	MA	Massachusetts	OK	Oklahoma
AZ	Arizona	MD	Maryland	OR	Oregon
CA	California	ME	Maine	PA	Pennsylvania
CO	Colorado	MI	Michigan	RI	Rhode Island
CT	Connecticut	MN	Minnesota	SC	South Carolina
DC	District of Columbia	MO	Missouri	SD	South Dakota
DE	Delaware	MS	Mississippi	TN	Tennessee
FL	Florida	MT	Montana	TX	Texas
GA	Georgia	NC	North Carolina	UT	Utah
HI	Hawaii	ND	North Dakota	VA	Virginia
IA	Iowa	NE	Nebraska	VT	Vermont
ID	Idaho	NH	New Hampshire	WA	Washington
IL	Illinois	NJ	New Jersey	WI	Wisconsin
IN	Indiana	NM	New Mexico	WV	West Virginia
KS	Kansas	NV	Nevada	WY	Wyoming

Some acronyms become so common that they begin to be used as real words rather than as abbreviations. The word laser started out as an acronym. Its full scientific meaning is “light amplification by stimulated emission of radiation.”

Abernathy, Ralph



Ralph Abernathy

Ralph Abernathy was a leader of the civil rights movement in the United States. He worked closely with Martin Luther King, Jr.

Ralph David Abernathy was born on March 11, 1926, in Linden, Alabama. In 1948 he became a minister in the Baptist church. In 1950 he graduated from Alabama State University with a degree in mathematics. Then he studied sociology at Atlanta University in Atlanta, Georgia.

In 1951 Abernathy became pastor of the First Baptist Church in Montgomery, Alabama. A few years later he met Mar-

tin Luther King, Jr. The two men began fighting laws that kept blacks and whites separated.

One such law forced blacks and whites to sit in separate parts of buses. In 1955 Abernathy and King organized a protest of the Montgomery bus system. Blacks refused to ride the buses until the seating rules were changed. This protest helped start the civil rights movement.

In 1957 King and Abernathy started the Southern Christian Leadership Conference (SCLC). The SCLC was an organization that worked to win equal rights for blacks. After King was murdered in 1968, Abernathy became president of the SCLC.

Abernathy resigned as president of the SCLC in 1977. Then he went back to being a pastor in Atlanta. He died there on April 17, 1990.

► More to explore

Civil Rights Movement • King, Martin Luther, Jr.

Abidjan



Population
(2005 estimate)
urban area,
3,576,000

Abidjan is the largest city of Côte d'Ivoire in West Africa. It was the country's capital until 1983. Then Yamoussoukro was made the capital. Even after that



The coastal city of Abidjan is an important business center of Côte d'Ivoire.

date, however, Abidjan remained the site of most government functions.

Abidjan is located in the southern part of the country. It has a port even though it is separated from the Atlantic Ocean by a sandbar. The Vridi Canal connects the port to the sea.

Because of the port, Abidjan is a center of West African trade. Cocoa, coffee, timber, bananas, pineapples, and fish are shipped from the port. The city also manufactures beer, soap, matches, and automobiles.

Abidjan became the capital of the French colony of Ivory Coast in 1934. Ivory Coast became the independent country of Côte d'Ivoire in 1960. Abidjan remained the capital.

► More to explore

Côte d'Ivoire • Yamoussoukro

Abnaki

The Abnaki (or Abenaki) were a group of Native American tribes who originally

lived in what are now New England and eastern Canada. They included the Passamaquoddy, the Penobscot, and the Pennacook.

The Abnaki hunted animals such as bear, deer, and moose in the forests. They fished in lakes and rivers. The coastal tribes caught lobsters and gathered oysters and clams. The southern tribes planted fields of corn, squash, and beans.

The Abnaki generally lived in small bands of related families. Bands lived part of the year in permanent villages and part of the year in hunting camps. Their houses were cone-shaped wigwams made from a wooden frame covered with bark.

In the early 1600s Europeans began arriving in Abnaki territory. Most were traders who offered metal tools and other European goods in exchange for furs. But the Europeans also brought diseases such as smallpox that killed tribespeople by the thousands.



Abnaki Native Americans perform a traditional dance in Vermont.

After the American Revolution (1775–83) the Americans took over much of the tribes' territory. Without land, the Abnaki could no longer live in their traditional way. Some managed to change their way of life and survive. In the late 20th century about 1,000 Abnaki lived in Quebec, Canada. More than 6,000 Abnaki lived in the United States.

► More to explore

Native Americans

Abolitionist Movement

In the late 1700s people who were opposed to slavery began a movement to abolish, or end, the practice. This was called the abolitionist movement. Followers of the movement were known as abolitionists.

Europeans had begun using Africans as slaves in the late 1400s. After Europeans discovered the Americas they set up colonies there. Soon many Africans were being shipped to the Americas to work on the sugar and cotton plantations in the colonies.

In the 1600s certain people in the British colonies of North America condemned slavery on religious grounds. There were few other protests, however, until the 1700s. Slowly but steadily, more and more people became opposed to the idea of holding other human beings as private property.



An antislavery meeting is pictured in London, England, in 1840.

Antislavery Efforts Around the World

The first formal organization to emerge in the abolitionist movement was the Abolition Society, founded in 1787 in Britain. By 1807 Britain had abolished the slave trade with its colonies. By 1833 all slaves in the British colonies in the Western Hemisphere were freed. Other countries in Europe soon followed this example. France outlawed the slave trade by 1819, and in 1848 slavery was banned in all French colonies.

Slavery was abolished country by country in South America. In Chile the first antislavery law was passed as early as 1811. Slavery finally ended in South America when Brazil passed an antislavery law in 1888.

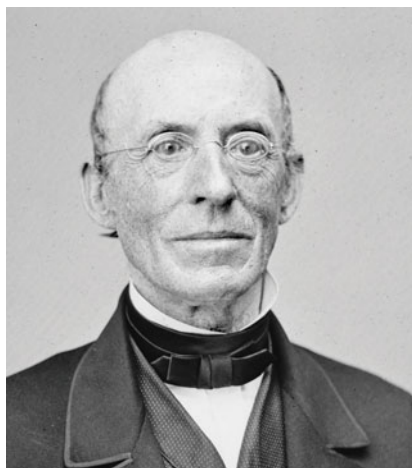
United States

In the United States the slave trade was officially abolished in 1807, but the smuggling of slaves continued until the Civil War. As cotton plantations devel-

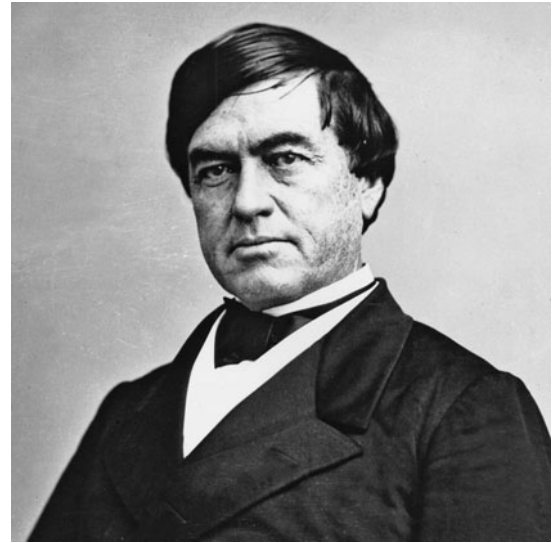
oped in the South, the demand for slaves increased. The Southern states thus supported slavery. In contrast, by 1804 all of the states north of Maryland had abolished slavery. The North became the center of the abolitionist movement in the United States.

The best-known leader of this movement was William Lloyd Garrison. He founded the American Anti-Slavery Society in 1833. The U.S. abolitionists did not always agree about how to end slavery, however. Some wanted the government to pass laws to end slavery. Others tried to help individual slaves gain their freedom. They established the Underground Railroad to help escaping slaves reach places of safety in the North or in Canada.

The abolitionist movement gained strength as more and more people learned about the evils of slavery. People were disgusted by the cruelty of the slave hunters who brought escaped slaves back to their owners. Harriet Beecher Stowe's novel *Uncle Tom's Cabin* (1852) presented powerful descriptions of how



William Lloyd Garrison



Cassius Marcellus Clay worked to end slavery even though he was from a slaveholding family in the South.

slaves were mistreated. The book became extraordinarily popular.

In November 1860 Abraham Lincoln was elected president of the United States. Lincoln opposed the spread of slavery. The South felt threatened. Over the next three months a series of Southern states separated from the United States and formed the Confederacy. This led to the American Civil War (1861–65). During the fighting, in 1863, Lincoln issued the Emancipation Proclamation. This document freed all slaves in the Confederate states. In 1865 the Confederacy was defeated. Then slavery was abolished in the United States by the 13th Amendment to the Constitution.

► More to explore

American Civil War • Brown, John • Emancipation Proclamation • Lincoln, Abraham • Slavery • Stowe, Harriet Beecher • Underground Railroad

Did You Know?

An abolitionist named John Brown stole weapons from the U.S. government in 1859. He wanted to start a slave rebellion. He was killed but became an abolitionist hero.

Aboriginal Peoples

Aboriginal peoples, or aborigines, are groups of people who have lived in one area for many thousands of years. In the past, aborigines lived in areas far from other cultures. They were unknown until outsiders came into their lands.

Today there are only a few places left in the world where outsiders have not affected aboriginal cultures. Aborigines still live in the rain forests of South America, on the island of New Guinea, and in the mountains of Malaysia and the Philippines. They have kept many of their original ways of life.

The Australian Aborigines are probably the best-known aboriginal society. They came to Australia more than 40,000 years ago. They still live there today.

Australian Aborigines were originally hunter-gatherer tribes that moved from

place to place to find food and water. They lived in caves or built short-term shelters from branches, bark, and animal skins. The men fished and hunted for animals. The women gathered plants, eggs, and other food.

The Aborigines' lives changed when Europeans arrived in Australia more than 200 years ago. The Europeans forced the Aborigines to move off their land and to change their way of life. Many Aborigines died defending their land. Many others died from diseases brought by the Europeans.

Today Aborigines live in all parts of Australia and do all kinds of work. But many Aborigines are poor. They do not have the same opportunities as most other Australians.

► More to explore

Australia • Culture

Abraham

Abraham is an important figure in the Jewish, Christian, and Islamic religions. He is considered to be the patriarch, or founding father, of the nation of Israel.

The story of Abraham is told in Genesis, the first book of the Bible. In modern times archaeologists have found ancient clay tablets that tell more of the story.

According to the Bible, Abraham came from Ur in Mesopotamia (now Iraq). His people were shepherders who moved from place to place. About 4,000 years ago they settled near Haran, in



An Australian Aborigine stands before a large rock known as Uluru/Ayers Rock. Parts of the rock and the land around it are sacred to the Aborigines of the area.



Christians, Jews, and Muslims all see Abraham as an important religious figure. A painting shows Abraham during his journey to Canaan.

what is now Turkey. There God instructed Abraham to leave his people and move to a new land. Abraham obeyed.

At age 75 he journeyed to Canaan (the land that is now Israel) with his wife, Sarah, and others. God told him that he and his children would inherit that land. At first Abraham and Sarah thought they were too old to have children. Abraham's first child, Ishmael, was born to a servant of Sarah's. But Isaac was born later to Sarah. The Bible says that Abraham died at the age of 175.

Isaac inherited the land of Canaan. After his death the land went to his son, Jacob. God changed Jacob's name to Israel. His descendants were the Jewish people. In Christianity, Abraham is considered to be the father of all who believe in God. Abraham is important to Muslims as well. They are said to be the

descendants of Abraham's son Ishmael. In the Koran, the holy book of Islam, it is said that Abraham and Ishmael built the Kaaba. The Kaaba, a shrine in Mecca, Saudi Arabia, is the holiest place in the Islamic world.

► More to explore

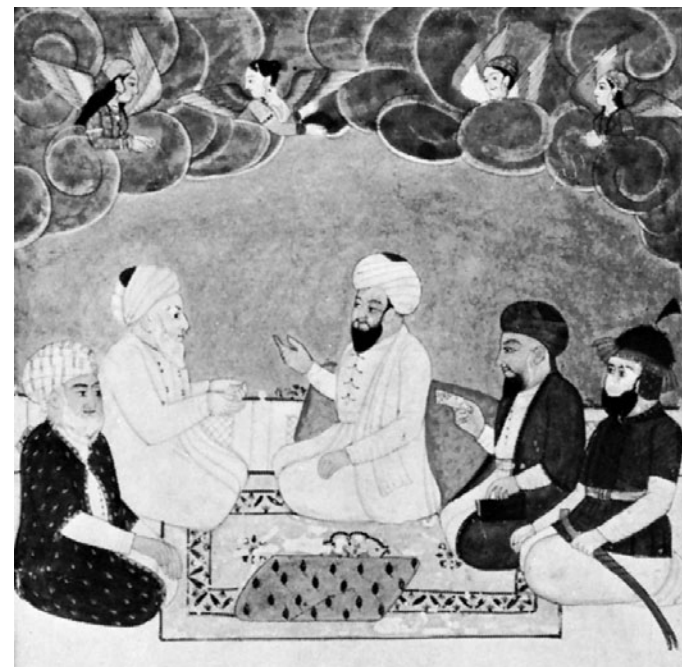
Bible • Christianity • Islam • Judaism
• Koran • Mecca • Mesopotamia

Absaroka

► see Crow.

Abu Bakr

Abu Bakr was an adviser to the prophet Muhammad, the founder of Islam. After Muhammad's death, Abu Bakr took charge of the Islamic world. He is known as the first caliph.



Abu Bakr (second from left) was an important Islamic leader.

Abu Bakr was born in the Arabian town of Mecca (now in Saudi Arabia), which was also the birthplace of Muhammad. His daughter 'A'ishah became one of Muhammad's wives.

While Muhammad was dying, he called upon Abu Bakr to lead prayers and pilgrimages in his place. By that time Muhammad was more than the religious leader of the Islamic lands; he was their political ruler as well. After Muhammad died in 632, Abu Bakr ruled as caliph. Caliph means "successor" (one who comes afterward). The Islamic lands were called the Caliphate.

As caliph, Abu Bakr fought wars against Arabian tribes who rebelled against him. He soon brought the tribes of Arabia under Muslim rule. Abu Bakr then sent armies into what are now Syria and Iraq. This began a series of conquests that spread Islam far beyond Arabia. Abu Bakr died in 634.

► More to explore

Caliphate • Islam • Mecca
• Muhammad

Abu Dhabi



Population
(2007 estimate)
633,140

Abu Dhabi is the capital of the United Arab Emirates, a union of Arab states on the Arabian Peninsula. It is also the capi-



The Sultan Zayed Mosque in Abu Dhabi was named for a longtime ruler of the United Arab Emirates. The sultan was buried in the mosque when he died in 2004.

tal of Abu Dhabi kingdom, the largest of the seven states.

The city of Abu Dhabi occupies most of a small triangular island in the Persian Gulf. The island is connected to the mainland by a short bridge.

Local tribesmen settled Abu Dhabi in 1761. Through most of its history the town remained small and undeveloped. This changed when rich oil fields were discovered in Abu Dhabi in 1958. Oil revenues were used to modernize the town. Electricity, running water, and a central sewage system were installed. Modern buildings and a new port were built. With modernization, the population grew.

The United Arab Emirates gained independence from Great Britain in 1971. Abu Dhabi became the permanent capital of the federation in the early 1990s.

► More to explore

United Arab Emirates

Abuja



Population
(2006 census),
Federal Capital
Territory,
1,405,201

Abuja is the capital of the African country of Nigeria. It was built in the 1980s to replace the crowded coastal city of Lagos as the capital.

Abuja is located near the center of Nigeria in an area called the Federal Capital Territory. It is about 300 miles (480 kilometers) northeast of Lagos. The city is built on the grass-covered Chukuku Hills. The climate is cooler and less humid than that of Lagos.

Abuja is divided into two zones. The central area contains the government buildings. The other zone provides housing, shopping facilities, and other services for the people who live there.



The Nigerian presidential palace is located in the hills of the country's capital, Abuja.

The government started planning the new city of Abuja in 1976. It took more than 10 years to build the city, but the population grew even before it was finished. Abuja officially became the capital in 1991.

► More to explore

Nigeria

Accra



Population
(2003 estimate)
1,847,432

Accra is the capital and largest city of the West African country of Ghana. Its name comes from the word *nkran* in the Akan language. This refers to the black ants that thrive in the area. Accra is situated on the Gulf of Guinea.

Accra is the site of Ghana's main government offices. It is also the economic center of Ghana. It contains the head offices of all the country's large banks and trading firms. The city also has large open markets. Its main products are processed food, lumber, and textiles.

The city of Accra was formed in 1877. By that time the British had gained control of the whole area. It became known as the colony of the Gold Coast. Accra was the capital of the colony. The modern city of Accra was carefully planned and laid out between 1920 and 1930.

When the Gold Coast gained independence as Ghana in 1957, Accra remained the capital.

► More to explore

Ghana

Acid and Base

Acids and bases are two related groups of chemicals. They are important to living things and have many uses in industry.

Acids

Some acids are found in food. They include acetic acid in vinegar, lactic acid in milk, and citric acid in lemons. They often have a sour taste. Other acids are found in animals. The stomach makes an acid that helps break down food.

Some acids do not come from living things. These can be so strong that they can corrode, or break down, metals. They should not be tasted or touched. Sulfuric acid is one example. It is used to make fertilizers, dyes, drugs, explosives, and certain batteries. When an acid is dissolved in water the result is called an acidic solution.

Bases

Bases may feel slippery in water. Some are used in foods or medicines. These often have a bitter taste. Examples of bases include baking soda and milk of magnesia. Other bases are used in manufacturing. These are too strong to be tasted or touched. Sodium hydroxide, or lye, breaks down animal and plant tissues. It is used to make soap, paper,

and artificial fibers. When water is combined with a base the result is called a basic, or alkaline, solution.

Acid-Base Reactions

When acids and bases are combined they produce water and compounds called salts. They have a salty taste and none of the characteristic properties of either acids or bases. The reactions between acids and bases can be quite strong. One result is that they can quickly produce gases. This is why baking soda is useful for baking pastries and cakes. When it is combined with an acid such as lemon juice or sour cream in a dough mixture, it releases gases that make the dough rise.

Identifying Acids and Bases

Acids and bases make some materials change color. A special kind of paper called litmus paper is one type of mate-



A strip of litmus paper shows that a solution contains an acid. If the solution contained a base the paper would have turned blue.

rial that does this. An acid in water turns litmus paper red. A base in water turns the paper blue. A neutral substance, such as pure water, gives litmus paper a color midway between red and blue.

Acid Rain

Acid rain is a form of air pollution. When coal and petroleum are burned in automobiles, electric power plants, and factories, they release certain harmful gases into the air. These gases combine with the oxygen and water in the air. When the water in the air comes down as rain, sleet, hail, or snow, it carries with it these gases. This is known as acid rain. Acid rain is very damaging to all life forms.

Acid rain can pollute lakes and streams, killing the fish and other organisms that live in them. Acid rain also damages various kinds of vegetation, including farm crops and trees. In addition, acid



Acid rain can be very damaging to trees and other plants. The branch on the left has been affected by acid rain. It looks much different than the branch on the right.

rain corrodes, or wears away, surfaces of buildings and other structures.

By the early 1990s tens of thousands of lakes had been destroyed by acid rain. The problem has been most severe in Norway, Sweden, and Canada. Damage from acid rain is not limited to the countries that produce the pollution. This is because winds carry the pollution around the globe.

Despite much discussion between many countries, there is still no clear solution to the problem. The chief reason is that it is expensive to control the pollution. However, since the damage from acid rain to the environment is permanent, the environmental costs are greater.

Acne

Most teenagers and some adults experience a skin condition called acne. Some cases of acne are very mild and go away without leaving any signs. Others are more serious and may cause scarring. Boys are more likely than girls to have severe acne.

Lesions (abnormal bumps or spots) on the skin are the main symptom of acne. Acne lesions are commonly known as pimples. They occur especially on the face and neck.

Acne is caused by changes inside the body that affect the skin. These changes occur naturally as a boy or girl reaches puberty, or matures. At that time the body produces more of chemicals called



Bumps called pimples are the main sign of acne.

hormones. Some of those hormones speed up the skin's production of oil. The extra oil clumps together with dead skin cells to clog pores, or tiny openings in the skin. As the oil gland under a clogged pore makes more oil, the pore swells up to form a pimple.

There is very little a person can do to prevent acne. However, there are treatments for clearing up acne and ways of preventing acne from getting worse.

Washing the skin twice a day with a mild soap can be helpful. This removes some oil and dead skin cells that help to clog skin pores.

In some cases a doctor may prescribe medicine to treat infections caused by acne. Doctors may also suggest medi-

cated lotions or creams that can be put on the skin.

► More to explore

Hormone • Skin

Acropolis

Ancient cities were often built around a fortress on top of a hill. When a city spread to the area below, the high part came to be called the acropolis, which means "city at the top" in Greek. The best-known acropolis is in Athens, Greece.

The buildings of the Athens Acropolis were made mostly of white marble. Parts of some of the buildings, including a temple called the Erechtheum, are still standing today. The Erechtheum had a porch with marble columns in the shape of female figures.

The most famous surviving building is the Parthenon. The Parthenon was built almost 2,500 years ago and was dedicated to the goddess Athena. Athens was later ruled by Christians who made the



The ruins of the Parthenon stand out on the Acropolis in Athens, Greece.

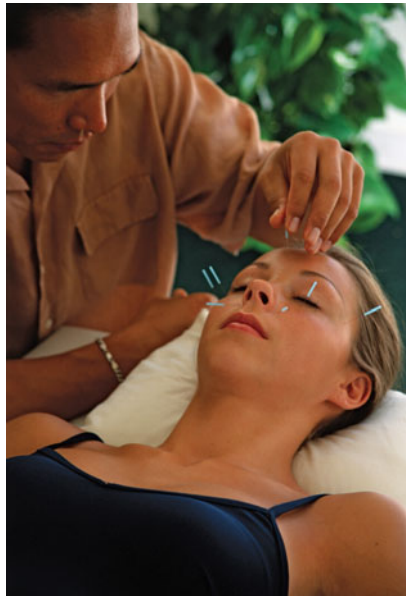
Parthenon a church. In the 1400s Turkish forces took control of the Acropolis and made the Parthenon an Islamic mosque. In 1687, during a war, some gunpowder stored there exploded, destroying the middle of the building.

In 1801 a British diplomat named Lord Elgin took many sculptures and carved panels from the Parthenon and brought them to England. They were put on display at the British Museum. The Greek government, however, asked for their return to Greece. The sculptures remained on display while the dispute continued into the 21st century.

► More to explore

Athena • Athens

Acupuncture



A woman receives an acupuncture treatment.

Acupuncture is an ancient Chinese form of healing. It involves piercing the skin with thin needles to relieve pain. Today

acupuncture is also popular in Europe, the Americas, and Australia.

Modern doctors accept that acupuncture can control pain and nausea. Some doctors recommend acupuncture along with regular medical treatments for such ailments as asthma, high blood pressure, indigestion, and stress. Doctors in China have even used acupuncture instead of drugs to stop pain during surgery.

People who practice acupuncture must take courses to learn how to do it correctly. In many places only medical doctors may perform acupuncture.

During treatment the patient lies on a table while the acupuncturist sticks special needles into certain points on the body. The needles are made of metal and are about as thick as a human hair. They normally go less than 0.5 inch (1 centimeter) into the skin. There are hundreds of possible points where the needles can be stuck, each with a different effect.

Doctors are not sure how acupuncture works. Some think that the needles cause the body to produce pain-killing chemicals. Others think that the needles block pain signals from traveling along the nerves to the brain. Some think that acupuncture acts like a placebo—a treatment that works only because patients believe it will.

Adams, Abigail

Abigail Adams was the wife of President John Adams and the mother of Presi-



Abigail Adams

dent John Quincy Adams. Her reading and her family life gave her a good understanding of politics. She strongly favored American independence and universal liberty. She was also determined to overcome the limits that were placed on women at the time.

Abigail Smith was born on November 22, 1744, in Weymouth, Massachusetts. As a girl she studied the books in her father's large library. Women could not go to college then, but Abigail received a good education at home.

In 1759 Abigail met the young lawyer John Adams. They shared interests in reading, writing, and politics. They married in 1764 and settled on a farm in Braintree (now Quincy), Massachusetts. They had five children. Abigail, John Quincy, Charles, and Thomas survived to adulthood.

John Adams' law practice and political duties kept him away from home much of the time. Abigail Adams stayed in touch with her husband and other

family members by letter. Her letters are full of her opinions on the important issues of the day. This was during the time when the American colonies began to fight for independence from Great Britain. She wrote in favor of American independence. Like her husband, she also believed that slavery had no place in a country dedicated to freedom.

In 1789 John Adams became the first vice president of the United States. Eight years later he became the second president. Even during those terms Abigail was often in Massachusetts running the family farm. In 1800, however, she moved with the president into the White House, which was unfinished at the time.

After Adams' term as president he and Abigail returned to Quincy and settled comfortably into retirement. Abigail died on October 28, 1818.

► More to explore

Adams, John • Adams, John Quincy
• American Revolution • White House

Adams, Ansel

U.S. photographer Ansel Adams is famous for his striking images of Western landscapes. He was among the first people to promote photography as an art form. Adams also was known for his love of nature.

Ansel Adams was born in San Francisco, California, on February 20, 1902. He was originally a student of music. Photography was only a hobby for him until

Did You Know?

Abigail Adams supported womens' rights. She told her husband John Adams to "remember the ladies" during the fight for U.S. independence.

1927. That year he published his first collection of photographs.

In 1940 Adams helped found the world's first museum collection of photographs at the Museum of Modern Art in New York City. In 1946 he established the first academic department to teach photography as a profession. He did that at the California School of Fine Arts in San Francisco.

Adams was a nature lover throughout his life. He published many collections of photographs that he took in the wilderness areas of the United States. They include *My Camera in the National Parks* and *Photographs of the Southwest*.

In 1980 Adams was awarded the Presidential Medal of Freedom, the highest nonmilitary honor in the United States. He died on April 22, 1984, in Carmel, California.



Ansel Adams prepares to take a photograph along the coast of California.

Adams, John



John Adams was the second president of the United States.

As a lawyer in the American colonies, John Adams fought for independence from Great Britain. He went on to become the first vice president and the second president of the new United States.

Early Life

John Adams was born in Braintree (now Quincy), Massachusetts, on October 30, 1735. His father was a farmer and a community leader. After graduating from Harvard College in 1755, Adams became a lawyer. In 1764 Adams married Abigail Smith. They had five children. One daughter died in infancy.

Revolutionary Era

Adams became a leader in the fight against British laws in the colonies. Still,



TIMELINE

Adams is born in Braintree (now Quincy), Massachusetts.

October 30, 1735

Adams joins the Continental Congress.

1774

Adams helps create the Treaty of Paris, which ends the American Revolution.

1783

Adams becomes vice president under President George Washington.

1789

Adams is elected president.

1796

Adams loses the presidency to Thomas Jefferson.

1800

Adams dies in Quincy, Massachusetts.

July 4, 1826

as a lawyer, Adams defended British soldiers who had killed five colonists in the Boston Massacre of 1770. This made him unpopular for a time among the other colonists. But Adams believed that everyone's legal rights should be protected.

In 1774 Massachusetts' colonists elected Adams to the Continental Congress. There he asked George Washington to serve as commander of the Continental Army, the military force of the colonies during the American Revolution. He also chose Thomas Jefferson to write the Declaration of Independence.

In 1779 Adams served at the Massachusetts Constitutional Convention. He wrote the document that became the state's constitution of 1780. Adams then joined Benjamin Franklin in Paris, France. There he helped to produce the Treaty of Paris, which ended the American Revolution.

Vice Presidency

In 1789 Adams finished second to George Washington in the presidential election. Under the system of the time, Adams became vice president. Voters reelected the two men in 1792.

Political parties began to form during Washington's presidency. Adams and Alexander Hamilton led the Federalists, who supported a strong central government. They opposed the Democratic-Republicans, led by Jefferson, who wanted the states to have more power.

Presidency

Adams won a narrow victory over Jefferson in the election of 1796. Adams was not a popular president. He followed his own principles instead of others' opinions. Adams even disagreed with other Federalists, notably Hamilton.

During Adams' presidency a dispute between the United States and France

Did You Know?

John Adams was the first president who lived in the White House. He moved in on November 1, 1800.

almost led to war. The French had expected the United States to support them in their war with Britain. The United States refused, and the French began seizing U.S. ships. Hamilton and others called for war with France. Adams, however, thought the United States was not ready for another war. Going against his party, he made peace with France.

Adams faced more criticism for the passage of the Alien and Sedition Acts in 1798. Those harsh laws made it more difficult for new immigrants to stay in the country. They also punished critics of the government.

Defeat and Death

Adams lost to Jefferson in the presidential election of 1800. Adams died within hours of Jefferson on July 4, 1826, the 50th anniversary of the signing of the Declaration of Independence.

► More to explore

American Revolution • Continental Congress • Hamilton, Alexander • Jefferson, Thomas • United States

Adams, John Quincy

Son of President John Adams, John Quincy Adams became the sixth president of the United States in 1825. Although he was intelligent and dedicated to his country, Adams was not very popular. His accomplishments as a diplomat and congressman overshadowed his uneventful presidency.



John Quincy Adams was the sixth president of the United States.

Early Life

John Quincy Adams was born on July 11, 1767, in Braintree (now Quincy), Massachusetts. He grew up during the American Revolution. His father was a member of the Continental Congress. His mother, Abigail Adams, also was a patriot. Adams studied in Europe and in Massachusetts at Harvard College. After graduating in 1787, he studied law and became a lawyer in Boston.

In 1797 Adams married Louisa Catherine Johnson. The couple had four children, a daughter and three sons. One of their sons, Charles Francis Adams, became a member of the House of Representatives and a diplomat.

Early Career

In 1794 President George Washington made Adams the U.S. minister to The



TIMELINE

Adams is born in Braintree (now Quincy), Massachusetts.

July 11, 1767

1803

Adams is elected to the U.S. Senate.

President James Monroe makes Adams secretary of state.

1817

1824

Adams is elected the sixth president of the United States.

Adams loses the presidential election to Andrew Jackson.

1828

1831

Adams enters the U.S. House of Representatives.

Adams dies in Washington, D.C.

February 23, 1848

Netherlands. In 1797 Adams' father, now president, made Adams ambassador to Prussia. In 1802 Adams was elected to the Massachusetts Senate. In 1803 he was elected to the U.S. Senate. After five years he resigned from the Senate to practice law.

In 1809 President James Madison appointed Adams minister to Russia. In 1815 Adams became minister to Great Britain. He returned to the United States in 1817 and became secretary of state under President James Monroe. In that role Adams helped persuade Spain to give control of Florida to the United States. He also helped create the Monroe Doctrine, a warning to European countries not to extend their power in the Western Hemisphere.

Presidency

In 1824 Adams was one of four candidates for the presidency. Andrew Jackson received the most electoral votes, fol-

lowed by Adams. No one had a majority of the votes, however, so the House of Representatives had to pick the winner. The House chose Adams. He took office in 1825.

The country prospered during Adams' presidency, but he was not a successful leader. He wanted to create a national university and expand the country's roads. However, Jackson's supporters in Congress blocked most of Adams' bills. In the election of 1828 Adams lost to Jackson.

Later Career and Death

Adams retired in 1829, but his retirement was brief. In 1830 Massachusetts elected him to the House of Representatives. In Congress Adams argued against the expansion of slavery. He also helped start the Smithsonian Institution, which today runs several museums in Washington, D.C. Adams suffered a stroke in 1848 while speaking in the House. He

died in the Capitol two days later, on February 23, 1848.

► **More to explore**

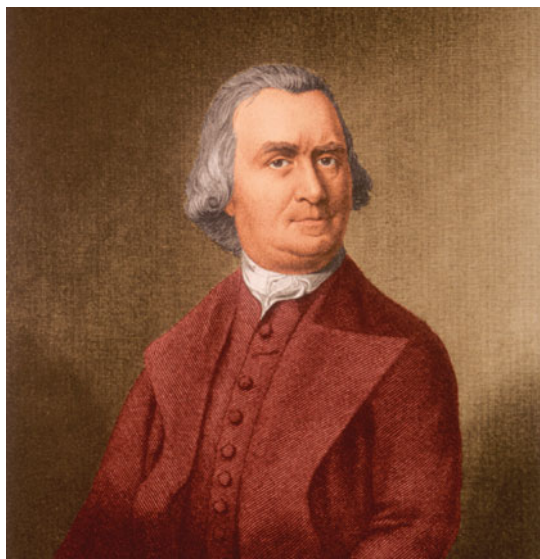
Adams, John • Jackson, Andrew
• United States

Adams, Samuel

A strong attachment to the cause of independence made Samuel Adams a leader of the American Revolution. As a politician and as a writer he stirred the colonists against British rule.

Samuel Adams was born in Boston, Massachusetts, on September 27, 1722. His second cousin was John Adams, the second president of the United States. Sam graduated from Harvard College in 1740 and soon entered local politics.

In the 1760s Adams led protests against the British, who ruled the colonies at the time. He served in the Massachusetts legislature from 1765 to 1774. In 1772 he helped organize a “committee of cor-



Samuel Adams

respondence.” This was a group that coordinated anti-British activity.

Adams was among the first to call for complete independence for the American colonies. As a member of both Continental Congresses, he said that Americans must be ready to fight. In 1776 he signed the Declaration of Independence. In 1794 Adams was elected governor of Massachusetts. He died on October 2, 1803.

► **More to explore**

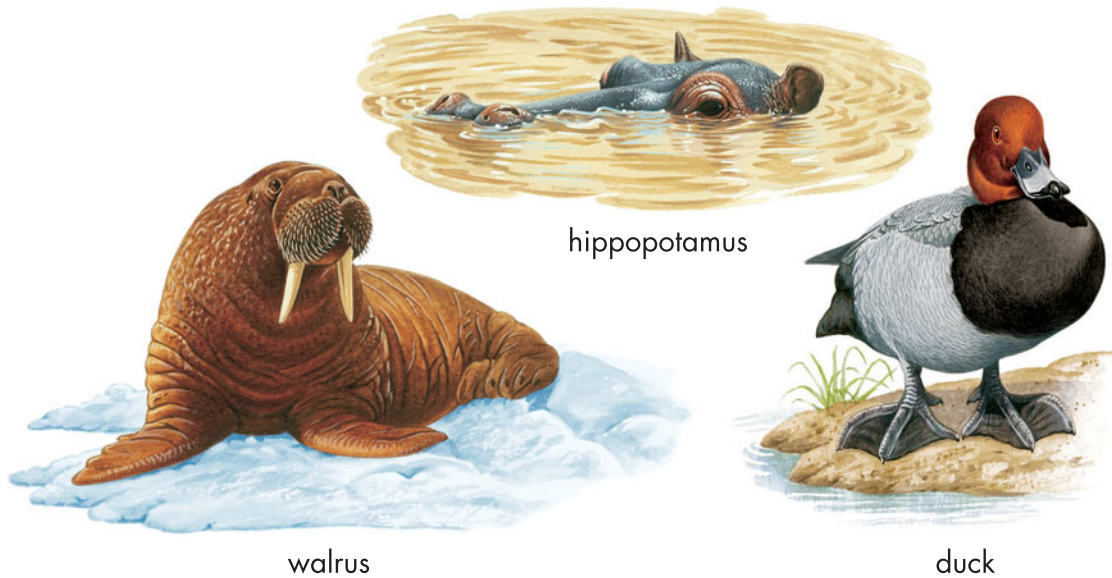
Adams, John • American Revolution
• Continental Congress • Declaration of Independence

Adaptation

Plants and animals have special characteristics, or traits, that help them survive in their surroundings. They develop these traits through a process called adaptation.

Many animals have traits that help them hide from other animals that want to attack them. Some insects look like a leaf or a twig. Deer are colored shades of brown, like the trees in the forests where they live. In both cases, these animals become almost invisible to their predators, or attackers, because they blend in with their surroundings.

Other animals have features that help them deal with some part of their surroundings. Frogs, alligators, and hippos all spend a great deal of time in the water. They all have their eyes and nostrils near the top of the head. This



walrus

hippopotamus

duck

Many animals have developed features to help them survive in their habitat. Hippopotamuses' eyes and nostrils are on the top of the snout. This allows them to spend a lot of time almost completely underwater. Ducks have webbed feet to help them swim. Walruses have thick skin to protect against the cold.

means that the animal may remain almost completely underwater and yet be able to see and breathe. Water birds have webbed feet to help them paddle in the water. Cactus plants, which live in dry places, can store a lot of water. A cactus has thick skin and a waxy surface. This keeps the plant from losing water through evaporation.

Organisms with helpful traits tend to thrive, to reproduce, and to pass those traits on to their own offspring. Similar organisms that do not have these traits do not survive as well and do not have as much chance to reproduce. Therefore the helpful traits are passed on and eventually become permanent. This process is called natural selection. It is part of the process of evolution.

► More to explore

Animal • Evolution • Plant

Addams, Jane



Jane Addams

The social worker Jane Addams devoted her life to helping the poor and promoting world peace. She founded Hull House to serve needy immigrants in Chicago, Illinois. It was one of the first agencies of its kind in North America.

Jane Addams was born on September 6, 1860, in Cedarville, Illinois. She gradu-

ated from college in 1882 and then went to Europe. In a poor section of London, England, she visited Toynbee Hall. University graduates lived there and worked to improve life in the neighborhood. It was known as the world's first social settlement. Addams took this idea back to the United States.

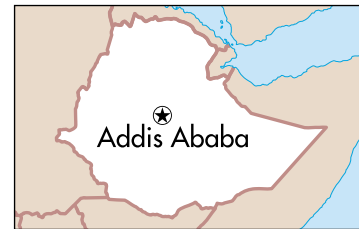
In 1889 Addams and a classmate, Ellen Gates Starr, rented a big house in Chicago. They moved in and opened the house to immigrants who were trying to succeed in their new country. Addams and Starr called their social settlement Hull House after its builder, Charles Hull. Hull House workers started a day care center, a kindergarten, a gymnasium, and an employment agency. They taught many kinds of classes and even set up a theater. All these programs eventually filled 13 buildings.

Addams became involved in many social causes. She worked to pass laws against child labor, to protect workers' rights, and to win women the right to vote. Addams believed that countries should settle their disagreements peacefully. She spoke out against World War I even though her opinion made her less popular. In 1931 she won a share of the Nobel peace prize.

Addams lived at Hull House until her death on May 21, 1935. The original Hull mansion has been preserved as a museum that honors her.

► **More to explore**
Chicago

Addis Ababa



Population
(2006 estimate)
2,973,000

Addis Ababa is the capital and largest city of the East African country of Ethiopia. It is situated on a plateau high in the central mountains of Ethiopia.

Ethiopia's government ministries and houses of parliament are located in Addis Ababa. The city also contains the headquarters of the African Union.

Most of Ethiopia's trade passes through Addis Ababa. In the western part of the city is the Mercato. It is one of the largest open-air markets in Africa. Goods manufactured in the city include textiles, food, beverages, plastics, and wood products.

Addis Ababa became the capital of Ethiopia in the late 1800s. Before that



Worshippers gather at an Ethiopian Orthodox church in Addis Ababa.

the capital was Entoto, a cold, wind-swept town just to the north. In 1887 the empress Taitu persuaded her husband, Emperor Menelik II, to move the capital to its present site.

From 1935 to 1941 Italian forces occupied Addis Ababa as well as the rest of Ethiopia. The Italians paved roads and constructed European-style buildings. Development of the city was slow from 1941 until 1960. Beginning in the 1960s, however, Addis Ababa grew rapidly in population.

► More to explore

Ethiopia

Adena Culture

The ancient Native Americans of the Adena culture lived in a large area centered in what is now southern Ohio. The Adena people thrived from about 500 BC to AD 100. They are known mostly for the earthen mounds they built. The term Adena comes from the name of a place where archaeologists found Adena mounds in the early 1900s.

The Adena settled in hundreds of small villages along the Ohio River. They lived in cone-shaped houses and fed themselves by hunting, fishing, and gathering fruits and wild plants. They made tools from wood, bone, and copper. They also wove cloth and molded simple pots from clay.

The Adena constructed hundreds of earthen mounds in the area that now



The largest burial mound of the Adena culture can be seen in what is now northern West Virginia. It was built more than 2,000 years ago.

makes up Ohio, Indiana, Kentucky, West Virginia, and Pennsylvania. Many of the mounds were burial sites. The Adena built many mounds in simple shapes such as circles and rectangles. They shaped other mounds like animals. The most famous is the Great Serpent Mound near Peebles, Ohio. This mound looks like a giant snake and is nearly 1,300 feet (400 meters) long.

No one knows for sure what happened to the Adena people after about AD 100. Some scientists think that they joined the Hopewell people, who developed a similar culture in the territory where the Adena had lived.

► More to explore

Hopewell Culture • Native Americans

Adobe

Adobe is a type of clay that is used to make bricks. People in many dry parts



The buildings of Taos Pueblo in New Mexico are made of adobe. Some have been lived in for more than 1,000 years.

of the world use adobe bricks to build buildings. This is partly because there are few trees in these regions to supply wood for building.

People make adobe bricks by wetting clay and then adding straw or another type of fiber. They mix the material and pour it into molds. The molds have four sides and are open at the top. People then lay the bricks out in the sun to dry, which can take several weeks. When they are dry, the adobe bricks are ready to use.

Adobe buildings usually start with a base of stone or concrete. Workers stack the adobe bricks on this base. They stick the bricks together with a mudlike material called mortar. Adobe buildings are very strong and last for hundreds of years. Adobe buildings also stay warm in winter and cool in summer.

People have used adobe for thousands of years. Ancient peoples east of the Medi-

terranean Sea, in North Africa, and in southern Spain made adobe bricks. American Indians in the driest parts of North and South America also built with adobe. For example, the Pueblo Indians built many adobe houses in what is now the southwestern part of the United States.

► More to explore

Clay • Pueblo Indians

Adolescence

Adolescence is the time in a young person's life between childhood and adulthood. Adolescence starts when a person is about 12 years old and ends at about the age of 19. A person in this age group is called an adolescent, or a teenager.

Adolescence is a time of great change. Adolescents experience changes in their bodies. They also experience changes in their emotions, or feelings, as well as their thoughts and beliefs. They often see the world differently, and they act differently than they did when they were children.



Relationships with their friends are very important to most adolescents.

Changes in the Body

During adolescence, the reproductive system develops. The reproductive organs are the parts of the body that allow men and women to make babies. Girls' and boys' bodies change in different ways. Boys grow facial hair, and their voices deepen. They also develop stronger muscles. Girls grow breasts and wider hips, and they start having menstrual periods. This means that they are able to become pregnant.

Emotional Changes

Adolescence is an exciting time. It is also a time that can be very confusing. Boys and girls become much more interested in each other. At the same time they may worry about their appearance, and they are sometimes easily embarrassed. During adolescence, most boys and girls care a lot about what other adolescents think of them. They may also be very concerned with how they fit into their world. Often adolescents choose to spend time with their friends rather than with their families.

Growing Independence

As adolescents grow emotionally, they begin to take on new responsibilities and gain new freedoms. They act and think more independently. They also start to find a balance between family and friends. These changes mean that adolescents are on their way to becoming adults.

► More to explore

Child Development • Reproductive System

Adriatic Sea



The Adriatic Sea separates Italy from the Balkan Peninsula of eastern Europe. It was probably named after the port town of Adria, which prospered during ancient Roman times.

The Adriatic is about 500 miles (800 kilometers) long and has an average width of 100 miles (160 kilometers). Its maximum depth is 4,100 feet (1,250 meters). The sea has a high salt content. The climate is Mediterranean. This means that it has clear, warm, and dry summers and mild, humid winters.

The Adriatic extends from the Gulf of Venice, in the north, southeastward to the Strait of Otranto, which leads to the Ionian Sea near Albania. Its western, or Italian, coast is low and straight. The eastern coast is rocky and mountainous. The countries of Slovenia, Croatia, Bosnia and Herzegovina, and Montenegro border the sea to the east.

The Adriatic is an important part of tourism in the region. Many holiday

Did You Know?

Bosnia and Herzegovina's seacoast on the Adriatic is only 12 miles (20 kilometers) long.

resorts are located on its shores. The fishing catch on the Adriatic includes lobsters, sardines, and tuna.

Advertising

Whenever people give information to the public about an event, a product, or a service, they are using advertising. A piece of advertising is called an advertisement, or ad.

The goal of most advertising is to make the public want to buy whatever is being advertised. People also use advertising to make the public form opinions about things. For example, an ad could try to make the public believe that a company treats its workers well. Another ad could try to make voters choose a certain candidate for president.

Ads appear almost everywhere. They are found in newspapers and magazines. They appear on television, radio, and

the Internet. Ads are also posted as signs in all kinds of public places.

The Media and Advertising

When advertisers want many people to see or hear their ads, they pay the media to have the ads published or broadcast. Newspapers and magazines publish, or print, ads between their articles. Television and radio networks broadcast, or play, ads during their programs. (Television and radio ads are also called commercials.) Web sites, buses, movie theaters, and many other places also display ads in exchange for money.

Control of Advertising

Advertisers are regulated, or controlled, in several ways. Governments usually pass laws to make sure that ads are truthful and do not offend consumers. Also, the media usually set their own rules that advertisers must follow.

History of Advertising

Signs were the first form of advertising. Even thousands of years ago people created hand-lettered signs to advertise their goods and services. The invention of the printing press in the 1400s expanded this type of advertising. Merchants could print dozens of the same posters and fliers to advertise what they were selling. In the 1600s and 1700s newspapers appeared in Europe, the Americas, and Japan. Advertising then became even more widespread.

Today advertising is a huge part of business around the world. A major corpora-



Bright advertisements compete for attention in New York City.

tion may spend hundreds of millions of dollars a year just on advertising.

► More to explore

Magazine • Newspaper • Radio
• Television

Aegean Civilization

The earliest European civilization arose sometime after 3000 BC, in the region of the Aegean Sea. It took place on the islands and the mainland of what is now the country of Greece. This civilization went through several stages. It began on the island of Crete. That early part is now called the Minoan civilization. On the mainland of Greece it developed later. That is now called Mycenaean civilization.

Minoans

The Minoan civilization lasted from about 2500 BC to about 1400 BC. The Minoans are named for their legendary

king Minos. Their capital city was Knossos. The palace at Knossos was enormous, covering 5.5 acres (2.2 hectares) of ground. Large towns spread around other Minoan palaces. Houses were often two stories high. They were built with stones, timber, and mud bricks.

The Minoans painted their pottery and walls with images of plants, flowers, animals, and goddesses. They worshipped a mother goddess.

The wealth of the Minoans was based on seafaring and trading, especially trade with the Middle East and Egypt. Pottery made on Crete has been found in Egypt, and ancient Egyptian pottery has been found on Crete. A powerful navy protected Knossos.

Mycenaeans

The Mycenaean civilization developed in the 1500s BC, when Greek-speaking people settled down on the Greek mainland. The Mycenaeans conquered the Minoans in about 1400 BC. Their civilization is named after Mycenae, its most important city.

A king headed the society. Kings built fortresses with strong walls. This was because the Mycenaeans fought many wars, including—according to legend—the Trojan War. There were also landowners, farmers, slaves, and priests. Like the Minoans, the Mycenaeans decorated their walls with paintings. They were skilled jewelers and goldsmiths.

Mycenaean trade extended to Sicily, Egypt, Palestine, Troy, Cyprus, and

Did You Know?

Ancient Greek mythology tells of the Minotaur, a fierce monster of the Minoan kingdom. The Minotaur had the body of a man and the head of a bull.



The throne room of the palace in Knossos still holds the throne of the ancient Minoan kings.

Macedonia. The Mycenaeans imported food, cloth, and copper. They probably exported woolen goods, olive oil, timber, and silver.

The Mycenaeans adopted the Minoan system of writing on clay tablets. Unlike the Minoan language, however, the Mycenaean language has been translated. It is the oldest known form of Greek.

Toward the end of the 1200s BC, the Mycenaean civilization fell apart. Many people moved away to other lands. Scholars think that the decline may have been due to drought, bad harvests, lack of food, disease, or anger about the high taxes the people had to pay.

In about 1100 BC Greece was taken over by tribes from the north. These peoples were the ancestors of the modern Greeks. It is with them that the history of ancient Greece began.

► More to explore

Aegean Sea • Greece • Greece, Ancient

Aegean Sea

An arm of the Mediterranean Sea, the Aegean Sea lies between the countries of Greece and Turkey. The region was the site of two great ancient civilizations, those of Crete and Greece.

The Aegean Sea is about 380 miles (610 kilometers) long and 185 miles (300 kilometers) wide. In the northeast it connects to the Black Sea through a series of narrow straits. The sea has hundreds of islands stretching from Greece



to the shores of Asia. The islands are actually the mountain peaks of an underwater landmass called Aegeis.

The Aegean contains few nutrients so very little plant life grows there. Its warm waters, however, encourage fish to enter it from the Black Sea to breed.

The chief products of the islands are wheat, wine, oil, figs, raisins, honey, vegetables, marble, and minerals. Fishing and tourism are also important. Visitors come to see the villages of whitewashed houses as well as the ruins of ancient civilizations.



The clear blue waters of the Aegean Sea lap at the shores of a beach in Greece.

Scientists believe that people began to explore the Aegean about 15,000 years ago. By the 1st century BC the Roman Empire ruled over the area of the Aegean and the Mediterranean. The region later came under the control of the Byzantine Empire, the Ottoman Empire, and finally the independent country of Greece.

► More to explore

Aegean Civilization • Greece

Aesop

Hundreds of stories called fables are credited to a person named Aesop. Ancient scholars claimed that Aesop lived in the kingdom of Thrace in the 500s BC. It is now known that many of the stories are even older and that Aesop probably never existed. But the fables that are credited to him are still used to teach children.

The fables of Aesop were probably part of an oral history—stories that were told aloud. About 2,000 years ago the Roman writer Phaedrus wrote down some of the fables. Later the stories were translated into other languages. An early English-language version of the stories was published in 1692. The fables familiar to readers today were translated into English during the 1800s. Most of the fables are about animals with human characteristics. Most end with a moral, or a statement of the lesson that the fable teaches.

► More to explore

Fable • Folktale



In Aesop's fable of "The Hare and the Tortoise," a speedy hare teases a tortoise about his slow pace. The tortoise challenges the hare to a race. The hare is so sure that he will win that he takes a nap. When he wakes up, the tortoise has already won. The moral is "Slow but steady wins the race."



Afghanistan

The country of Afghanistan lies at the heart of central Asia. The capital is Kabul.

Geography

Afghanistan borders Iran, Pakistan, Turkmenistan, Uzbekistan, and Tajikistan. The Amu Darya river forms part of the northern border. A narrow piece of land called the Vakhn, or Wakhan Corridor, connects Afghanistan with China.

Afghanistan is a mountainous country. The main range is the Hindu Kush, in the northeast. North of the central mountains are fertile plains. Deserts, including the sandy Rigestan, lie in the southwest. Afghanistan generally has a dry climate with cold winters and hot summers.

Plants and Animals

Southern Afghanistan has little vegetation. Cedar, oak, walnut, alder, and ash

trees grow in the north. The mountains have forests of pine and fir.

Wolves, foxes, hyenas, jackals, bears, and wild goats roam the mountains.

Gazelles, wild dogs, and wild cats are widespread. The country's birds include vultures and eagles.

People

The people of Afghanistan, known as Afghans, are a mixture of many different groups. The Pashtuns make up about half of the population. Tajiks make up about a fifth of the population. Other ethnic groups include the Hazara, Uzbeks, Chahar Aimaks, and Turkmen. Pashto, the language of the Pashtuns, and Dari (Persian) are the two official languages, but others are spoken. Almost all Afghans are Muslims.

Kabul is the largest city, but most Afghans live in rural areas. Farmers live in villages along the rivers. Nomads live in tents and move from place to place. Few people live in the mountains or the deserts.

Economy

Afghanistan is one of the poorest countries in the world. Most people grow crops and raise animals for their own use. The main food crops are wheat, rice, grapes, barley, and corn. Sheep, goats, and cattle are the main livestock. Some farmers grow opium poppies, which are used to make illegal drugs.





The blue-tiled mosque in Mazar-e Sharif, Afghanistan, is important to all Muslims. It marks the tomb of 'Ali, the son-in-law of the prophet Muhammad.

Manufacturers make processed foods, leather, fur, and textiles. The country has deposits of natural gas, but warfare has prevented Afghans from using them.

History

Major trade routes crossed what is now Afghanistan thousands of years ago. The Persians and Macedonian king Alexander the Great ruled the land more than 2,300 years ago. In the AD 600s Arab invaders introduced the religion of Islam. In 1219 Genghis Khan made the area part of his Mongol Empire. Beginning in the 1300s Turkic peoples, the Mughal Empire, and the Persians ruled parts of the land.

Ahmad Shah Durrani, a Pashtun leader, unified Afghanistan under his rule in 1747. Great Britain invaded in the

1800s. After winning independence from Britain in 1919, Afghanistan continued as a monarchy. In 1973 Afghans overthrew the king. The country's new leaders made Afghanistan a republic, led by a prime minister.

Soviet Invasion

In 1978 Communists seized control of Afghanistan's government. The Soviet Union invaded in December 1979. For nearly a decade Islamic forces known as mujahideen fought the Soviets. Millions of Afghans left the country for Pakistan and Iran. The Soviet Army left in 1989.

The Taliban

Various Afghan groups then fought for control. By the late 1990s a group called the Taliban had gained control over most of Afghanistan. The Taliban ruled according to a strict version of Islamic law.

The Taliban angered other countries by allowing terrorists to live in Afghanistan. When the Taliban refused to hand over suspected terrorist Osama bin Laden, the United States and its allies bombed Afghanistan in October 2001. Within months the Taliban abandoned Kabul. In 2004 Afghanistan adopted a new constitution and elected a president. But fighting continued between U.S. forces and the Taliban.

► More to explore

Alexander the Great • bin Laden, Osama
• Communism • Islam • Kabul
• Mongol Empire • Mughal Empire
• Persia • Union of Soviet Socialist Republics

Facts About AFGHANISTAN



Population
(2008 estimate)
28,266,000

Area
249,347 sq mi
(645,807 sq km)

Capital
Kabul

Form of government
Islamic republic

Major cities
Kabul, Kandahar (Qandahar), Herat, Mazar-e Sharif

Africa

Africa is the world's second largest continent. More than 50 countries make up the continent. More than one eighth of the world's population lives there.

Land and Climate

Africa's landscape is varied. The northern and western parts of the continent are generally lower and more level than the eastern and southern areas. Africa is the oldest continent. Therefore most of its mountains are not as high as those on other continents. They have been worn down over millions of years by wind and water.

Africa's most striking feature is a series of great rifts, or troughs, in the east known as the Rift Valley system. These rifts span two continents, from western

Asia through eastern Africa. In Africa they are deep, long, narrow valleys.

The world's longest river, the Nile, flows through northern Africa. The continent's other long rivers include the Congo in central Africa, the Niger in the west, and the Zambezi in the south. Eastern Africa has a chain of lakes known as the great lakes.

The continent is crossed midway by the equator. This means that most of Africa—the middle portion—lies within the tropics, an area where it is hot year-round. In the lowlands near the equator, rain falls throughout the year. To the north and south of this rainy area are large regions that have a rainy season followed by a dry season. It is very hot



A pair of giraffes is at home near Mount Kilimanjaro in Tanzania.



and dry year-round in Africa's major deserts—the Sahara in the north and the Kalahari and the Namib in the south.

Plants and Animals

The vegetation growing in each region depends on the rainfall it receives. Near the equator, where it rains year-round, there are dense rain forests. These forests contain thousands of different types of trees and other plants. Between the rain forests and the great deserts to the north and south are the savannas. These are open grasslands scattered with trees such as acacias and baobabs. Few plants grow in the deserts.

A serious problem in the savanna is that the vegetation is being used up, leaving the land bare. As the population increases, more and more of the trees are being used for fuel and for building supplies. Some scientists are concerned that removing the vegetation may cause the savanna to become more desertlike.

Africa has many different kinds of animals, though their numbers were greatly reduced in the 1900s. This loss occurred because of overhunting and because large areas of their natural habitats were taken over for farming. Today many species are threatened with extinction. Several countries have set aside land to help protect wild animals. These wildlife preserves are home to such animals as elephants, giraffes, zebras, hippopotamuses, antelopes, lions, jackals, and hyenas. The rain forests support monkeys, bats, flying squirrels, gorillas, leopards, and mongooses. The native animals of northern Africa include types

of wild sheep and goat, the African red deer, and the jerboa (a small leaping animal like a gerbil). Fish, birds, and reptiles also are abundant.

People

Africa has the most physically varied population in the world. Most of the population consists of black peoples belonging to almost 3,000 different ethnic groups. In the north there are also large numbers of Arabs. Mainly in the south there are some descendants of Europeans who established colonies in Africa hundreds of years ago.

The number of languages spoken in Africa probably exceeds 1,000, though some are spoken by only a small number of people. Arabic is the major language of northern Africa. Most Africans who live south of the equator speak one of the many Bantu languages. In general, Islam is the religion of northern Africa



South African boys pose in front of a painting in Cape Town, South Africa.

and Christianity of southern Africa. Traditional religions are also practiced.

Many African countries are comparatively poor. In all African countries the government provides public education. But most governments cannot afford to provide education for everyone. Millions of Africans remain unable to read or write. Much of the money for health care comes from other countries. Infectious diseases, such as malaria, continue to be a serious problem in Africa, and about 70 percent of all AIDS cases are in Africa.

Economy

Most of Africa is underdeveloped. But the continent has some of the world's largest shares of minerals, including oil, natural gas, and coal; metals such as gold; and gems such as diamonds.

Farming is a very important part of the African economy. The chief food crops vary by region. They include yams in the tropical forests of the west; corn, millet, and rice in the savannas; and corn in the south. The tropical grasslands are also suitable for cattle farming. Most African countries do not produce enough food to feed all their people. Therefore they must import food.

In many parts of Africa certain crops are produced for sale to other countries. Africa is the world's largest supplier of cocoa beans, which are used in making chocolate. Africa also exports much cotton, sisal (a fiber), tea, coffee, palm oil, yams, and peanuts, as well as wood from the forests.

Facts About AFRICA

Area

11,678,801 sq mi (30,247,722 sq km)

Population

(2008 estimate) 955,761,100

Largest Country by Area

Sudan: 966,757 sq mi (2,503,890 sq km)

Smallest Country by Area

Seychelles: 176 sq mi (455 sq km)

Largest Country by Population

Nigeria: (2008 estimate) 146,255,000

Smallest Country by Population

Seychelles: (2008 estimate) 85,500

Largest Cities

Cairo, Egypt; Lagos, Nigeria; Johannesburg, South Africa; Kinshasa, Congo; Khartoum, Sudan

Longest River

Nile River: 4,132 mi (6,650 km)

Largest Lake

Lake Victoria: 26,828 sq mi (69,785 sq km)

Although Africa still earns most of its money by exporting raw materials and food, many of its countries are developing industries. Some industries process raw materials produced in local farms and forests. Others manufacture goods for use in Africa. South Africa is the most industrialized African country.

History

Africa is thought to be the place where humans first developed, more than 1 million years ago. The African continent had many kingdoms and empires during its early history. One of the world's earliest civilizations, ancient Egypt, devel-



Ruins of a casbah, or fort, stand in Morocco in North Africa.

oped in the lower Nile River valley nearly 5,000 years ago.

The region called Nubia was south of Egypt. The powerful Nubian kingdom called Kush ruled Egypt for a while in the 700s and 600s BC. In the AD 300s the kingdom of Aksum conquered Kush from the south.

The African people have a long history of contact with other powers. In about the 700s BC the Phoenicians established the city of Carthage in what is now Tunisia. In the 100s BC the Roman Empire took control of part of North Africa. Arabs from the Middle East spread into Africa in the AD 600s. Great trading states, including the Ghana, Mali, and Songhai empires, flourished in western Africa. In eastern and central Africa, powerful city-states such as Mogadishu and Mombasa traded with Arabia.

The first Europeans to arrive in Africa were the Portuguese, in the late 1400s. Soon the British, the Dutch, and the

French had also set up towns and trading centers. They traded slaves from Africa to the Americas from the 1500s to the early 1800s. The Europeans did not actually take control of the African territories they entered during this period, however.

Starting in the late 1800s Britain, France, Belgium, Portugal, and Germany ruled most of Africa as colonies. The Europeans took raw materials such as minerals and timber from their colonies and shipped them back to Europe. The African people had no say in how they were ruled. They were also often forced off the best land so that the Europeans could take it. Many African people resisted European control throughout the colonial period.

In the 1900s the colonies were finally granted independence. Many African countries faced great unrest after gaining independence. Ethnic violence led to many deaths, and in many cases civil war broke out as individuals and groups struggled to establish control. The poor economies of the countries added to the problems. In 2002 African countries formed an organization called the African Union to try to solve these problems. International agencies such as the United Nations helped, too.

► More to explore

African Union • Aksum • Colony
• Continent • Egypt, Ancient • Ghana Empire • Human Origins • Kush • Mali Empire • Nile River • Nubia • Rain Forest • Sahara • Slavery • Songhai Empire

African Americans

African Americans are people in the United States who have ancestors from Africa. Many African Americans have non-African ancestors as well. African Americans are also known as black Americans.

Slavery

Most African Americans have ancestors who were slaves. Slaves were people taken from their African homelands and shipped to the Americas. There, white people forced them to work without pay and in harsh conditions. English settlers brought the first African slaves to the colony of Virginia in the early 1600s. By 1790 black people made up nearly one fifth of the population of the United States. Most slaves lived and worked on plantations, or large farms, in the South.

Many people called abolitionists worked to end slavery. These included black people as well as white people. Harriet Tubman, a black abolitionist, organized the Underground Railroad, which was a way for slaves to escape to the North.

The American Civil War

The American Civil War broke out in 1861. This was a war between the Northern and Southern states, partly over the issue of slavery. In 1863 President Abraham Lincoln issued the Emancipation Proclamation. This document freed the slaves in the Southern states.

The North won the Civil War in 1865. That year the 13th Amendment to the U.S. Constitution ended slavery throughout the United States. In 1868 the 14th Amendment gave African Americans U.S. citizenship. In 1870 the 15th Amendment guaranteed them the right to vote.

Reconstruction

The period following the war was known as Reconstruction. African Americans were finally free, but most of them lived in terrible poverty. In the South many worked as sharecroppers. This meant that they farmed a piece of land owned by someone else. Their pay was a share of the crops they produced.

In addition, African Americans continued to suffer from discrimination (unfair treatment) and violence. Schools and other public places were often segregated. This meant that blacks and whites could not mix in those places. Violent groups like the Ku Klux Klan kept most blacks from voting in the South. These groups also hurt or killed many blacks.

First Civil Rights Efforts

In the late 1800s a former slave named Booker T. Washington became a powerful voice for African Americans. He believed in training African Americans to do certain jobs so that they could find work.

Other African American leaders disagreed with Washington. W.E.B. Du Bois thought that the government should guarantee to blacks the same rights that whites had. These

Did You Know?

February is Black History Month in the United States. In that month schools and other organizations help everyone learn about the African American experience.

rights—such as the right to vote or the right to go to a public school—are called civil rights. Du Bois and others formed the National Association for the Advancement of Colored People (NAACP) to help African Americans to gain full civil rights.

Great Migration

During World War I (1914–18) large numbers of African Americans began to leave the South. They moved to cities in the North and West. There they hoped to find jobs and to escape discrimination. However, many were forced to live in poor, segregated areas.

This movement from the South, called the Great Migration, continued through the 1960s. By 1970 about 6 million African Americans had left the South.

Civil Rights Movement

By the 1950s the NAACP had begun to use the court system to fight for civil rights for African Americans. One major success came in 1954. In that year the U.S. Supreme Court outlawed segregation in public schools.

These efforts soon turned into an organized fight for equal rights. This was called the civil rights movement. A Baptist minister named Martin Luther King, Jr., became the leader of the movement. In 1963 he led a major protest called the March on Washington.

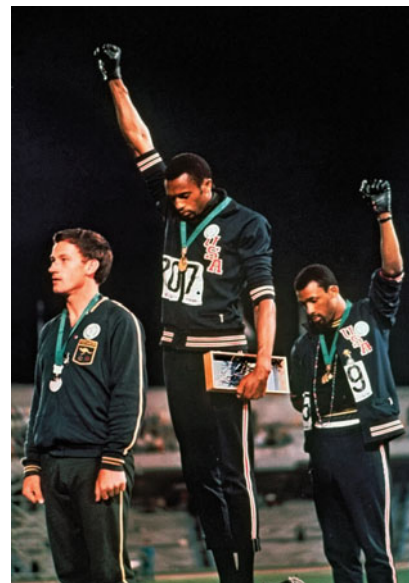
In 1964 the U.S. Congress passed the Civil Rights Act. This law banned discrimination based on race in schools, jobs, and many other areas.



In May 1954 the U.S. Supreme Court ruled that segregation in schools was illegal. Lawyers George Hayes (left), Thurgood Marshall (center), and James M. Nabrit (right) join hands outside the U.S. Supreme Court to celebrate the decision.

Black Power Movement

Despite these successes, some African Americans grew impatient with the slow pace of change. They began a



African Americans at the 1968 Olympics show their support of the black power movement with a raised-fist salute.

more extreme movement called the black power movement. Malcolm X and a group called the Black Panthers were among the movement's leaders. They believed that blacks should use violence, if necessary, to get power and justice.

During the 1960s violent riots did break out in black neighborhoods in many cities. The African Americans who rioted were angry about violent treatment by police, a lack of jobs, and poor housing.

Political Progress

After the 1960s the civil rights movement broke into many separate groups. Still, African American leaders continued their work to end discrimination.

In addition, many African Americans gained positions of power. In 1967 Thurgood Marshall became the first African American justice of the U.S. Supreme Court. In 2001 Colin Powell became the first black U.S. secretary of state, and in 2008 Barack Obama became the first African American to be elected president of the United States.

African Americans Today

In 2000 there were about 36 million Americans with African roots. They made up about 13 percent of the total U.S. population. One quarter of African Americans lived in poverty, and discrimination against African Americans remains a problem today. Nevertheless, African Americans have made great



Author Toni Morrison writes about the experiences of African Americans. She won the Nobel prize for literature in 1993.

gains since the end of slavery more than 140 years ago.

► More to explore

Civil Rights Movement • King, Martin Luther, Jr. • Malcolm X • Marshall, Thurgood • National Association for the Advancement of Colored People
• Slavery • Tubman, Harriet
• Washington, Booker T.

African National Congress

A political party in South Africa, the African National Congress (ANC) supported the rights of black and mixed-race people through the apartheid era. Nelson Mandela, the first black president of South Africa, belonged to the ANC.

In the early 1900s whites ruled South Africa. Blacks made up most of the



Thabo Mbeki stands in front of a board showing election results. Mbeki followed Nelson Mandela as leader of the ANC.

country's population but did not have equal rights. In 1912 black Africans who wanted equality formed the party that became the ANC.

In 1950 the South African government introduced apartheid. This system kept whites and nonwhites apart and denied nonwhites almost all their legal rights. The ANC protested. In 1960 the party was banned, but its members continued to protest, sometimes violently. The government arrested ANC leaders, including Mandela. In 1964 Mandela was sent to prison.

During the 1970s and 1980s the ANC gained support among South Africa's people. In 1990 the government lifted the ban on the party and freed Mandela. In 1994 an election open to all races was held. The ANC won control of the legis-

lature, and Mandela became South Africa's first black president.

► More to explore

Apartheid • Mandela, Nelson • South Africa

African Union



People carry pictures of African leaders at a ceremony celebrating the first meeting of the African Union.

In 2002, 53 African countries joined together to form the African Union (AU). The leaders of these countries felt that the union would benefit all the countries' people, governments, and businesses. The headquarters of the AU is in Addis Ababa, Ethiopia.

The AU took the place of the Organization of African Unity (OAU). The OAU had been formed in 1963. Around that time Africa was undergoing great changes. Colonies that had been under the control of European powers were

becoming independent countries. The new countries faced many challenges. The countries set up the OAU so that they could help each other.

African leaders formed the AU to improve what the OAU had been doing. One of the AU's goals is to promote unity, or togetherness, between African countries. Other goals are to defend the member countries and to encourage economic development. The AU also works for peace and stability, the end of hunger, and the protection of human rights.

The leaders of the AU hope to bring all of Africa under a single, central government someday. The AU already has its own parliament, or lawmaking body. The leaders are also planning a court system for all of Africa. In addition, they want the countries of the AU to use a single form of money.

► More to explore

Addis Ababa • Africa

Aging

All living things, from their first moment of existence, begin the process of aging, or growing older. As children move toward adulthood, they become taller, stronger, and more independent. At some point in adulthood, however, a slow decline begins. The onset of aging happens at different times for different people. Most people start to feel some effects of aging in their 40s or 50s.

As people age, their hair often thins and turns gray, and their skin wrinkles. Their



People of all ages can enjoy spending time together.

muscles begin to shrink and their bones become more fragile. They often lose some of their height or part of their vision or hearing. They think more slowly, and their short-term memory may suffer. Scientists are not exactly sure what causes the effects of aging. The cells of the body might have a built-in time limit. That limit would determine how long the cells can remain healthy and able to create new cells.

Several factors affect how long people live. One factor is heredity. Long lives seem to run in families. Another factor is lifestyle. Physically fit people who do not smoke will probably age more slowly and live longer than others. Poverty also affects how long people live. People who cannot afford to eat well and go to a doctor when they are sick may die before they become old.

Animals age at different rates and live for different lengths of time. These aging

rates depend on the type of animal. Rats may be said to be old at about 2 years, dogs at about 10 years, and elephants at about 40 years. For humans, people in their 60s and older are commonly considered to be old.

Agriculture

Agriculture is another word for farming. It includes both growing and harvesting crops and raising animals, or livestock. Agriculture provides the food and many of the raw materials that humans need to survive.

Raising Plants and Animals

The products of agriculture that people eat come from both plants and animals. Plant foods include fruits, vegetables, and grains. Meat, dairy (milk) products, and eggs are some of the most common animal foods.

Plants and animals also supply such natural materials as cotton, flax, wool, and hides. Workers process these materials into thread, cloth, and leather. Then people use the materials to make such

things as clothing, draperies, shoes, furniture coverings, and many other items.

Growing trees is another important agricultural job. Lumber from tree farms is used to make buildings, furniture, boats, and many other things. Christmas trees often come from tree farms, too.

Location and Weather

People practice agriculture on farms, on ranches, and in orchards all over the world. Farmers raise crops and livestock in every climate and in all kinds of different soil. Some regions receive a lot of sunlight or rainfall. Others have colder or drier weather. All places have their own kinds of agriculture.

Plants and livestock need air, water, and nourishment to stay alive. If a plant does not have the kind of soil it needs, it may die. Similarly, animals also need to have the right climate and the right food to survive. Farmers try to raise the kinds of livestock and plants that will do well in their region. If they do not have perfect natural conditions, they try to create the best conditions possible. For example, many farmers in dry areas use irrigation, or artificial watering.

History

Humans may have begun taming animals and growing small crops as early as 10,000 years ago. However, many early people were nomads, or wanderers who moved from place to place. They found their foods in the wild as they traveled. They hunted, fished, and gathered nuts, berries, and roots.



An ox helps a man plant rice in Vietnam.



Some farmers use special irrigation systems to water their crops.

Eventually people learned to keep some animals in herds. They stopped roaming and began to settle in one place for longer times. They built homes and started to grow their own crops on the land around them. The crops provided a more dependable food supply than hunting and gathering. Small settlements grew into villages, towns, and cities.

About 200 years ago the Industrial Revolution brought great changes to agriculture. In the past people had used hand tools and animals to help them plant and harvest. Machines invented during the Industrial Revolution made that work easier. As a result, not as many workers were needed on farms. Many people moved away from farms to cities in search of jobs.

Today most agriculture takes place far outside big cities. Huge companies control much of the world's farmland. Crops grow on large plots of land with the help of irrigation and special chemicals. Farmers raise healthy livestock with the help of medicine. In poor countries,

however, many people still depend on their own small farms to survive.

► More to explore

Industrial Revolution • Irrigation • Soil

AIDS

AIDS is a serious disease. The name stands for acquired immunodeficiency syndrome. Millions of people have died from AIDS since the 1980s. Scientists have not yet found a cure, but they can treat the disease effectively.

Causes

Tiny particles called viruses cause many diseases. The particular virus that causes AIDS is called human immunodeficiency virus (HIV). HIV enters the body through contact with infected blood or other body fluids. Coughing, sneezing, and handshaking do not spread the virus.

HIV kills helper T cells in the body. Helper T cells are a type of white blood



The AIDS Memorial Quilt is displayed in Washington, D.C. The quilt honors people who have died of the disease.

cell. They are part of the body's immune system, which fights off disease. The body loses its ability to fight off disease when its helper T cells die.

Symptoms

A new HIV infection often causes symptoms, or signs, that are similar to those of influenza (flu). They usually last only a week or two. After they clear up, an infected person may show no signs of illness for years. However, such a person can still pass the virus to other people.

Because of their weak immune systems, most HIV-infected people eventually come down with other infections. A person who has these infections is said to have AIDS.

The most common infections include tuberculosis and a certain type of pneumonia. People with AIDS also frequently develop a cancer called Kaposi sarcoma. The AIDS virus may also attack the nervous system and cause brain and eye damage. Death often follows.

Prevention and Treatment

People can prevent HIV infection. The main way to do this is to keep out of contact with possibly infected blood or body fluids.

If a person is infected, certain drugs can stop HIV from doing damage. Drug treatment has added years to the lives of many people with HIV infections.

► More to explore

Disease, Human • Immune System
• Virus

Ailey, Alvin



Members of the Alvin Ailey American Dance Theater rehearse a scene from the dance called *Revelations*.

Alvin Ailey was a famous modern dancer. He was also a highly respected choreographer—a person who creates dances and directs dancers. His dance company toured around the world, bringing recognition to African Americans in dance.

Ailey was born in Rogers, Texas, on January 5, 1931. His family moved to Los Angeles when he was 12. Ailey began to study modern dance at the Lester Horton Dance Theater in 1949. He became the company's director and choreographer in 1953.

In 1954 Ailey moved to New York City, where he studied with modern dance pioneer Martha Graham and others. He created the Alvin Ailey American Dance Theater in 1958. The troupe performed many kinds of works, but Ailey particularly wanted to bring African American culture to modern dance.

Did You Know?

AIDS exists everywhere in the world. However, the disease is a particularly big problem in parts of Africa.

In 1958 Ailey achieved his first big success as a choreographer with *Blues Suite*. One of his most famous dances is *Revelations* (1960), which is set to African American spirituals. His works combine ballet and modern dance.

In 1965 Ailey retired from dancing, but he continued choreographing. He died in New York City on December 1, 1989. His company remained in operation after his death.

► More to explore

Dance • Graham, Martha

Air

All living things need air to breathe. Animals and plants would die without it. Air also holds airplanes and kites above the ground, and it is used to inflate tires and balloons. Air surrounds Earth as the atmosphere. Air has no color, taste, or odor. Although air is invisible, people can hear air when the wind howls. And they can feel air brush against their skin when the wind blows.

Air consists of a mixture of gases. These gases consist of tiny particles called molecules. They are so small that they cannot be seen. Molecules are combinations of different chemical elements. In air the most common of these elements are nitrogen and oxygen. Oxygen is an important component of air because humans and other animals need it to survive. In addition to nitrogen and oxygen, air consists of small amounts of the gases argon, neon, helium, and methane. Besides gases, air also contains



A kite takes flight on a windy day.

water vapor, dust, pollen, and bacteria. The water vapor in air is the source of rain and snow.

The oxygen in air comes from plants. Through a process called respiration, or breathing, humans and other animals take in oxygen and force out carbon dioxide. Carbon dioxide is a molecule made of oxygen and carbon. Plants take in the carbon dioxide and use it to make food. This is part of the process known as photosynthesis. Plants break down the molecule, use the carbon, and then release the oxygen into the air. In this way the carbon dioxide and oxygen in the air are constantly used and replaced.

► More to explore

Atmosphere • Molecule • Photosynthesis

Air Force

An air force is the part of a country's military that conducts warfare in the skies. Its pilots fly airplanes and other aircraft armed with weapons. They use these aircraft to attack enemy aircraft as



U.S. Air Force planes called F-16 Fighting Falcons fly in formation.

well as targets on the ground and in the water, mostly during wars.

An air force is usually one of several branches of a country's military. In the United States the other major branches are the Army and the Navy (which includes the Marine Corps).

Basic Functions and Aircraft

Most air forces perform a variety of military functions, or jobs. During wars an air force uses aircraft to observe the enemy's activities. It also gathers information about possible battlefields and targets.

Another basic job of an air force is to gain control of the air over a particular area. To do this, it uses aircraft called fighters to drive away or destroy enemy aircraft. Fighters are jet airplanes designed to fly very fast. They can also change direction quickly. Fighters carry missiles, machine guns, or other weapons on board.

An air force also uses aircraft to drop bombs. It often uses large aircraft called bombers to bomb targets in an enemy's country. It uses attack aircraft to help its country's troops fighting on the ground. Pilots fly attack aircraft close to the ground while bombing or shooting at enemy troops below. Attack aircraft are smaller and lighter than bombers.

Another duty of an air force is to move troops and military supplies from place to place. It normally uses helicopters or large transport planes to do this.

History

Inventors created the first successful airplanes in the early 1900s. Several European countries used fighter aircraft and bombers during World War I, from 1914 to 1918. Air warfare was a major part of World War II in the 1940s.

Air forces have used many new inventions to improve their aircraft and weapons over the years. For example, the jet engine was invented in the middle of the 1900s. This allowed planes to fly much faster. Computer technology has also helped in many ways. It has made it possible to bomb faraway targets with great accuracy. Computers are also used to help train pilots to fly airplanes and to keep airplanes on course.

► More to explore

Airplane • Army • Bomb • Navy

Airplane

Humans have always envied birds for their ability to fly. In the 1700s and

Did You Know?

The United Kingdom's Royal Air Force was formed in 1918. It was the world's first air force.



Modern passenger airplanes can carry hundreds of people to almost anywhere in the world.

1800s humans flew in lighter-than-air ships such as balloons, but not until 1903 did people build the first heavier-than-air craft—the airplane.

The term airplane, which is often shortened to plane, usually refers to any type of power-driven aircraft that has fixed wings and is heavier than air. An airplane moves through the air with the help of its engine and wings. The wings are shaped in a particular way so that air flows over them and gives them lift. By contrast, balloons and airships are lifted by gases that are lighter than air. Helicopters are lifted by spinning blades.

Types of Airplanes

Airplanes can be grouped into many different categories. One way of classifying them is by the number of wings they have. Many early airplanes were biplanes, meaning that they had two pairs of wings, one above the other. Triplanes were also built in the early days of aviation. Today most airplanes are monoplanes, with one pair of wings.

Most airplanes take off and land from dry land, but some operate on water. Seaplanes have special landing gear that supports them in the water.

Airplanes can also be grouped by their purpose. Airplanes used for military purposes by the armed forces include fighters, bombers, spy planes, troop transports, and tankers that refuel other military planes while in flight. The familiar airliners that carry large numbers of people from city to city are called civil, or commercial, aircraft. Other kinds of



Seaplanes have special landing gear that allow them to take off from and land on the water.

civil aircraft carry cargo. Still others are flown by their owners as a hobby.

Parts of an Airplane

To understand how an airplane can fly, it is first necessary to know its different parts. The major parts are the airframe, the power system, and the flight controls and instruments.

Airframe

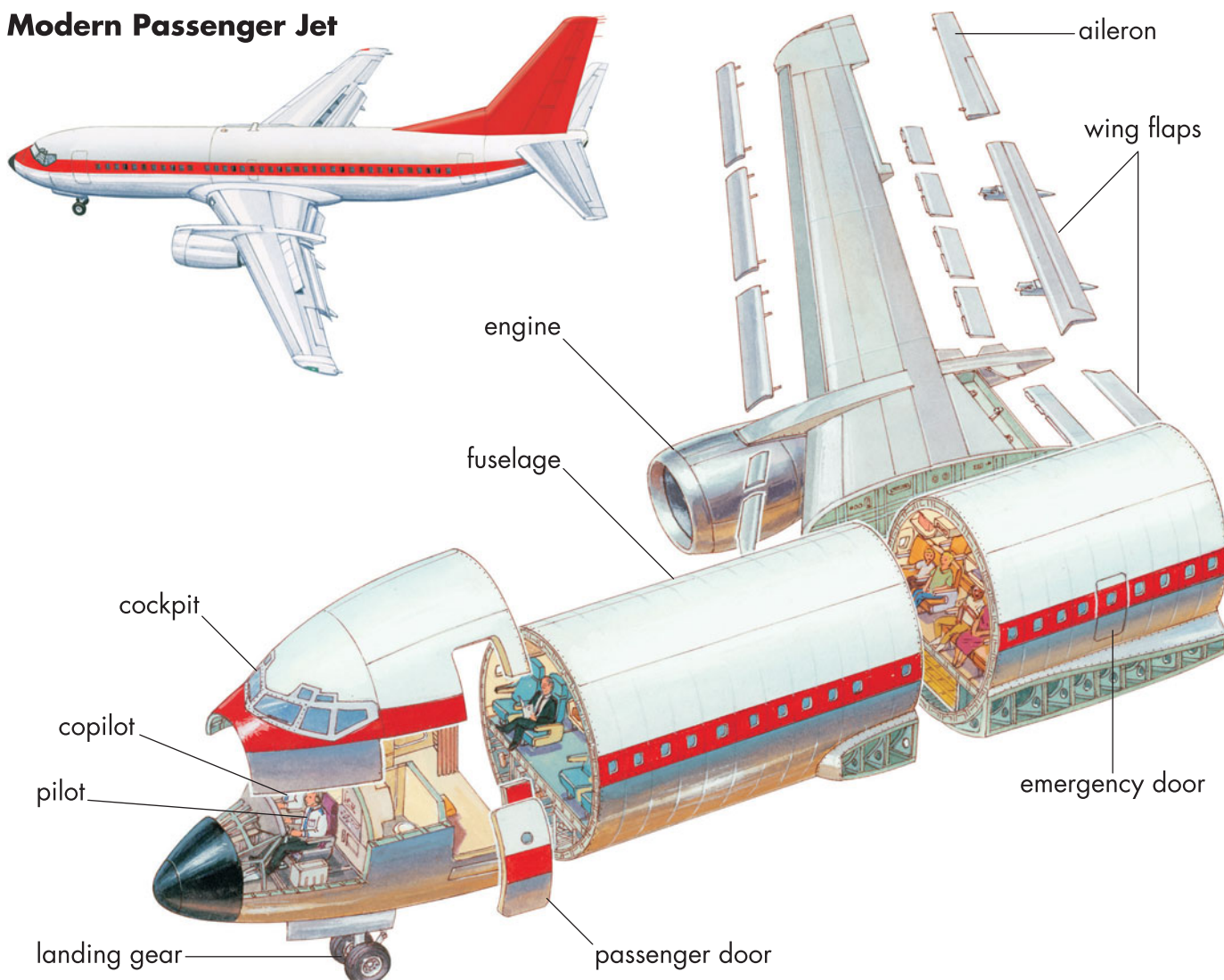
The airframe includes the fuselage, wings, tail, and landing gear. The fuselage is the body of the aircraft. It consists

of a rigid frame and a covering of aluminum, magnesium, or molded plastic or fiberglass.

The wings of an airplane have several moving parts. Flaps and slats are hinged parts that the pilot adjusts to increase the size of the wing surface. This changes the amount of force made by the wing. Ailerons are hinged parts that the pilot moves to turn the airplane.

The rear of the plane is called the tail. The horizontal stabilizer is a part of the

Modern Passenger Jet



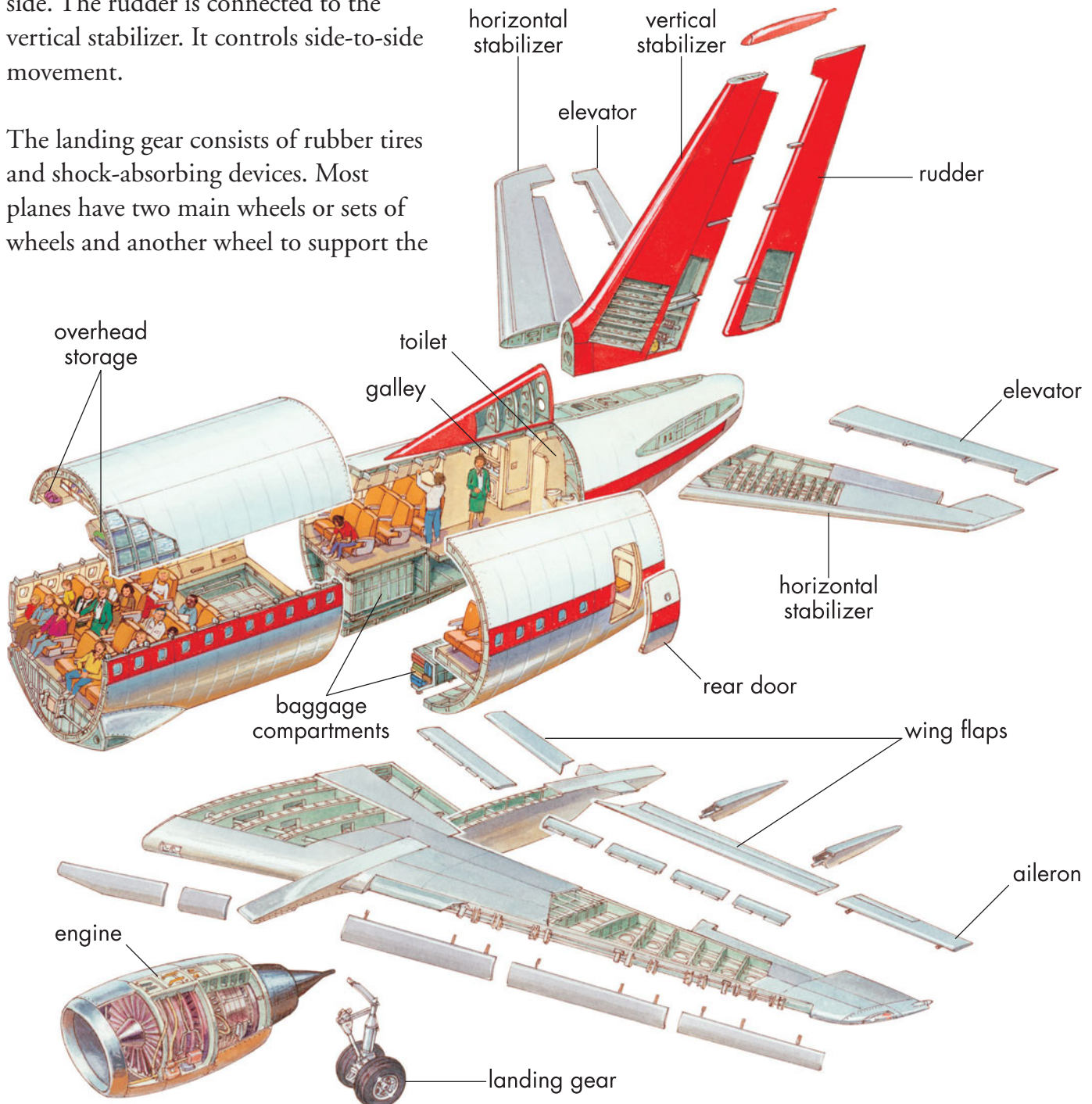
tail that often looks like a small wing. It prevents the plane from pitching, or bucking up and down. The elevator is hinged to the horizontal stabilizer. It raises or lowers the nose, or front end, of the plane. The vertical stabilizer often looks like a fin. It prevents the aircraft from yawing, or swinging from side to side. The rudder is connected to the vertical stabilizer. It controls side-to-side movement.

The landing gear consists of rubber tires and shock-absorbing devices. Most planes have two main wheels or sets of wheels and another wheel to support the

tail. Some planes have wheels that fold up when the plane is in the air.

Power System

A plane's power system includes one or more engines and sometimes propellers. The two main types of engines are reciprocating engines and jet engines. A





A plane with turboprop engine uses both jet power and propellers. Turboprop engines are used only in small planes.

reciprocating, or piston, engine turns a propeller. The turning of the propeller provides most of the power to move the plane forward. Reciprocating engines are usually found on smaller airplanes. A jet engine moves a plane forward by shooting exhaust gases out the back. Jet engines are common on large commercial planes and military aircraft. Some small planes have a turboprop engine, which is a jet engine that turns a propeller.

Flight Controls and Instruments

Flight controls help a pilot to regulate the movement and position of an airplane. The control wheel or stick is used to adjust the elevator and the ailerons. Foot pedals allow the pilot to control the rudder. A throttle controls the engine power. The pilot also controls the wing flaps and slats.

Flight instruments are used for navigation, checking engine performance, and monitoring other equipment. In addition to these instruments, there are a

variety of indicators that monitor the engines and other parts of the plane's mechanical and electrical systems.

How Airplanes Fly

The science of flight is called aerodynamics. Four main aerodynamic forces act on an airplane in flight. They are called drag, thrust, gravity (or weight), and lift.

As a plane flies, the air slows it down. This is the effect of drag. To overcome drag a plane needs the forward-moving force of thrust. Thrust is produced by the plane's engines or propellers.

An airplane is heavier than air. It will fall to the ground under the influence of gravity unless lift is applied. The plane's wings are able to produce the necessary lift because of their shape. The upper surface is curved, while the lower surface is flat. To get past the curved surface, the air that flows over the wing has to go farther—and therefore faster—than the air that flows under it. This creates a difference in air pressure between the upper and lower surfaces as the plane moves forward. The air underneath is under greater pressure and therefore pushes the wing up. The faster the air flows past the wings, the greater the lift. For this reason, an airplane takes off most easily when it faces the wind.

Pilots use flaps and slats to change the amount of lift. Lowering the flaps increases the curved surface of the wing, which provides more lift for takeoff. Slats also increase lift by allowing air to flow more smoothly over the wing. Rais-

ing the flaps reduces lift, which slows down the plane for landing.

History

Before humans took to the air in airplanes, they flew in lighter-than-air craft. In 1783 the Montgolfier brothers of France made the first balloon that could carry people high into the air. Their balloon rose because they filled it with hot air, which is lighter than unheated air.

The 1800s saw much experimentation in both lighter-than-air and heavier-than-air craft. Several people worked with gliders to establish the principles of airplane design. Gliders are similar to airplanes but they have no motor. Once they are launched, they move through the air as a plane does.

Early Aviation

On December 17, 1903, in Kitty Hawk, North Carolina, Orville and Wilbur Wright made the first flight in an engine-powered airplane. The Wright

brothers had experimented with gliders. They chose the North Carolina coast for their testing because of its strong winds. Their first plane flight, with Orville piloting, lasted 12 seconds and covered 120 feet (37 meters). By 1905 the Wright brothers had improved their plane to the point that it could fly 24 miles (39 kilometers) in 38 minutes.

During World War I (1914–18) airplanes began to change the nature of war. Planes were first used to observe the enemy from the air. Eventually countries discovered that they could use planes for dropping bombs. Pilots also learned to shoot at each other in the sky.

Development of Modern Aviation

After the war people began to use planes for commercial purposes, including delivering mail. Pilots also began to experiment with seeing how far they could fly. A U.S. airmail pilot named Charles Lindbergh became famous in 1927 for making the first solo flight over the Atlantic Ocean.

Jet-powered aircraft were introduced on a small scale during World War II (1939–45). After the war jet planes were improved and came into wide use. Regular passenger jet services across the Atlantic were started in 1958. Today passenger jets fly people all around the world every day.

Air Travel Safety

Airline safety became an important issue in the second half of the 20th century. In the United States a government agency called the Federal Aviation



An early airplane flies over Chicago, Illinois, in 1911.

Did You Know?

Only a few experimental airplanes have used rocket engines. A rocket-powered airplane called the X-15 set records for speed and height of flight.

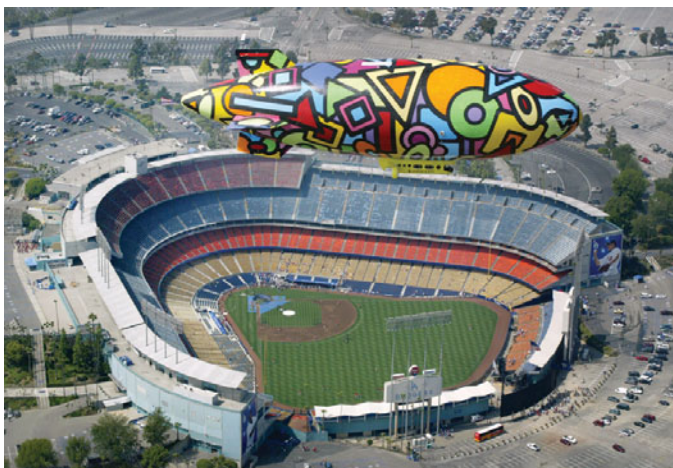
Administration (FAA) was created in 1958 to monitor aircraft and to investigate accidents. The FAA also operates the air traffic control system, which keeps planes out of each other's way. Human error, equipment failure, and weather can cause accidents. But flying is still far safer than traveling by car.

► More to explore

Balloon • Glider • Helicopter • Wright, Wilbur and Orville

Airship

The large aircraft that are often seen floating over sporting events are commonly known as blimps. These are actually a type of lighter-than-air craft called an airship. Airships were developed from principles of ballooning. Like balloons, they are filled with a gas that allows them to float in the air. Unlike balloons, airships are driven by engine-powered propellers and steered with rudders. For this reason they are also called dirigibles—after the French word *diriger*, meaning “to steer.”



A colorful airship flies over Dodger Stadium in Los Angeles, California.

Most airships are long and cigar-shaped. Some airships have a rigid frame supporting the craft's surface fabric. Non-rigid airships are simply big balloons that rely on the gas to keep their shape. Nonrigid airships are also known as blimps. The main section of an airship is filled with a gas that is lighter than air. Helium is the most commonly used gas. A car, or gondola, suspended below the gas balloon holds the airship's crew and passengers.

Airships rely on several different features to enable them to fly. The gas inside the ship lifts the craft into the air. Engines then propel the craft forward. The pilot uses a rudder to steer the craft. Most of the ship is filled with the lighter-than-air gas. There are also compartments filled with normal air. The pilot can make the ship go up or down by controlling the amount of air in these compartments.

The first propeller-driven airship flew in 1852 in France. Its engine was powered by steam. The first rigid airship, with a body made of aluminum, was built in Germany in 1897. Ferdinand von Zeppelin, the famous German builder, completed his first rigid airship in 1900.

Akimel O'odham

► see Pima.

Akmola, Kazakhstan

► see Astana.

Aksum



Aksum, or Axum, was a powerful trading empire that flourished in northeastern Africa hundreds of years ago. Aksum also was the name of the kingdom's capital. It remains a city in northern Ethiopia.



One of the obelisks from the kingdom of Aksum stands in the modern city of the same name.

Aksum's location between the Red Sea and the Nile River helped to make it one of the most important and wealthy trading centers of its day. The items that moved in and out of its ports included ivory, hippopotamus hides, perfumes, gold, and animals.

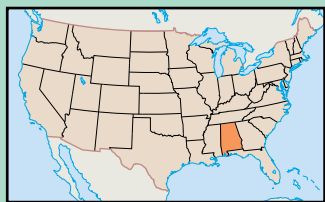
The kingdom was also known for its architecture. Still standing in the central square of the city of Aksum are some of the carved granite obelisks made in the kingdom. An obelisk is a tall, thin pillar with a pyramid at the top. (The Washington Monument is an obelisk.) Some Aksum obelisks may have marked underground tombs of the kingdom's rulers.

Aksum expanded as it grew more powerful. In the AD 300s Aksum conquered the kingdom of Kush to the north. Aksum's rulers then pushed west across the Red Sea into southern Arabia. In the 600s and 700s the kingdom's hold weakened as the Muslim Arabs emerged as a power.

The people had been Christian since the 300s. The Arabs allowed them to keep the Christian religion because they had once given refuge to followers of Islam's founder, the prophet Muhammad. Today Aksum is considered a holy city of the Ethiopian Orthodox church.

► More to explore

Arabian Peninsula • Eastern Orthodox Churches • Ethiopia • Islam • Kush • Muhammad



Alabama

The state of Alabama is located in the center of the Deep South of the United States. Because of its location, the land that is now Alabama played a role in many of the major conflicts that shaped the United States. These included battles with Native Americans over control of the area, the American Civil War, and the civil rights movement of the 1960s. Montgomery is Alabama's capital.

Geography

Alabama lies in the southeastern United States. The southern parts of the Appalachian Mountains cover most of northern Alabama. The land is rugged, with forested hills and ridges. Southern Alabama is a mostly flat plain. The climate is

mild. Summers are long and warm. Winters are short and moderate.

People

People of European ancestry make up almost three quarters of Alabama's population. About one quarter of the population is African American. Slightly more than half of the people live in cities or towns. Birmingham is Alabama's largest city and industrial center. Mobile is a port city on Mobile Bay. Tuscaloosa is the home of the University of Alabama's main campus.

Economy

Trade and tourism are important service industries in Alabama. Tourists are drawn to Alabama because of its warm weather and recreational activities. Manufacturing, especially of paper and metal products, is also important.

Soybeans are a valuable crop in Alabama. Other farm products include peanuts, cotton, corn, and pecans. Shellfish and fish, such as shrimp and catfish, are also harvested.

History

The early Native Americans of Alabama are sometimes called mound builders. They lived in villages built around large earthen mounds. By the 1700s the Cherokee, the Creek, the Choctaw, and the Chickasaw were the main Native American tribes in the region.



The Spaniard Hernando de Soto explored the area in about 1540. In the early 1700s the French built settlements in several places. In 1763 France gave its land in North America, including Alabama, to Great Britain. During the American Revolution Spanish troops captured Mobile. In 1783 Britain surrendered Alabama to the United States. In 1813 the United States seized Mobile from the Spanish.

Alabama became a state in 1819. It prospered because of cotton farming. Black slaves did most of the work on the cotton farms. Alabama, like other Southern states, feared that the U.S. government would outlaw slavery. In 1861 Alabama withdrew from the United States. It joined with other Southern states to form a separate government called the Confederacy. U.S. forces defeated the

Confederacy in the Civil War, which ended in 1865. Alabama rejoined the United States in 1868.

Although the Civil War ended slavery, African Americans continued to struggle in Alabama. Several major events of the civil rights movement took place in the state. Martin Luther King, Jr., led a bus boycott in Montgomery in 1955–56. In 1965 he led a protest march from Selma to Montgomery. New laws passed during the civil rights movement helped improve conditions for African Americans in Alabama. Since the 1960s many black candidates have been elected to public office in the state.

► More to explore

American Civil War • Appalachian Mountains • Civil Rights Movement • Confederate States of America • King, Martin Luther, Jr. • Montgomery



A machine called a combine is used to harvest ripe cotton. Cotton is an important crop in Alabama.

Facts About ALABAMA

Flag



Population

(2000 census)
4,447,100—
rank, 23rd state;
(2008 estimate)
4,661,900

Capital

Montgomery

Area

52,419 sq mi
(135,765 sq
km)—rank, 30th
state

Statehood

December 14,
1819

Motto

*Audemus Jura
Nostra Defendere*
(We Dare
Maintain Our
Rights)

State bird

Yellowhammer



State flower

Camellia



Alamo

In the 1830s the people of Texas fought several battles to gain their independence from Mexico. One of the most famous battles took place at the chapel of a mission in San Antonio called the Alamo. More than 180 Texas fighters died while fighting against soldiers from Mexico. When Texans later won their independence from Mexico, their battle cry was, “Remember the Alamo!”

The Mission San Antonio de Valero was founded in about 1716 by Roman Catholic priests. They abandoned it before the end of the century. Afterward the chapel became known as the Alamo (Spanish for “cottonwood”) because it stood near a grove of cottonwood trees.

In 1835, during Texas’ war for independence from Mexico, the Texans captured

San Antonio. Afterward, however, fewer than 150 men were left there to defend the city. A few others arrived later, including the frontiersman Davy Crockett.

On February 22, 1836, about 5,000 Mexican soldiers arrived in San Antonio. On February 23 the Texas troops moved into the Alamo, prepared to resist an attack. The Mexicans surrounded the Alamo and the battle began.

On the morning of March 6 the Mexicans stormed the building through a hole in the outer wall. Within a few hours all of the defenders were dead. Texas finally gained independence later that year, and in 1845 it became a U.S. state.

► More to explore

Crockett, Davy • Texas



The Alamo has been preserved as a historic site. It is a reminder of the time when Texans fought for independence from Mexico.

Alaska

The U.S. state of Alaska is an immense region of great natural beauty but few people. Nicknamed the Last Frontier, Alaska includes rugged coastlines, massive glaciers, and the tallest mountains in North America. The capital is Juneau.

Geography

Alaska is the largest state in the country. When it became a state, the land area of the United States increased by one fifth. The most northerly state, Alaska is not connected to the other 48 states of the mainland United States. Instead, it juts westward from Canada into the Arctic Ocean and the Bering Sea. The Aleutian Island chain extends southwest from mainland Alaska. To the southeast is a strip of land called the panhandle, which borders the Canadian province of British Columbia.

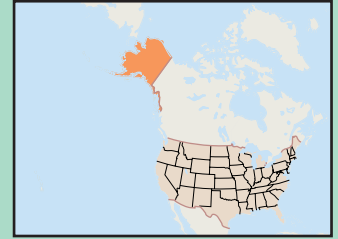
Northern Alaska lies within the Arctic regions. Along the northern coast is flat, treeless land called tundra. The ground there stays frozen year-round. South of the tundra are the mountains of the Brooks Range. The middle part of Alaska is a vast plain with many forests, marshes, and lakes. The Yukon, Alaska's largest river, flows through this region. Two mountain chains—the Alaska Range and the Aleutian Range—curve along Alaska's southern coast. Mount McKinley, in the Alaska Range, rises to a height of 20,320 feet (6,194 meters). It is the highest point in North America.

People

Alaska's population is spread unevenly throughout the state, with vast areas having few or no people. More than a third of Alaskans live in or around Anchorage, the largest city. Native Alaskans—Eskimo (Inuit), Aleut, and American Indians—make up about one sixth of the population. Common nationalities among the rest of the people include Russian, Filipino, Japanese, and Chinese.

Economy

Alaska's economy is based on oil, tourism, and fishing. Oil has brought Alaska so much wealth that the state has no income tax. In addition, every year the state gives each resident some of the money earned from oil sales. Service businesses such as airlines, restaurants, and hotels cater to tourists. About one fourth of all employed Alaskans work for the federal, state, or local government. Salmon is one of the state's lead-



Facts About ALASKA

Flag



Population

(2000 census)
626,932—rank,
48th state; (2008
estimate)
686,293—rank,
47th state

Capital

Juneau

Area

663,267 sq mi
(1,717,854 sq
km)—rank, 1st
state

Statehood

January 3, 1959

Motto

North to the
Future

State bird

Willow
ptarmigan



State flower

Forget-me-not



A visitor looks across a bay at a glacier in Alaska's Wrangell-Saint Elias National Park.

ing products. Other catches include crab, halibut, herring, and shrimp. The main manufacturing industry is fish and seafood processing.

History

Hunters and gatherers from Asia first settled in what is now Alaska thousands of years ago. In 1728 a Russian expedition led by the Danish explorer Vitus Bering arrived there. In 1784 Russia established a settlement and fur-trading post on Kodiak Island, off the southern coast. Russia owned Alaska until the United States bought it in 1867. U.S. Secretary of State William H. Seward negotiated the deal. Because many Americans thought the purchase was a waste of money, Alaska was sometimes called Seward's Folly.

Gold discoveries in neighboring parts of Canada and in Alaska itself drew people to the area in the 1890s and early 1900s. A half century later, in 1959, Alaska became the 49th state in the Union.

Oil discoveries, especially along the Arctic coast, changed the state's economy. In the 1970s the Trans-Alaska pipeline was built to transport oil from the Arctic oil fields. The pipeline made Alaska second only to Texas in U.S. oil production. In the early 21st century environmental groups, government officials, and business leaders debated whether to open up more government-owned land in Alaska to oil exploration.

► More to explore

Aleut • Arctic Regions • Eskimo
• Juneau • Tundra

Albania



The citadel, or fortress, at Krujë was the stronghold of Albania's national hero, Skanderbeg. In the 1400s he fought to keep the Ottoman Turks from invading Albania.

The Republic of Albania in eastern Europe is the smallest country on the Balkan Peninsula. During most of its history Albania has been ruled by other countries and empires. The capital is Tiranë.

Geography

Albania is bordered by Greece, Macedonia, Kosovo, and Montenegro. Its western border is the Adriatic Sea. Most of Albania is mountainous. The highest mountain is Korab, at 9,026 feet (2,751 meters). Albania's only lowland area lies along the coast. The longest river is the Drin. Albania has warm, dry summers and mild, wet winters. Temperatures are more extreme in the mountain regions than on the coast.

Plants and Animals

Forests once covered much of Albania. After centuries of clearing and livestock grazing, many areas now have only bushes and scrub. The remaining forests have oak, beech, and pine trees.

Hunting has left few wild animals, except in the remote forests. Among them are wolves, jackals, wild hogs, bears, deer, and chamois (goatlike animals). The mild climate attracts many birds, however.

People and Culture

The people of Albania are divided into two major groups: the northern Gëgs and the southern Tosks. Each group speaks its own dialect, or variation, of the Albanian language. Minority groups, including Vlachs and Greeks, make up about 8 percent of Albania's population.





Albanian women tend to their crops.

About 39 percent of Albanians are Muslim. Others are Eastern Orthodox, Roman Catholic, or not religious.

Economy

The Albanian economy is one of the poorest in Europe. More than half of the workers are farmers. Albania's chief crops are vegetables, grains, melons, and potatoes. Sheep, goats, cattle, and poultry are the major livestock.

Albania manufactures textiles, glass products, leather, iron, steel, and office machinery. Its mines provide chromium and copper. The southwestern part of the country is rich in petroleum (oil) and natural gas.

History

The Illyrians, ancient ancestors of the Albanians, were likely the first people to live in what is now Albania. The Gëgs were Illyrians who settled in the north. The Tosks were Illyrians of the south. The Romans invaded in the 100s BC. In AD 395 the Roman Empire split into

two halves. Albania was in the eastern part, the Byzantine Empire. Bulgaria and Serbia later controlled the area.

In the late 1300s Albania became part of the Islamic Ottoman Empire. The Ottoman Turks ruled the country for almost 500 years. Albania gained its independence in 1912.

In 1928 Albania's president declared himself King Zog I. After Italy invaded Albania in April 1939, Zog fled the country. Germany took over from 1943 to 1944.

In 1944 Communist leader Enver Hoxha took over the Albanian government. Hoxha led Albania for four decades. During this period the Communist country was cut off from the rest of the world. After Hoxha's death in 1985, Albania reopened relations with many countries.

In 1998 and 1999 fighting broke out between Serbs and Albanians living in Kosovo. At the time, Kosovo was a province of Serbia that bordered Albania, and most of its residents were ethnic Albanians. Many of them crossed into Albania from Kosovo. Most of the refugees returned to Kosovo after the fighting ended, but some stayed in Albania. In 2008, Albanians rejoiced when Kosovo declared independence from Serbia.

► More to explore

Balkan Peninsula • Byzantine Empire
• Communism • Islam • Kosovo
• Ottoman Empire • Tiranë

Facts About ALBANIA



Population
(2008 estimate)
3,194,000

Area
11,082 sq mi
(28,703 sq km)

Capital
Tiranë (Tirana)

**Form of
government**
Republic

Major cities
Tiranë (Tirana),
Durrës, Elbasan,
Shkodër

Albany



Population
(2000 census)
95,658; (2007
estimate)
94,172

Albany is the capital of the U.S. state of New York. The city's port on the Hudson River has long been a major shipping center. The port lies along a water route that links the Great Lakes to the Atlantic Ocean. State government also plays a large role in Albany's economy.

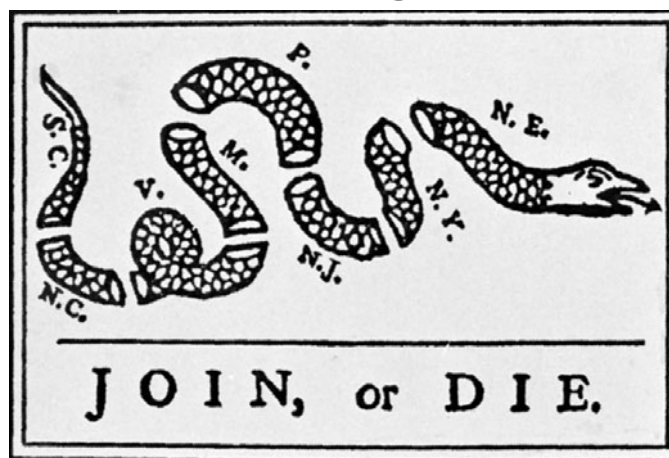
The first permanent settlement was founded on the site in 1624. Later the Dutch and then the English controlled the village. The English named it Albany in 1664. An important meeting called the Albany Congress was held in the city in 1754. At that meeting Benjamin Franklin proposed a plan to unite all the American Colonies under one government. Albany became the

capital of New York in 1797. In the early 1800s a railroad and the Erie Canal were built through Albany. They helped the city grow as a center of transportation.

► More to explore

Albany Congress • Erie Canal

Albany Congress



In 1754 representatives of the American Colonies put together a plan of union at the Albany Congress. Benjamin Franklin published a cartoon to show why he thought the union was important.

The Albany Congress was a meeting held in Albany, New York, in 1754. Representatives of some of Great Britain's American Colonies met with members of the Native American Iroquois Confederacy. The main purpose of the meeting was to discuss plans for the French and Indian War, which was just beginning. But the meeting is now remembered for its plan to unite the colonies.

The plan was written mostly by Benjamin Franklin. It called for one government for all the colonies. The leader was



The statehouse in Albany is the center of New York State's government.

to be a president-general appointed by the English king. The legislature was to be appointed by the existing colonial legislatures.

The congress passed the plan but it never went into effect. Both the king and the colonies thought it gave too much power to the other side. However, the plan served as a model when the colonies united to form the United States 22 years later.

► **More to explore**

Franklin, Benjamin • French and Indian War

Albatross

Albatrosses are large ocean birds with very long, narrow wings. They can fly long distances with little effort. They



The wings of a black-browed albatross can measure more than 7 feet (2.1 meters) from tip to tip.

glide gracefully for hours, even in heavy storms. However, these birds make clumsy “crash” landings. They also attract mates with funny-looking dances and displays. For these reasons sailors sometimes call them gooney birds.

There are more than 10 species, or types, of albatross. They belong to the family of birds called Diomedidae.

Albatrosses are birds of the open sea. They sleep on the surface of the water. They have no need to visit land except during breeding season. Most types fly over the South Pacific, Indian, and South Atlantic oceans. A few types fly over the North Pacific Ocean. Albatrosses breed and nest on islands.

Albatrosses are among the largest flying birds. They can weigh as much as 25 pounds (11 kilograms). The wingspan of the wandering albatross may be more than 11 feet (3 meters)—longer than that of any other living bird. An albatross has a big head, a hooked bill, and webbed toes. Most adult albatrosses have white body feathers with black, brown, or white wing feathers. A few types have brown feathers all over.

Albatrosses can soar on air currents for hours without flapping their wings. But they have difficulty flying in calm air.

Albatrosses eat mainly squid and sometimes fish. They also eat food scraps cast off by passing ships.

► **More to explore**

Bird

Alberta



A mountain is reflected in Lake Louise. The lake is part of Banff National Park in Alberta.

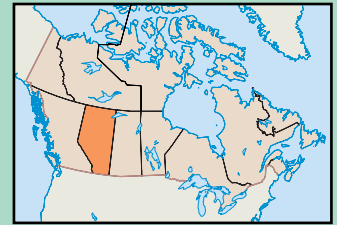
The province of Alberta in western Canada is one of the country's three Prairie Provinces, but it is known for its minerals as well as its crops. The province was named after Princess Louise Caroline Alberta, a daughter of Queen Victoria, when Great Britain ruled Canada. The capital is Edmonton.

Geography

Alberta borders British Columbia on the west and the Northwest Territories on the north. To the east is Saskatchewan, another of the Prairie Provinces. To the south is the U.S. state of Montana.

Most of Alberta's land is a flat plain. In the south the plain is treeless prairie, but in the north it is forested. The province is dotted with many lakes, especially in the north. In the southwestern part of Alberta are the Canadian Rocky Moun-

tains. The scenic Banff and Jasper national parks lie in the Rockies.



People

People with English, Scottish, or Irish ancestors make up the largest ethnic groups in Alberta. Many other residents have German, French, or Ukrainian origins. Though Alberta's American Indian population is fairly small, the province has more Métis than any other province. Métis have a mixed Indian and European background.

Four of every five people in Alberta live in cities or towns. The largest cities are Calgary and Edmonton. Calgary is a





Calgary is one of the largest cities in Alberta. It is located in the southern part of the province.

financial center and a shipping point for products of the surrounding farms and ranches. Edmonton is called the Gateway to the North because it is farther north than any other large Canadian city. It is a center of the oil and gas industry. The University of Alberta is in Edmonton.

Facts About ALBERTA

Flag



Population
(2006 census)
3,290,350

Area
255,541 sq mi
(661,848 sq km)

Capital
Edmonton

Motto
Fortis et Liber
(Strong and Free)

**When Alberta
Became a
Province**
1905

Economy

Services, including banking, education, and health care, make up the biggest part of Alberta's economy. The province's spectacular mountain scenery attracts many visitors and makes tourism a leading service industry. Alberta's single largest industry, however, is energy production. The province produces half of Canada's oil and most of its natural gas. Alberta also mines almost half the coal produced in Canada. Refined oil and chemicals made from oil and natural gas are among the leading manufactured products. Food and wood products are also important.

Alberta's leading crop is wheat. Alberta's farms also produce barley, alfalfa, canola,

and hay. Millions of beef cattle graze on the grasslands of the province. Farmers and ranchers also raise sheep, hogs, and horses.

History

The first American Indians to live in what is now Alberta arrived about 10,000 years ago. The first Europeans did not arrive until 1754. They came to trap animals for their fur and to trade for furs with the Indians. Employees of the two main fur-trading companies, the Hudson's Bay Company and the North West Company, explored the region and built trading posts and forts.

In 1869 the new country of Canada purchased the Hudson's Bay Company's lands, which included all of what is now Alberta. Soon the area was opened to settlers, and many ranchers came. Alberta was made part of the Northwest Territories in 1882. Settlement increased after 1883, when the Canadian Pacific Railway reached Calgary from the east. Farmers moved in after new kinds of wheat were developed that could grow in the short northern summer. In 1905 the Canadian government made Alberta a province.

In 1914 oil was discovered at Turner Valley, near Calgary. In 1947 more oil was discovered at Leduc, near Edmonton. Energy production then became more important than farming in Alberta.

► More to explore

Canada • Fur Trade • Hudson's Bay Company • Rocky Mountains

Alchemy



A painting shows three alchemists at work.

Hundreds of years ago people called alchemists tried to change lead into gold. They also tried to make potions that would allow people to live forever. Their field of study was called alchemy.

Alchemists experimented with metals, salts, acids, and other chemicals. They also developed many nonscientific and magical beliefs about the world. For instance, alchemists thought that the positions of the stars in the sky could affect their chemical experiments. Today scientists do not recognize alchemy as a science. However, some scientists believe that alchemists helped to lay the foundations for the modern science of chemistry.

In ancient times people practiced various forms of alchemy in China, India, Greece, and the Middle East. In about the 1100s people in Europe learned about some of these ancient practices. Some of them began their own experi-

ments. They tried to change lead into gold by heating it and mixing it with many other substances. They kept most of their procedures secret.

Alchemists were never able to make gold or to make people live forever. However, they made some useful discoveries. They figured out how to produce chemicals called mineral acids from other chemicals. They also learned how some chemicals react when mixed together.

► More to explore

Chemistry • Metals

Alcott, Louisa May

U.S. author Louisa May Alcott is best known for her novel *Little Women*. The book was based on her own experience growing up in a close-knit New England



Louisa May Alcott

family. It is one of several of her stories that are still cherished by young readers.

Alcott was born in Germantown, Pennsylvania, on November 29, 1832. She grew up in Boston and Concord, Massachusetts. Louisa received most of her schooling from her father, who was a teacher and philosopher. She began writing at a young age. By the 1860s her poems and stories were being published in *The Atlantic Monthly* magazine.

Alcott published *Little Women* in 1868. The book was instantly popular with younger readers, and it remains a favorite today. Alcott's other books for young readers include *Little Men* (1871) and *Jo's Boys* (1886).

Alcott spent most of the last 20 years of her life in Boston and Concord. She spent her time writing and caring for her sick parents. Alcott died in Boston on March 6, 1888.

Aleut

The Aleut are a native people of the Aleutian Islands, which are part of Alaska. They also live on the western portion of the Alaska Peninsula, a piece of land in southwestern Alaska that extends into the Pacific Ocean. The name Alaska comes from an Aleut word meaning "mainland." The Aleut are closely related to the Eskimo (Inuit).

The Aleut's early ancestors, the Paleo-Aleut, arrived in the Aleutian Islands



A young girl is one of the Aleut who still live on the islands off Alaska.

from the Alaskan mainland about 4,000 years ago. Traditionally, the Aleut lived off the sea. They fished and hunted animals such as seals, sea otters, whales, sea lions, and walruses.

The Aleut kept their traditional way of life until Russian settlers arrived in the 1700s. Conditions were harsh under Russian control, and many Aleuts died from disease or warfare. At the end of the 20th century fewer than 12,000 Aleuts lived in the United States.

► More to explore

Alaska • Eskimo

Alexander the Great

Alexander III, king of Macedonia, is known as Alexander the Great. In his

Did You Know?

The Aleut call themselves the Unanax.



A painting shows Alexander the Great dressed for battle.

short life he conquered almost all parts of the world that were known to his people.

Alexander was born in 356 BC in Pella, the capital of Macedonia, a kingdom to the north of Greece. The Greek philoso-

pher Aristotle gave him lessons. But Alexander's chief interest was war. In 338 BC Alexander's father, Philip II, brought all the Greek city-states except Sparta under his rule. Young Alexander commanded one part of the Macedonian army.

In 336 BC Philip II was killed and Alexander became king. He soon won the loyalty of nearly all of Greece. In 334 BC he brought together a large army and invaded the empire controlled by Persia. He freed the Greek settlements in Asia Minor (now Turkey) from Persian rule and made them his allies.

In 333 BC Alexander defeated King Darius III of Persia, at Issus. Alexander then marched southward along the coast of Phoenicia (present-day Lebanon). Late in 332 BC Alexander took Egypt from the Persians and became pharaoh, or king. He then controlled the whole



Did You Know?

One of the cities that Alexander founded in India was Bucephala. It was named for Alexander's horse Bucephalus.

eastern Mediterranean. Near the Nile River he founded the city of Alexandria.

In 331 BC Alexander went back into Asia and again defeated Darius. Then he was called king of Asia. Soon afterward he captured Babylon, in what is now Iraq, and Susa, the Persian capital.

Many of Alexander's men wanted to go home, but instead he had them advance further into Asia. In 327 BC Alexander went to India. There he fought his last great battle. He defeated the Indians and founded two cities. At this point Alexander's men refused to go farther. In 324 BC Alexander returned to Susa.

The next year Alexander went to Babylon. Weakened by his travels and battles, he died there of a fever. His body was eventually placed in a golden coffin in Alexandria, Egypt. His generals divided up his empire.

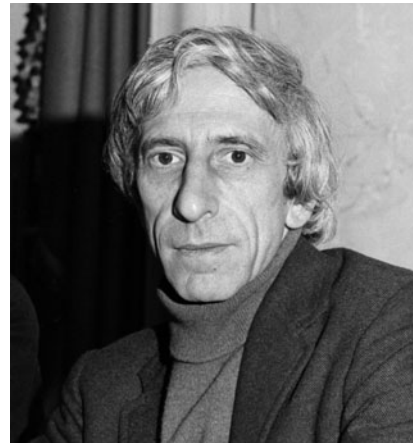
► More to explore

Alexandria • Egypt, Ancient • Greece, Ancient • Persia

Alexander, Lloyd

U.S. children's author Lloyd Alexander is probably best known for his Prydain novels. This five-book series follows a young hero named Taran from the lowly status of assistant pig keeper to the throne of the kingdom of Prydain.

Lloyd Chudley Alexander was born on January 30, 1924, in Philadelphia, Pennsylvania. As a child, he enjoyed fairy tales and mythology.



Lloyd Alexander

Alexander's first published works were a novel for adults and several books about his own experiences. His first fantasy for children was *Time Cat: The Remarkable Journeys of Jason and Gareth* (1963). He began the Prydain fantasies the following year with *The Book of Three*. The series also includes *The Black Cauldron* (1965), *The Castle of Llyr* (1966), and *Taran Wanderer* (1967). The final book of the series, *The High King* (1968), won the Newbery Medal in 1969.

Alexander created the kingdom of Westmark as the setting for another series of novels: *Westmark* (1981), *The Kestrel* (1982), and *The Beggar Queen* (1984). Alexander's later books include *The Illyrian Adventure* (1986), and *How the Cat Swallowed Thunder* (2000). He died on May 17, 2007.

Alexandria

The city of Alexandria was founded by Alexander the Great when he conquered ancient Egypt in 332 BC. For hundreds of years it was Egypt's capital. Today it is the country's main seaport. It lies on the



Few structures remain from Alexandria's early history. A monument called Pompey's Pillar and a sphinx were once part of a temple of a god called Sarapis.

coast of the Mediterranean Sea northwest of Cairo.

Alexandria has stone structures that date back to when the city was part of the Roman Empire. They include an amphitheater and Pompey's Pillar, which was built in AD 297. There are also ancient tombs called catacombs.

The chief economic activities of Alexandria include shipping, banking, and the manufacturing of cloth. The city accounts for about a third of the industrial products made in Egypt. Cotton is the main export.

Alexander the Great, the Greek conqueror, founded Alexandria as a naval base and trade center. After his death in 323 BC, control of the city passed to one of his generals, Ptolemy I Soter. Ptolemy

made Alexandria the capital of Egypt, and it soon became the most important city in the world. Greek scholars and scientists went there to study in its great library. The Pharos, a lighthouse built in Alexandria's harbor, was one of the Seven Wonders of the World.

Alexandria came under Roman rule in 30 BC and Arab rule in AD 642. The Arabs built a new capital at Cairo and neglected Alexandria. In 1517 Alexandria was conquered again, this time by the Turks. By the late 1700s it was just a small fishing village. Alexandria revived as a trade center in the 1800s after canals were built to link the city to the Nile River. Today Alexandria remains a thriving port city.

► More to explore

Alexander the Great • Cairo • Egypt
• Egypt, Ancient • Nile River

Alfred the Great

More than 1,000 years ago a king named Alfred saved part of England from falling under the control of Denmark. At the time, England was divided into several small kingdoms, and Wessex was one of those. Alfred was king of Wessex. Although the other kingdoms fell to the Danes, Alfred kept Wessex free. One of England's best-loved kings, he is known as Alfred the Great.

Battles Against the Danes

Alfred was born in 849. He was the youngest son of Aethelwulf, king of Wessex. Alfred's older brother Aethelred



Alfred the Great

became king after Aethelwulf. When Aethelred died in 871, Alfred became king.

Alfred's people were the Saxons. They had come to Britain from Germany several hundred years earlier, along with the Angles and the Jutes. All were now threatened by the Danes, who were invaders from northern Europe. The Danes were also called Vikings.

Several English kingdoms fell to the Danes. In 871 and again between 876 and 878 Alfred's Wessex forces fought against the invaders. In the end the Danish king surrendered to Alfred.

In 886 Alfred went beyond Wessex and freed London. All the English people who were not ruled by Danes then accepted him as king. Alfred's son and grandsons eventually gained control over all of England.

Role as a King

Alfred was not only a bold warrior. He was also a smart organizer who knew how to build forts, use ships, and arrange alliances. In peace he was a wise ruler who tried to protect the weak from bad judges. He also gave his people better laws.

Alfred loved learning. He read books in Latin and hired scholars to translate them into English. Sometimes he did the translating himself. The Anglo-Saxon Chronicle, a record of England's early history, was begun in his reign. Alfred died in 899.

► More to explore

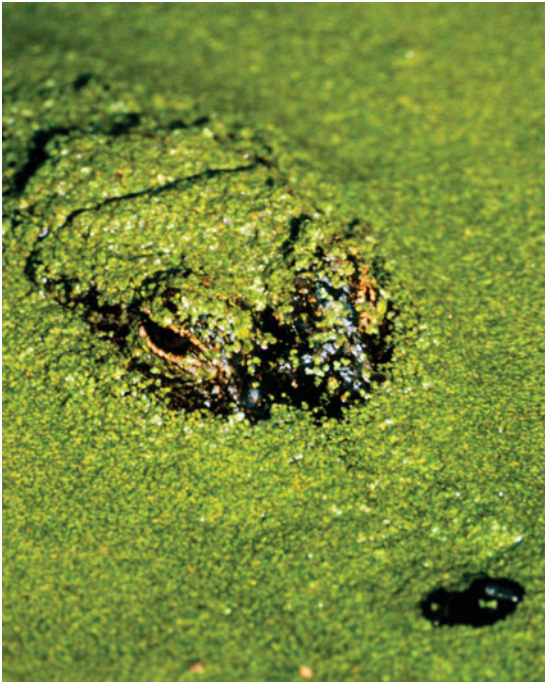
England • Vikings

Algae

Algae are organisms, or living things, that are found all over the world. Algae are very important because they make much of Earth's oxygen, which humans and other animals need to breathe.

Some algae, such as seaweeds, look like plants. However, algae are actually neither plants nor animals. Instead they belong to a group of living things called protists.

There are about 27,000 different species, or types, of algae. They are most common in water, such as oceans, rivers, lakes, streams, ponds, and marshes. Some species live in soil or on leaves, wood, and stones. Algae even grow on animals such as turtles and polar bears.



An alligator hides in algae-covered water.

Algae can be green, blue, red, or brown. They vary greatly in size. Some species are so small that they can only be seen through a microscope. On the other

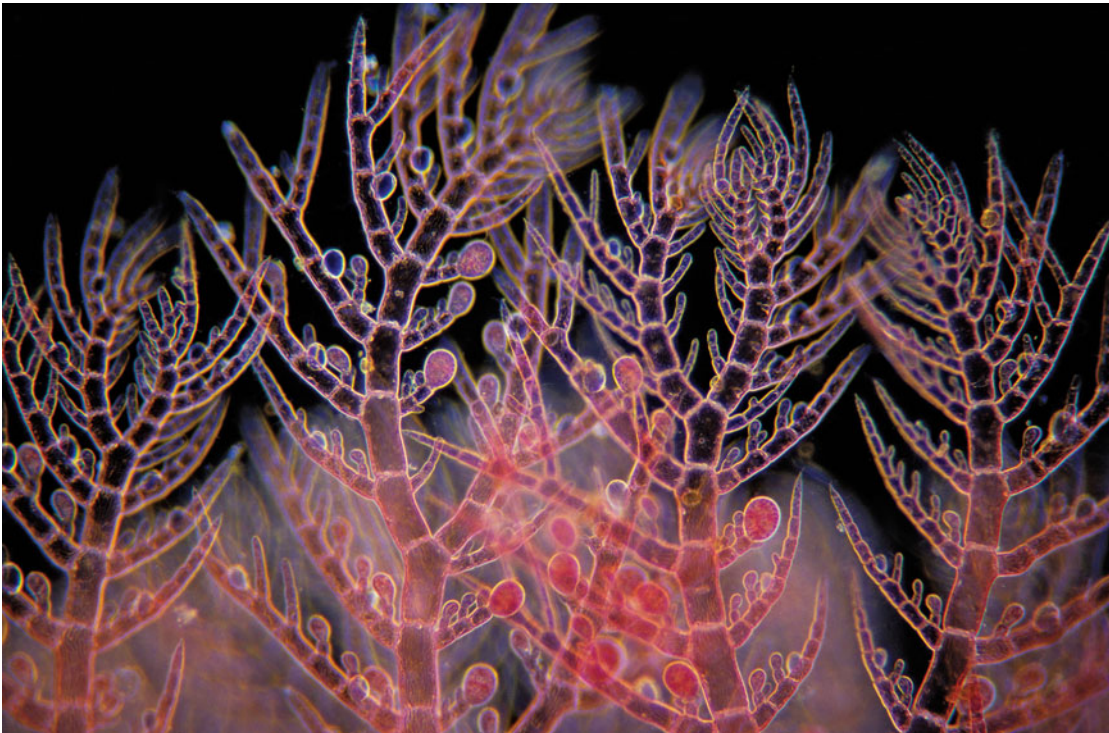
hand, the algae called kelp can reach 200 feet (60 meters) in length.

Algae differ from plants in several ways. They do not have stems or leaves, and their roots are different from plant roots. Algae also do not produce flowers or seeds, as plants do. Like plants, however, algae make their own food through a process called photosynthesis. Photosynthesis also releases oxygen into the air.

In addition to making oxygen, algae are important for other reasons. Water animals such as whales, seals, fish, octopuses, and starfish depend on algae for food. People also eat some types of algae. In many parts of the world farmers use seaweeds as fertilizer (a material to help crops grow).

► More to explore

Living Things • Protist • Photosynthesis



A magnified view of red algae shows that it looks like a plant. But algae belong to a group of living things called protists.



Algeria

Algeria is a country on the north coast of Africa. It is the second largest country on the continent. Its history, language, customs, and Islamic religion make it a part of the Arab world. The capital is Algiers.

Geography

Algeria is bordered by Tunisia, Libya, Niger, Mali, Mauritania, Western Sahara, and Morocco. The Mediterranean Sea lies to the north.

The northern part of the country is known as the Tell. Most of the people live there. The Atlas Mountains separate the Tell from the Sahara Desert, which takes up about four fifths of the country. The Sahara contains plateaus and large areas of sand called ergs. It also features Algeria's highest peak, Mount Tahat, which rises to 9,573 feet (2,918 meters).

Northern Algeria has warm, dry summers and mild, rainy winters. The



The Erg Admer is a large area of sand dunes in southern Algeria.

Sahara can be very hot or quite cold, depending on the season and time of day. It rarely rains there.

Plants and Animals

Plants in Algeria survive without much water. The Tell region has evergreen shrubs and low trees. In the desert are tufts of grass, shrubs, and acacia and jujube trees.

Hyenas, jackals, monkeys, hawks, and desert snakes are native to Algeria. So are some antelope, hares, rodents, and wild boars. Scorpions are common in the Sahara.

People

Most Algerians have Berber or Arab ancestors. The Berbers were the people who lived in North Africa before the arrival of the Arabs. Arabs now make up more than 70 percent of the population. Almost all Algerians are Muslim.





Algeria borders the Mediterranean Sea to the north. In ancient times the land was part of several different empires that stretched along the sea.

Economy

The Algerian government controls the economy. Algeria's main products are petroleum (oil) and natural gas. However, most Algerians work in the government, the military, or in agriculture. Crops include wheat, potatoes, tomatoes, barley, dates, onions, oranges, olives, and grapes. Sheep and goats are the main livestock. Manufacturers make food and tobacco products; cement, bricks, and tiles; and iron and steel products.

History

Mainly Berbers lived in ancient Algeria. Waves of invaders—Phoenicians, Carthaginians, Romans, and Vandals—conquered them at different times. Muslim Arabs invaded in the 600s and 700s. The Turkish Ottoman Empire gained control of northern Algeria in 1518. France invaded in 1830 and made Algeria a French colony.

In the 1920s Algerians began to seek more rights. In 1954 a group called the National Liberation Front (FLN) began a war against France. Algeria won independence in 1962. The FLN controlled the new government.

Algeria held its first elections in 1991. One of the parties in the election was the Islamic Salvation Front (FIS), which wanted to establish an Islamic state. When it appeared likely that the FIS would win the largest number of seats, the military canceled the elections and took over the government. That action sparked a devastating civil war. In 1999 Algerians elected Abdelaziz Bouteflika, their first nonmilitary president since 1965. However, the violence continued into the 21st century as various groups continued to protest the actions of the government.

► More to explore

Algiers • Arabs • France • Islam • Sahara

Facts About ALGERIA



Population
(2008 estimate)
34,574,000

Area
919,595 sq mi
(2,381,741 sq km)

Capital
Algiers

Form of government
Republic

Major cities
Algiers, Oran,
Constantine,
Annaba

Algiers



Population
(2004 estimate)
1,790,700

Algiers is the capital of the North African country of Algeria. It is also Algeria's largest city and chief seaport. The city lies along the Bay of Algiers.

A people called the Phoenicians created a colony in the area in ancient times. But the town was destroyed in the 400s. Another group, called the Berbers, rebuilt the town in the 900s as a center of business. It became a prosperous city in the 1600s under Turkish rule.

The French captured Algiers in 1830. They made it the headquarters for France's colonies in North and West Africa. During World War II (1939–45) Algiers was the headquarters of the Allied forces in North Africa. Groups in Algeria began rebelling against France in the 1950s. Much of the fighting took place in Algiers. After



The city of Algiers faces the Bay of Algiers.

Algeria became an independent country in 1962, Algiers grew as the country's capital.

► More to explore

Algeria

Algonquian

The Algonquians (or Algonkians) are a group of Native American tribes that traditionally spoke similar languages and had similar ways of life. The Cree, the Mohican, the Delaware (Lenni Lenape), the Ojibwa, the Shawnee, and the Algonquin are a few of the many Algonquian tribes.

The Algonquians probably once lived in southern Canada in the area north of the Saint Lawrence River. Over time they spread out, eventually occupying a large portion of what are now the United States and Canada. Their territory included New England, the Atlantic coast, the Great Lakes region, and part of the Great Plains.

Most Algonquians built their villages alongside rivers. They grew corn, beans, and squash in nearby gardens. They hunted deer, rabbits, and beaver and sometimes larger animals such as elk, moose, and bison (buffalo). They made much of their clothing from animal hides.

Most Algonquian tribes built dome-shaped houses called wigwams. Some tribes built longhouses of wood and bark that were large enough to house

several families. Others lived in cone-shaped tepees.

Religious practices varied among the Algonquians. Most tribes shared a belief in a great spirit called Manitou. They believed that Manitou was present in all things on Earth.

The Algonquians living along the Atlantic coast were among the first Indians to come in contact with settlers from Europe. They greeted the Pilgrims and the Jamestown settlers who arrived in the early 1600s. Many Algonquians died from diseases brought by the European settlers. The settlers also gradually forced the Indians to give up their land. By the mid-1800s most Algonquians were living on reservations. Thousands of people of Algonquian heritage still live in the United States and Canada.

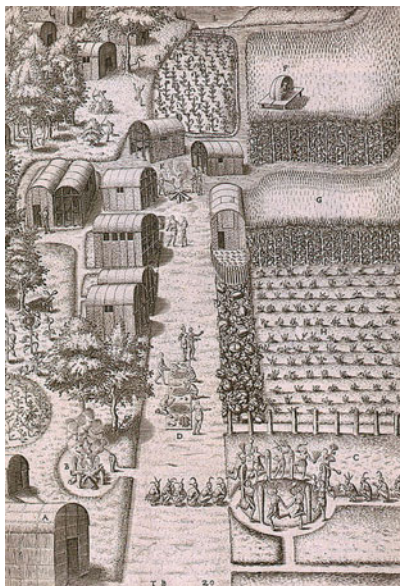
► More to explore

Algonquin • Cree • Delaware • Mohican
• Native Americans • Ojibwa • Shawnee

Algonquin

The Algonquin (or Algonkin) people traditionally lived along the Ottawa River in what is now Canada. A version of their tribal name is used to describe one of the largest Native American language groups, the Algonquians. Different groups of Algonquin spoke different Algonquian languages.

The Algonquin lived in scattered forest villages. They made their houses from wood and bark. They planted corn,



A drawing of an Algonquin village shows homes and fields of crops.

beans, and squash but got most of their food by hunting and fishing.

The French began arriving in Algonquin territory in the early 1600s. The Algonquin traded animal furs to them in exchange for European goods. This trade made the Algonquin powerful for a while. But the Huron soon replaced them as the main trading partners of the French. Warfare with the powerful Iroquois eventually drove the Algonquin from their homeland. Many Algonquin joined other tribes. Some returned to their territory once their relations with the Iroquois had improved.

After the British defeated the French in the French and Indian War (1754–63), the Algonquin became friends of the British. However, British settlers who moved into the Ottawa River valley took away much of the Algonquin land. At the end of the 20th century about 8,000

Did You Know?

Many common words that have Native American roots come from Algonquian languages. These include "moccasin," "powwow," and "tomahawk."

Algonquin lived in Canada, most of them on reserves.

► More to explore

Algonquian • French and Indian War
• Native Americans

Ali, Muhammad



Muhammad Ali fights Ernie Terrell in 1967.

U.S. boxer Muhammad Ali was a gifted athlete with a personality that brought him fans and fame. He was known for such phrases as “I am the greatest!” and “float like a butterfly, sting like a bee.”

Muhammad Ali was born on January 17, 1942, in Louisville, Kentucky. His original name was Cassius Marcellus Clay. At the age of 18 Clay won a gold medal at the Olympic Games in Rome. He became the world heavyweight champion in 1964.

In 1964 Clay joined the Nation of Islam and changed his name to Muhammad Ali. At the time the United States was fighting the Vietnam War. In 1967 Ali

refused to join the armed forces because of his religion. He was convicted of breaking the law. His title was taken from him and he was not allowed to box again until 1970. In 1971 the U.S. Supreme Court cleared Ali of all criminal charges.

In a match against George Foreman in 1974, Ali regained the world heavyweight title. In 1979 Ali announced that he would retire. He came out of retirement for matches in 1980 and 1981, but he was defeated both times. In later years Ali suffered from Parkinson’s disease, which affects the brain and the muscles.

Allegheny Mountains

The Allegheny Mountains, or the Alleghenies, extend from Pennsylvania to Virginia in the eastern United States. They are noted for their scenic beauty. At one time these mountains were an obstacle to settlers who wished to move westward.





The Allegheny Mountains become very colorful in the fall as the leaves on the trees begin to change.

The Alleghenies are part of the Appalachian Mountains. They stretch more than 500 miles (800 kilometers) and consist of two nearly parallel ridges.

At Mount Davis near the Maryland border, the Alleghenies rise to 3,213 feet (979 meters), the highest point in Pennsylvania. The highest point in West Virginia is 4,863 feet (1,482 meters), at Spruce Knob.

A large amount of coal is mined from the Allegheny range. Heavy forest cover makes the Alleghenies a rich source of timber, too.

► More to explore

Appalachian Mountains

Allen, Ethan

Ethan Allen was a patriot and a soldier. He won an important early victory in the American Revolution. Allen led a band of fighters called the Green Moun-

tain Boys against the British at Fort Ticonderoga, in what is now New York.

Ethan Allen was born on January 21, 1738, in Litchfield, Connecticut. In 1757 he fought in the French and Indian War. In 1762 Allen became an ironworker. Several years later he moved to what is now Vermont.

Vermont was not a separate colony at the time. New Hampshire and New York both claimed the territory. To aid the New Hampshire side in the dispute, Allen organized the Green Mountain Boys. (The name of Vermont comes from the French words for “green mountain.”) After the start of the American Revolution, the group fought the British.

On May 10, 1775, the Green Mountain Boys captured Fort Ticonderoga. Later that year Allen was captured by the British during an unsuccessful attack on Montreal, Canada. He was released in 1778. The Army then made him a colonel, but he fought no more in the war.



A picture from the 1800s shows Ethan Allen capturing Fort Ticonderoga.

Did You Know?

Pets are a common cause of allergies. Skin cells and saliva of cats, in particular, can cause sneezing, itching, and watery eyes.

Allen spent his later years trying to make Vermont a state. New York still wanted the territory for itself and interfered with his efforts. After the war Allen even talked with the British about making Vermont part of Canada. This hurt his reputation as an American patriot. He died on February 12, 1789, in Burlington, Vermont.

► More to explore

American Revolution • French and Indian War • Vermont

Allergy

An allergy is the human body's negative reaction to certain foreign substances. Some allergies are commonplace. Many people suffer from hay fever when pollen is in the air. Some develop skin rashes when they touch certain substances. Others experience stomach cramps after eating particular foods. When a person reacts in these ways to any outside substance, that individual is said to be allergic to it.



Sneezing is a common sign of some allergies, such as hay fever.

Allergies and the Immune System

Several things happen to cause an allergic reaction. First, a person is exposed to a substance such as pollen. The bodies of most people would simply ignore pollen. Some people's bodies, however, treat it as a harmful invader. When this happens, the person's immune system produces substances called antibodies to fight the pollen's effects.

The antibodies produced in the body tend to stay in the blood. Because of this, the immune system remembers and recognizes the specific substance that attacked the body. The next time the body comes in contact with the substance, the antibodies react to it again.

Signs of an Allergic Reaction

The antibodies react by releasing a chemical called histamine. Histamine causes fluid to build up in the body and cell tissues to swell. That is why the eyelids of a person with hay fever become red and puffy. Histamine also affects muscles. This can cause breathing difficulties or stomach cramping and pain. One severe type of allergic reaction is known as anaphylactic shock, or anaphylaxis. Some people have this reaction if they take certain drugs, eat foods such as nuts and shellfish, or get stung by certain insects. Anaphylaxis has very severe symptoms and sometimes leads to death.

Treatment

Most people quickly learn which allergies they have. When possible, they try

to avoid contact with the substance that causes the allergy. Unfortunately, substances such as dust and pollen are everywhere. Taking drugs known as antihistamines can decrease the allergic reactions. Antihistamines prevent histamine from reaching the cell tissues.

► More to explore

Asthma • Immune System

Alligator

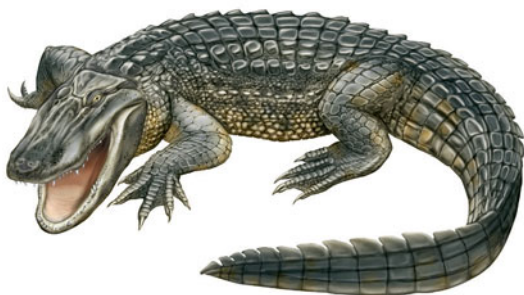
Alligators are large lizardlike animals with long, rounded snouts and powerful tails. They spend most of their time in the water, but they also travel on land. Alligators belong to the group of animals called reptiles. They are related to crocodiles.

Where Alligators Live

Alligators live along the edges of swamps, lakes, and slow-moving rivers. There are two species, or types, of alligator. The American alligator lives in the southeastern United States. The Chinese alligator lives in the Yangtze River region in China. It is very rare.

Physical Features

Male American alligators measure about 11 feet (3.4 meters) in length on aver-



American alligator

top view



alligator



crocodile

A view from above shows the different snouts of an alligator and a crocodile.

age. The females are slightly smaller. Young American alligators are black with yellow stripes on the tail. The adults are brownish.

The Chinese alligator normally grows to a length of about 5 feet (1.5 meters). It is blackish with faint yellowish markings.

Alligators have many features in common with crocodiles. They have thick skin composed of many scales and plates. They each have a long body and four short legs. The eyes, ears, and nostrils are located on top of the head. These show above the water when the animal floats.

However, there are easy ways to tell alligators and crocodiles apart. One of the most obvious is that alligators have broad, rounded snouts, while most crocodiles have narrow, pointed snouts.

Behavior

Alligators eat mainly fish, small mammals, and birds. But they sometimes kill prey as large as deer or cattle.

Alligators usually mate during the spring. The female builds a nest of mud and grass. She lays 20 to 60 white eggs in the nest. The eggs hatch after about 65 days. The young alligators live with their mother for as long as a year.

► **More to explore**

Crocodile • Reptile

Allosaurus

Allosaurus was a fierce dinosaur that roamed Earth before the similar but more well-known *Tyrannosaurus rex* appeared. The name *Allosaurus* means “other lizard.” *Allosaurus* is a member of the group of dinosaurs known as theropods. The theropods were meat-eating dinosaurs that walked on their two back legs.

When and Where *Allosaurus* Lived

Allosaurus lived about 163 to 144 million years ago. Most *Allosaurus* fossils, or remains, have been found in North America, in Colorado, Utah, New Mexico, Montana, South Dakota, and Wyoming.

Physical Features

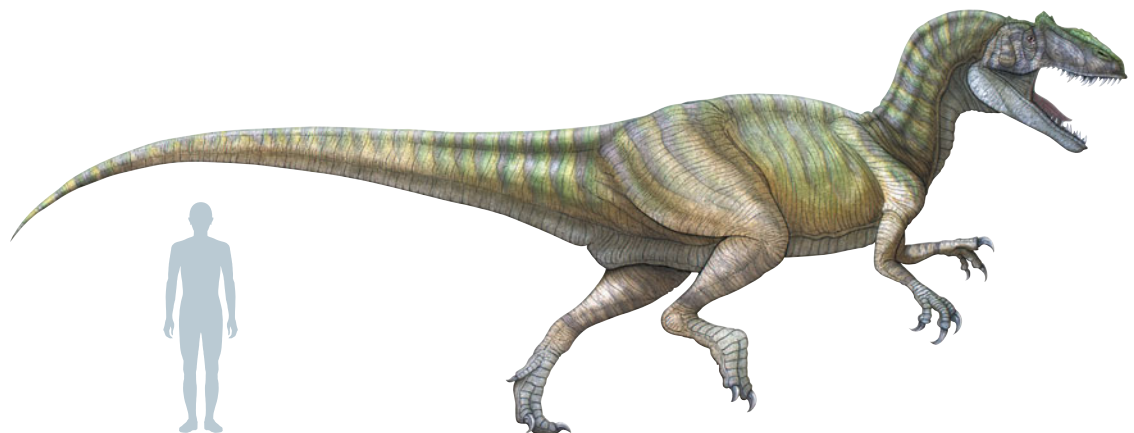
Allosaurus reached up to 39 feet (12 meters) in length, stood about 15 feet (4.5 meters) tall, and weighed up to 2 tons. The massive head of *Allosaurus* measured about 3 feet (1 meter) long and was supported by a short, thick neck. The sharp teeth of *Allosaurus* were curved and had sawlike edges. *Allosaurus* had sharp claws on the three toes of each hind foot. It also had long, grasping claws on the three toes of each front foot. The long, heavy tail of *Allosaurus* may have helped the animal balance itself.

Behavior

Allosaurus was a meat-eating dinosaur that preyed on plant-eating dinosaurs. When it hunted alone, *Allosaurus* would hide among thick plants and then jump out on its prey. Some scientists believe that *Allosaurus* also hunted in packs. Together, a pack of *Allosaurus* could bring down very large dinosaurs, such as *Apatosaurus* and *Diplodocus*. Scientists believe that *Allosaurus* reproduced by laying eggs.

► **More to explore**

Dinosaur • *Tyrannosaurus rex*



Allosaurus

Alloy

An alloy is a substance made of two or more metals or of a metal and nonmetallic materials. To make an alloy, the ingredients are melted and mixed together. When the mixture cools, it hardens.

Alloys are generally more useful than pure metals. Pure metals may rust or wear away easily. They may also be too soft to hold a shape. But mixing other substances with a pure metal often results in a hard and strong substance.

People first learned to make alloys more than 5,000 years ago. Ancient peoples used a combination of copper and tin, called bronze, to make tools and weapons. Today such things as church bells and statues are made of bronze. Brass, a combination of copper and zinc, is another ancient alloy. People today use brass to make such things as doorknobs and musical instruments.



A South American mask is made of a gold and silver alloy. Its ears and eyes are made of copper.

Steel is one of the most important modern alloys. Steel is a mixture of iron, carbon, and other substances. Steel is useful in building construction and many other industries. Another important modern alloy contains aluminum and small amounts of copper or other substances. Aircraft and other vehicles are often made of aluminum alloys.

► More to explore

Brass • Bronze • Metals • Steel

Almond

Almonds are commonly called nuts, but they are actually seeds. They come from a tree that is closely related to the peach tree. People eat almonds as a snack and also use them in cooking and baking. Almonds can also be pressed to obtain a fragrant oil.

The United States, Spain, Greece, Iran, and Turkey are major almond producers. Most almonds produced in the United States come from California.

There are two types of almonds: sweet and bitter. Sweet almonds are the kind people eat. Bitter almonds contain a poison, but their oil can be used for food after the poison is removed.

Almond trees do not grow much taller than 30 feet (9 meters). They bloom in early spring. Bitter almond blossoms are white, and sweet almond blossoms are pink. The fruits look like peaches, but they are smaller and flatter. Inside each fruit is a pit, or nut. The nut has a hard

Did You Know?

Stainless steel is an alloy that contains iron, chromium, and other metals. Stainless steel is useful because it does not rust easily.



The fruits of the almond tree open to reveal the nuts. The almond seeds are inside the hard shells.

shell surrounding a seed. The seed is the part that people eat.

As the fruit ripens, it splits open to reveal the nut. Workers use machines to shake the trees and make the nuts fall to the ground. The nuts may be left to dry on the ground, or they may be dried in an oven. Workers then use machines to shell, sort, and pack the nuts for shipment.

► More to explore

Nuts • Peach

Alphabet

An alphabet is a system used to represent language in written form. Each letter stands for a single spoken sound. Many languages use alphabets. But some languages use other systems to represent words in writing. For instance, in Japanese and Cherokee each symbol represents a group of sounds rather than a single sound. The Chinese writing system uses symbols to represent the meaning of words, not their sounds.

The Latin alphabet is the alphabet of English and most European languages. It has 26 letters. Other alphabets might have fewer or more letters. Like other alphabets, the Latin alphabet developed from earlier forms.

Early Writing Systems

People in early societies drew pictures to communicate ideas. In ancient times people in the Middle East developed the world's first writing system. It used symbols to stand for the meanings of words. Later it also used some symbols to represent the sounds of words.

More than 3,000 years ago people in what is now Syria used a simpler writing system. This system is called North Semitic. Most modern alphabets trace their history back to that system. North Semitic used only 22 symbols. It did not have any signs representing whole words. Instead each letter represented a consonant. There were no symbols for vowels. People known as the Phoenicians later slightly changed this system.



A computer keyboard has Latin and Japanese letters. It sits on top of a document written in Chinese characters.

The First Five Letters in Some Major Alphabets				
Latin	Hebrew	Arabic	Greek	Russian Cyrillic
A a	א (aleph)	ا (alif)	Α α (alpha)	А а
B b	ב (beth)	ب (ba)	Β β (beta)	Б б
C c	ג (gimel)	ت (ta)	Γ γ (gamma)	В в
D d	ד (daleth)	ث (tha)	Δ δ (delta)	Г г
E e	ה (he)	ج (jim)	Ε ε (epsilon)	Д д

Greek and Latin Alphabets

The ancient Greeks changed the Phoenician writing system to create their own alphabet. Some people consider the Greek alphabet to be the first true alphabet. This is because it has symbols for vowels and consonants. The Greek alphabet is the ancestor of all modern European alphabets, including Latin.

The ancient Romans, who spoke Latin, developed the Latin alphabet. As the Roman Empire grew, the Latin alphabet spread throughout the empire’s vast lands. It became the alphabet of many other languages in addition to Latin. The alphabet changed over time. New letters were needed to pronounce words in other languages. Other letters were combined.

Other Alphabets

The North Semitic writing system also gave rise to other ancient alphabets, including Aramaic. The modern Hebrew and Arabic alphabets developed from the Aramaic alphabet. Today people in Israel and Jews around the world use the Hebrew alphabet. People in large parts of the Middle East and North Africa use the Arabic alphabet. In Hebrew and Arabic a small group of consonants gives

the basic meaning of a word. Vowels slightly change the meaning.

The ancient Aramaic alphabet probably also influenced the earliest-known writing system of India. This system, called Brahmi, dates back more than 2,500 years. Nearly all the modern alphabets of India trace their history to Brahmi.

The Cyrillic alphabet was created more than 1,000 years ago. Members of the Eastern Orthodox church in eastern Europe used it for religious texts. The Cyrillic alphabet was based on the Greek alphabet of the time. Today people in Russia, Ukraine, Bulgaria, Serbia, and elsewhere use versions of the Cyrillic alphabet.

► More to explore

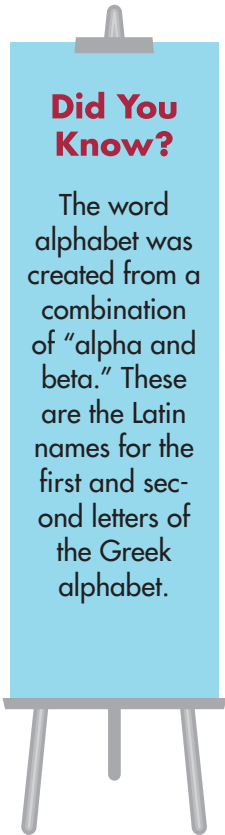
Language • Writing

Alps, The

The Alps are the youngest, highest, and most densely populated mountain range in Europe. They were formed about 44 million years ago. The Alps fill most of Switzerland and Liechtenstein and extend into France, Germany, Austria, Italy, and Slovenia. On the west, the

Did You Know?

The word alphabet was created from a combination of “alpha and beta.” These are the Latin names for the first and second letters of the Greek alphabet.





Alps run along the border between France and Italy.

The highest peak in the Alps is Mont Blanc in France, at 15,771 feet (4,807 meters). Several other high peaks are located on or near the Swiss-Italian border. They include the Matterhorn.

The Alps receive a great deal of snow and rain. At high elevations, the snow turns to ice and then flows down to the

valleys as glaciers. Sometimes masses of snow rush uncontrolled down the mountainsides. These events, called avalanches, endanger Alpine communities. The clear Alpine lakes are noted for their beauty. Among the most prominent are Lakes Geneva, Constance, Como, and Zürich.

The Alps are nearly treeless near the top, but forests grow below. The higher forests have mostly spruce, pine, and larch trees. Oak, beech, and chestnut trees grow on the valley floors and lower slopes. A few kinds of animals have adapted well to living in the higher mountains. These include the ibex, the Alpine marmot, and the mountain hare.

Humans have lived in the Alps since prehistoric times, 50,000 to 60,000 years ago. German cultures developed in the eastern Alps, while Roman culture influenced the west. Some areas of the Alps were cleared of forests during the Middle Ages (500 to 1500). Farmers settled the land, planted crops, and raised cattle. During the 1800s, railroads were constructed, opening up the area.

Many people began to travel to the Alps during the 1900s. Air, auto, and rail transportation to the Alps improved, making it easier for people to get there. Today entire villages lodge, feed, and entertain tourists. Popular resorts include Innsbruck, Austria; Grenoble, France; and Saint Moritz, Switzerland.



The Matterhorn is one of the tallest peaks in the Alps.

► More to explore

Avalanche • Europe • Mountain

Alzheimer's Disease

Alzheimer's is one of the most destructive diseases of old age. The disease destroys nerve cells in the brain. As a result, the brain stops working correctly and the memory is affected. Most people who have Alzheimer's disease are more than 60 years old. Some people, however, get it before that age.

The symptoms, or signs, of Alzheimer's disease begin mildly and then become more severe over time. At first, people with Alzheimer's seem forgetful. Gradually, they lose their entire memory. People with Alzheimer's also have a hard time speaking and understanding other people. They may not even recognize close friends and family, such as their own children. Eventually, they lose control of body and mind.

Scientists are not sure what causes the death of nerve cells in the brains of people with Alzheimer's disease. They think the cause might be a genetic defect. This means there might be a problem with one of the genes that is passed from parent to child. Because the cause is unknown, there is no way to prevent or cure Alzheimer's disease. Medications help to slow the disease in some patients.

Amazon River

The Amazon is the mightiest river in South America. It carries more water



than any other river. It is about 4,000 miles (6,400 kilometers) long. Only the Nile River in Africa is longer.

The Amazon begins in the Andes Mountains in Peru. From there it flows north and then east through Brazil. It empties into the Atlantic Ocean. The Amazon drains about one third of South America. This area includes most of Brazil and Peru and parts of Bolivia, Ecuador, Colombia, and Venezuela.

Plants and Animals

The Amazon region is the site of the world's largest rain forest. Its plant and animal life is remarkably rich. Almost three fourths of all the types of plants in the world grow there. The animals include monkeys, anteaters, anacondas, toucans, and huge rodents called capybaras. The flesh-eating piranha is among the river's many fish.

People

Millions of Brazilians live in cities in the Amazon region. Belém, Manaus, and Santarém are large, growing cities.

Did You Know?

The Amazon River carries about 10 times as much water as the Mississippi River.

At one time almost 7 million Indians lived in the Amazon region. Europeans arrived in the 1500s. They took many Indians into slavery and removed them from Brazil. Other Indians died from diseases carried by the Europeans. In the 1990s there were about 600,000 Indians in the Amazon. Most live in remote areas.

Economy

The countries of the Amazon region have encouraged businesses to use the resources found there. Mahogany, Amazonian cedar, and other trees are cut down for their wood. Rubber is another valuable plant product. Diamonds, gold, and oil are mined.

Many people have become concerned about the effects of economic development in the Amazon. Scientists warn that destroying parts of the forest threatens the plants and animals that live there.

► More to explore

Brazil • Rain Forest

Amber

Amber is a hard, yellowish, and often see-through substance that formed from tree resin. Resin is a thick fluid that oozes from pine and fir trees when their bark is injured.

The resin that formed amber came from trees that grew millions of years ago. Over time these trees and their resin became buried beneath Earth's surface. The trees eventually decayed and disappeared. But the resin hardened further, until it became amber.



Millions of years ago, insects were trapped in resin. The resin eventually hardened into amber.

Many pieces of amber contain the remains of insects or plants in the form of fossils. These living things were trapped in the resin before it hardened into amber. Scientists study these creatures to learn how living things have changed over millions of years.

People have found amber throughout the world. However, most of it comes from the shores of the Baltic Sea in northern Europe. This amber is buried in sands that are 40 million to 60 million years old.

Ancient people valued amber for its beauty. They used it to make beads and carvings. The ancient Greeks and Romans also believed that amber had magical and healing properties. Artists today turn pieces of clear amber into jewelry and other objects.

► More to explore

Fossil • Jewelry and Gems

Ambulance

An ambulance is a vehicle used to transport people who are sick or injured. Most ambulances are either trucks with space for patients or cargo vans with raised roofs. Ambulances usually take patients to a hospital.

Specially trained people called emergency medical technicians, or EMTs, ride in ambulances. They give sick or injured people emergency medical care before they reach the hospital.

Ambulances have many types of equipment that are used to move and to treat patients. Equipment for moving patients includes stretchers and cots with wheels. An ambulance's medical equipment helps to treat breathing

problems, heart attacks, broken bones, and burns right away.

Large cities have hundreds of ambulances. They are owned by public and private hospitals, fire departments, and private emergency medical services.

Some places use airplanes or helicopters as ambulances. These air ambulances have the same equipment as ground ambulances. Air ambulances reach people in out-of-the-way areas. They also transport patients more quickly than ground vehicles.

Most ambulance developments took place during wartime. In the early 1800s the French army used two-wheeled, horse-drawn wagons to bring soldiers to battlefield hospitals. In the 1860s public hospitals began keeping their own horse-drawn ambulances. The first motorized ambulance was built in 1899. Airplanes were used as ambulances for the first time during World War I (1914–18). Helicopters first served as ambulances during the Korean War (1950–53).

► More to explore

Hospital • Medicine



Emergency medical technicians treat a patient in an ambulance.

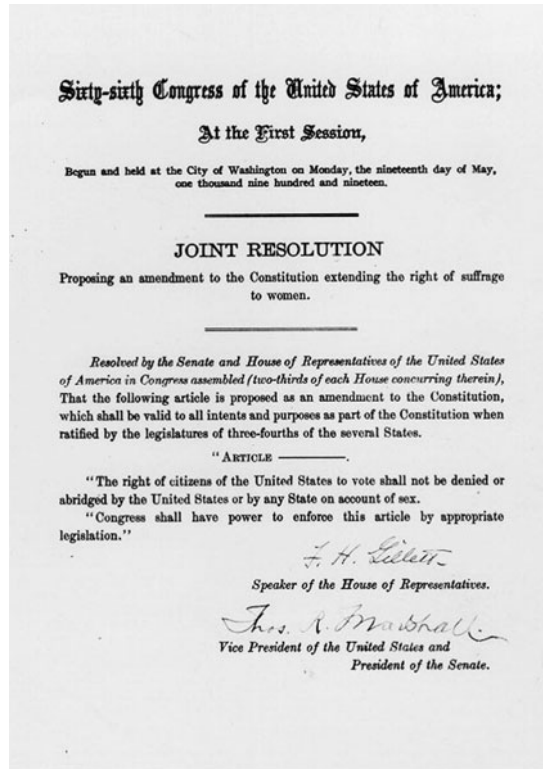
Amendment

A change or addition to a law is called an amendment. The word usually refers to a change to the constitution of a government. In the United States there have been 27 amendments to the Constitution. The most famous of these are the first 10. They are known as the Bill of Rights.

Did You Know?

The only way to repeal, or cancel, an amendment to the U.S. Constitution is to pass another amendment.

Only one amendment to the U.S. Constitution has ever been repealed.



The 19th Amendment to the U.S. Constitution gave women the right to vote.

Passing an amendment to the U.S. Constitution is a two-step process. The first step is for two thirds of the members of the Senate and two thirds of the members of the House of Representatives to vote for the amendment. The second step is for the amendment to be ratified, or approved, by the legislatures of three quarters of the states.

Every U.S. state has its own constitution, and almost all of them have been amended more times than the U.S. Constitution. The constitution of Alabama has more than 700 amendments. In many states voters must approve amendments.

► More to explore

Bill of Rights • Constitution • United States Constitution

American Civil War

In the 1860s the northern and southern parts of the United States fought the American Civil War. The war started after 11 Southern states separated themselves from the United States and formed their own government. Their army fought the forces of the U.S. government. The Civil War threatened to break up the United States. It is also called the War Between the States.

Buildup to War

The North and the South had been divided for many years over the issue of slavery. The Southern economy was based largely on cotton, which was grown on large farms called plantations. African slaves did most of the work on the plantations. The North had small farms that used paid workers. The Northern economy also relied more on manufacturing.

Neither side wanted the other's ideas to spread to new states being created in the West. Northerners wanted to stop the spread of slavery. But Southerners believed that the U.S. government did not have the right to decide whether or not slavery should be allowed in a state. They feared that the government's next step would be to stop slavery altogether.

Missouri Compromise

In 1819 the U.S. Congress had to decide whether to allow Missouri to become a state. Missouri wanted to join as a state that would allow slavery. Some North-



A map shows where the major battles of the American Civil War took place.

erners in Congress were not happy with this. Congress therefore could not agree about what to do. Finally, Maine asked to join the country as a free state, or a state that would not allow slavery. Congress then agreed to let Missouri join as a slave state and Maine join as a free state. This became known as the Missouri Compromise of 1820. The Compromise also banned slavery north of Missouri's southern border.

Kansas-Nebraska Act

The Missouri Compromise lasted until Congress passed the Kansas-Nebraska Act in 1854. The act created Kansas and Nebraska as new territories in the area

where slavery was supposed to be forbidden. Yet the act allowed the people of the territories to choose whether or not to allow slavery. In Kansas the act led to armed conflict. On one side were Southerners who supported slavery. On the other side were Northern abolitionists, who wanted to end slavery.

The Confederacy and the Union

Southerners became more upset when Abraham Lincoln was elected U.S. president in 1860. Lincoln belonged to the Republican Party, which opposed slavery. Southern states decided to secede (withdraw) from the United States to protect their right to keep slaves. South

Carolina, Mississippi, Florida, Alabama, Georgia, Louisiana, Texas, Virginia, Arkansas, North Carolina, and Tennessee seceded. They formed a government called the Confederate States of America, or the Confederacy. Jefferson Davis was the Confederate president.

Did You Know?

There were 21 million Northerners and only 9 million Southerners at the time of the American Civil War. More than one third of the Southerners were slaves.

The states that stayed loyal to the United States were called the Union. Four states—Kentucky, Missouri, Maryland, and Delaware—stayed in the Union even though they allowed slavery. They were called border states. In addition, the western counties of Virginia refused to join the Confederacy. They later joined the Union as the state of West Virginia.

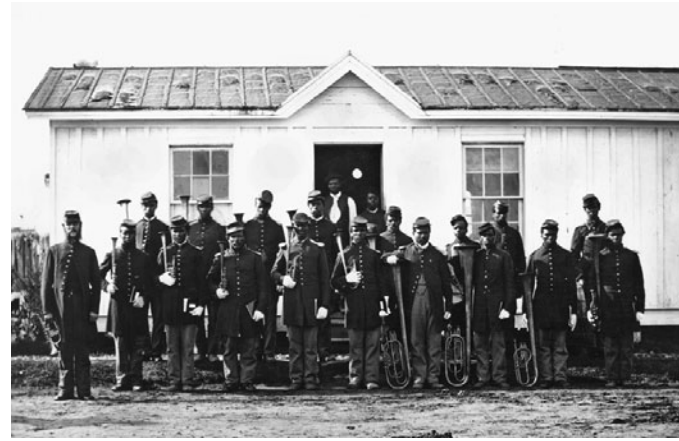
Going into the war the Union had several advantages over the Confederacy. It had more people, more industries, and more railroads. But the Confederacy had better military leaders.

Events of the War

Fighting broke out in 1861 and lasted until 1865. By the end of 1861 two major battlefronts had developed. One was in the East, where Virginia, Maryland, and Pennsylvania suffered most of the fighting. The other front was in the West. That front started along the Mississippi River and then spread.

1861

The American Civil War began on April 12, 1861, in Charleston, South Carolina. Confederate troops captured Fort Sumter from the Union Army. Afterward both sides quickly raised armies.



Many African Americans fought in the Union Army. Members of the 107th U.S. Colored Infantry pose for a photograph in Virginia in 1865.

The first major battle of the war was fought on July 21. About 30,000 Union troops marched toward the Confederate capital of Richmond, Virginia. The Confederates stopped them at a stream named Bull Run, near the town of Manassas. The Union troops were forced back to Washington, D.C. The defeat shocked the Union.

1862

Union forces had some success in the West in 1862. In February Union troops under General Ulysses S. Grant captured Confederate forts in western Tennessee. These included Fort Henry and Fort Donelson. In April Grant led the Union to victory in the battle of Shiloh, near Pittsburg Landing, Tennessee. Then the Union navy took the city of New Orleans.

The war's most notable battle at sea was fought in Virginia in March 1862. It was the first battle ever fought between ships that were covered with iron. Nei-

ther the Confederacy's *Merrimack* nor the Union's *Monitor* could win a clear victory.

General Robert E. Lee led the Confederacy to important victories in the East. In August 1862 his forces won a second battle at Bull Run. Then Lee invaded the North. Union troops stopped the Confederates at Antietam Creek, Maryland, in September. But in December Lee's troops defeated Union troops at Fredericksburg, Virginia.

1863

At the start of the war President Lincoln wanted mainly to keep the United States together. Ending slavery was not his main goal. This changed after the battle of Antietam. The Union victory encouraged Lincoln to issue a statement called the Emancipation Proclamation. The proclamation freed all slaves in Confederate states. As a result of the proclamation, many blacks joined the Union Army.

In May 1863 Lee defeated Union forces near Chancellorsville, Virginia. Then he again invaded the North. Lee suffered his first big defeat in July at Gettysburg, Pennsylvania.

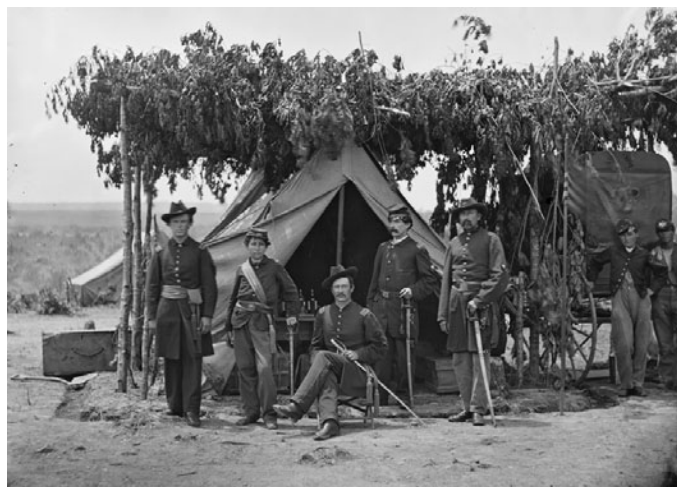
The battle of Gettysburg turned the war in favor of the Union. A day later Grant captured the city of Vicksburg, Mississippi, for the Union. Then the Union controlled the entire Mississippi River. In November 1863 Grant and General William Tecumseh Sherman drove the Confederates out of Chattanooga, Tennessee.



Confederate Generals Stonewall Jackson (left) and Robert E. Lee are pictured together in 1863. Jackson died after being wounded in the battle of Chancellorsville in that year.

1864–65

In March 1864 Lincoln rewarded Grant by giving him command of all the Union armies. While Grant fought in Virginia, Sherman went to Georgia. He captured Atlanta in September. Then he led his troops on a march to Savannah, a port on the Atlantic Ocean. Along the way they destroyed railroads and sup-



Union Army officers are photographed in Virginia in August 1865.



On April 9, 1865, General Robert E. Lee (right) surrendered to General Ulysses S. Grant at Appomattox, Virginia.

plies. Sherman captured Savannah in December.

By March 1865 Lee was very short of men and supplies. On April 3 Grant captured Richmond, the Confederate capital. He accepted Lee's surrender in Appomattox, Virginia, on April 9. By the end of May all Confederate armies had surrendered.

Reconstruction

After the war the defeated states were gradually allowed back into the United States. The South rebuilt damaged property and changed its economy so it no longer depended on slaves. This period was known as Reconstruction. It lasted until the last U.S. troops left the South in April 1877.

► More to explore

Abolitionist Movement • Confederate States of America • Davis, Jefferson • Emancipation Proclamation • Grant, Ulysses S. • Kansas-Nebraska Act • Lee, Robert E. • Lincoln, Abraham • Missouri Compromise • Reconstruction • Slavery

American Indians

► see Native Americans.

American Revolution

The American Revolution was the war in which Great Britain's 13 American colonies won their independence. The colonies became a new country, the United States. The revolution began in 1775 and ended in 1783.

Background

Before the 1760s the colonies had a lot of freedom even though they were under British rule. The British government was across the Atlantic Ocean, more than 3,000 miles (5,000 kilometers) away. The colonies had their own leaders and learned to solve their own problems. Plus, because Britain was often at war, it



The first shots of the American Revolution were fired in Lexington, Massachusetts, on April 19, 1775.

did not always pay close attention to the colonies.

In the 1760s, however, the British government tried to take more control over the colonies. One major reason for this change was the French and Indian War. Britain defeated France in the war in 1763. But the war had been very costly. Afterward, Britain decided that its American colonies should help to pay its debts.

Taxes

To raise money, Britain forced the colonies to pay new taxes. In 1765 the British lawmakers, called Parliament, passed a law called the Stamp Act. The act put a tax on legal papers, newspapers, and other printed items. The colonists protested against the tax. They were especially angry because Parliament was taxing them even though they had no representatives in Parliament. Because of the protests, the British government ended the tax in 1766.

In 1767, however, a British official named Charles Townshend got Parliament to pass several new tax laws. The Townshend Acts taxed tea, lead, paint, paper, and glass coming into colonial ports. These taxes made the colonists even angrier.

Boston Massacre and the Tea Party

To keep order, the British government sent soldiers to Boston, Massachusetts. On March 5, 1770, British soldiers fired shots into a crowd of colonists. Crispus

Attucks and several other Americans were killed. This event became known as the Boston Massacre.

On the same day as the Boston Massacre, Parliament did away with most of the Townshend Acts. They kept a tax on tea, however. Then, in 1773, Britain passed a law that allowed a British company to sell tea more cheaply than colonial merchants. On December 16, 1773, colonists boarded British ships in Boston Harbor and threw their cargo of tea into the water. This event became known as the Boston Tea Party.

Intolerable Acts

The British government then passed laws that were even harsher. The colonists called them the Intolerable Acts. The strongest of these acts closed the port of Boston until the colonists paid for the tea they had ruined. Massachusetts was put under military rule.

The colonists realized that the colonies had to act together. In 1774 representatives from every colony except Georgia met in Philadelphia, Pennsylvania. The meeting was called the Continental Congress. The representatives called on Britain to cancel the Intolerable Acts. The British government answered by sending in even more troops.

Early Battles

By this time many colonists believed that their problems with Britain could not be worked out peacefully. They prepared to fight. They formed groups of soldiers called minutemen. The minute-

Did You Know?

Patriots in different colonies kept in touch with each other through groups called Committees of Correspondence. Samuel Adams of Massachusetts started the first one in 1772.



men were to be ready to fight “at a minute’s warning.”

In April 1775 Britain sent a force to seize the colonists’ military supplies in Concord, Massachusetts. Paul Revere and William Dawes rode through the countryside to warn the colonists that the British soldiers were coming. On April 19 a group of minutemen met the British in Lexington, a town on the way to Concord. After a short fight, the British moved on to Concord. Another group of American soldiers forced them to turn back. The battles of Lexington

and Concord began the American Revolution.

The Second Continental Congress met in Philadelphia in May 1775. It brought together the military forces of the colonies to form the Continental Army. It put George Washington in charge of the army. Washington spent months preparing his troops for battle.

Meanwhile the first major battle of the war took place at Bunker Hill, near Boston. The British captured Bunker Hill on June 17, 1775. But they lost so

many soldiers that the colonists claimed victory. The battle encouraged the colonists.

Fighting for Independence

Before 1776, most colonists did not want to break free from Britain. They only wanted to get Britain to do something about their complaints. But as the fighting spread, more colonists became convinced that they had to separate from Britain. On July 4, 1776, the Continental Congress approved the Declaration of Independence. With this document, the 13 colonies became the United States of America.

The Americans struggled against the larger and better-equipped British Army. In the summer and autumn of 1776 the British forced George Washington's troops out of New York. The Americans were driven across New Jersey into Pennsylvania. But then Washington defeated the British in Trenton and Princeton, New Jersey. These victories kept the struggle for independence alive.

The turning point of the war was the battle of Saratoga, in New York. On October 17, 1777, General Horatio Gates led the Continental Army to a great victory over the British. The victory helped to bring France into the war on the side of the new United States. France sent ships and soldiers.

The winter of 1777–78 was a very hard one for the Americans. Washington and his troops camped at Valley Forge, near Philadelphia. They suffered terribly from hunger and illness. But they emerged in



British General John Burgoyne (center, in red coat) surrenders in Saratoga, New York, on October 17, 1777.

the spring as a stronger fighting force. They defeated the British in Monmouth, New Jersey, on June 28, 1778.

Final Battles

In the last years of the war most of the fighting took place in the South. In



General George Washington (right) walks through his army's camp at Valley Forge, Pennsylvania, in 1778. With him is Baron von Steuben, a German officer who helped to train the troops.



According to tradition, Molly Pitcher served bravely in the battle of Monmouth, New Jersey, on June 28, 1778.

1780 the British, led by General Charles Cornwallis, won battles in South Carolina. But in 1781 American and French forces trapped Cornwallis in Yorktown, Virginia. He surrendered on October 19, 1781. The fighting was over.

The peace treaty was signed on September 3, 1783, in Paris, France. It was called the Treaty of Paris. By signing the treaty, Britain agreed that the United States was an independent country.

► More to explore

Adams, Samuel • Attucks, Crispus
• Boston • Continental Congress
• Declaration of Independence
• Franklin, Benjamin • George III
• Jones, John Paul • Massachusetts
• Minuteman • Paine, Thomas • Revere,
Paul • United States • Washington,
George

American Sign Language

► see Sign Language.

Americas, Exploration and Settlement of the

When Christopher Columbus crossed the Atlantic Ocean in 1492, he thought he had reached eastern Asia. In fact he had opened up to Europeans a new world with two continents—North America and South America—and many islands. Many more Europeans followed Columbus to the Americas. Most were from Spain, Portugal, France, and England.

The Americas were named not for Columbus but for Amerigo Vespucci. He was an Italian merchant and explorer who took part in at least two voyages to the Americas in the late 1400s and early 1500s. Vespucci was one of the first people to realize that the land Columbus found was not a part of Asia.

Exploring by Ship

Vikings

Columbus was probably not the first European to reach America. Vikings from northern Europe traveled to the coast of what is now Canada in about AD 1000. The Vikings did not stay long, however.

Columbus

By the time of Columbus, Europeans had traveled to the East and explored many parts of Asia. Many other Europeans admired the cloths, spices, and medicines that the explorers brought back with them. They wanted more of these goods. But the voyage to Asia was long and expensive. Educated Europeans knew that the world was round. They thought that by sailing west, they could find a shorter route to Asia.

Between 1492 and 1504, Christopher Columbus made four voyages across the Atlantic Ocean. Columbus reached Central and South America as well as the islands that are now called the West Indies. He never reached Asia, but his trips inspired many others to follow.

Magellan

Ferdinand Magellan of Portugal did what Columbus had set out to do: he found a western sea route to Asia. He followed the South American coast southward from Brazil. In 1520 he passed around the tip of South America into the Pacific Ocean. Magellan died, but his crew kept sailing west. They went past the southern tip of Africa back to Spain. This was the first voyage around the world.

Later Voyages

In 1497 John Cabot, an Italian working for England, reached Newfoundland, in what is now Canada. In 1535 Jacques Cartier of France sailed from the Atlantic Ocean into Canada on the Saint Lawrence River.



John Cabot landed in what is now Newfoundland in 1497. He was one of the first Europeans to land in North America.

In 1610 the Englishman Henry Hudson sailed into the large bay in Canada that is now called Hudson Bay. Hudson was trying to find a water route through North America to the Pacific Ocean. People called this unknown route the Northwest Passage. The first explorer to find this passage was the Norwegian Roald Amundsen—in 1906.



Hudson Bay in Canada and the Hudson River in the United States were named for the explorer Henry Hudson.

Did You Know?

The Roman Catholic church sent many missionaries into Spanish, Portuguese, and French colonies. Their task was to convert the Native Americans to Catholic Christianity.

Settling the Land

The riches of the Americas attracted many early settlers, or colonists. Some worked on their own, while others worked for European trading companies. Both groups wanted to make money selling valuable things back to Europe. Gold and silver were the most valuable products of South America and Mexico. Further to the north, the furs of animals were the most valuable products.

As Europeans began settling the land, they met many Native Americans. Their relations were often friendly. But Native Americans grew angry as Europeans took over more land. Wars between settlers and Native Americans killed thousands. Many more Native Americans died from smallpox and other European diseases.

Meanwhile, European settlers began to grow the crops that Native Americans grew, including corn, potatoes, pumpkins, squash, peanuts, and tobacco. Europeans also brought plants like sugarcane and coffee to the Americas and found that they grew well there. Some Europeans set up large farms and sold their crops back to Europe.

Some of the first European farmers captured Native Americans and forced them to work as slaves. African slaves eventually replaced them. The Portuguese brought in Africans to work as slaves starting in 1502. The English were active slave traders also. The slave trade did not end until the 1800s.

Spanish Colonies

The earliest Spanish settlements were in the West Indies. The Spanish set up Santo Domingo on the island of Hispaniola in 1496. It was the first capital of Spain's colonial empire, called New Spain.



Francisco Pizarro conquered what is now Peru and founded the city of Lima there.

In 1513 Vasco de Balboa traveled across Central America. He became the first European to view the Pacific Ocean from the Americas. Six years later Hernán Cortés made his first attack on the Aztec Empire in Mexico. In 1533 Francisco Pizarro took Peru away from the Inca people. The Spanish stole gold and silver from the native empires and shipped it back to Spain.

Spain's colonial empire became the biggest in the Americas. At its peak it included the largest Caribbean islands, all of Mexico and most of Central America, large sections of South

America, Florida, and the southwestern quarter of what is now the United States.

English Colonies

The important English colonies were on the Atlantic coast of North America. In 1607 merchants from the Virginia Company founded Jamestown. This was the first permanent English settlement in North America.

Other English settlers soon founded Plymouth Colony and Massachusetts Bay Colony in New England. These colonies were unusual. The people who started them had reasons besides making money. They wanted freedom to practice their own forms of Christianity. They could not find this freedom in Europe.

The English settled other parts of the Americas, too. Starting in 1670, the English traders of the Hudson's Bay Company set up trading posts in Canada. In the Caribbean Sea, England had settlements on several islands. The largest was Jamaica, which England seized from Spain in 1655. The English



Massasoit, chief of the Wampanoag Native Americans, visits with the English settlers called Pilgrims.

settled Belize in Central America in 1638. Scattered settlements in South America united to form British Guiana in 1831.

French Colonies

France's settlements in North America were known as New France. Most of these settlements were in what is now Canada. The French explored widely, made friends with Native Americans, and built forts and trading posts. The fur trade became the basis of New France's economy. In the late 1600s and early 1700s the French captured many trading posts from the Hudson's Bay Company.

In 1608 Samuel de Champlain founded Quebec as the first permanent French settlement. One French explorer, the Sieur de La Salle, floated down the Mississippi River in 1682 and claimed all the land it drained.

France also claimed islands in the Caribbean Sea, including what is now Haiti.



Queen Elizabeth I is pictured asking English explorer Sir Walter Raleigh to start a colony in Virginia for England.



In the mid-1600s France founded French Guiana on the northeastern coast of South America.

France and England (which united with Scotland to form Great Britain in 1707) often fought over land in North America.



In 1562 French explorer Jean Ribaut brought colonists from France to North America. They landed near Saint John's River in what is now Florida.

One such fight became known as the French and Indian War. At the end of that war, in 1763, Great Britain won control of French Canada. It also won all other French territory east of the Mississippi River. France sold its territories farther west to the United States in 1803.



An illustration from 1698 depicts the last expedition of the French explorer Sieur de La Salle

Other Colonies

The Portuguese were among the earliest explorers in the Americas. However, the only colony they set up was Brazil, in South America.

In about 1626 the Dutch built a settlement in North America called New Amsterdam. The English took over New Amsterdam in 1664 and renamed it New York. The Dutch also set up colonies in the Caribbean. They are now known as the Netherlands Antilles.

Russia came to North America from the west. The Russians set up their first permanent settlement in Alaska in 1784. The Russians traded for furs as far south as California. In 1867 Russia sold Alaska to the United States.

End of Colonialism

Most colonies in North, Central, and South America became independent between 1776 and 1826. Many islands, however, remained colonies.

In 1823 President James Monroe of the United States issued a statement called the Monroe Doctrine. It declared that European countries were no longer welcome to set up colonies in the Americas.

► More to explore

Balboa, Vasco Núñez de • Cabot, John • Cartier, Jacques • Columbus, Christopher • Cortés, Hernán • Fur Trade • La Salle, Sieur de • Magellan, Ferdinand • Massachusetts Bay Colony • Native Americans • Plymouth Colony • Slavery • Vespucci, Amerigo

Did You Know?

The first colonies in the Americas to win their independence were the 13 colonies that became the United States.

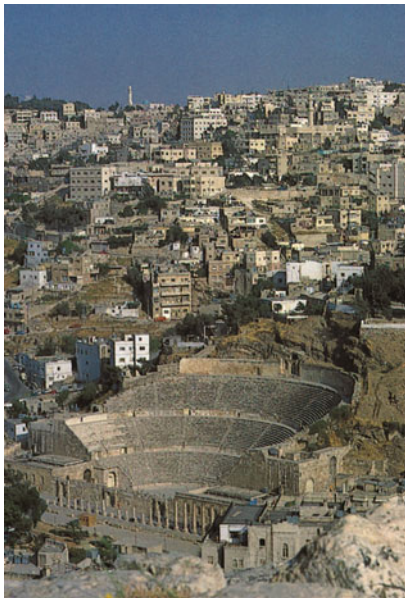
Amman



Population
(2004 estimate)
1,036,330

Amman is the capital of the Middle Eastern country of Jordan. The city spreads over a series of rolling hills. Amman is Jordan's largest city. It is also Jordan's main center of business, finance, and international trade.

People have lived in the area for thousands of years. In ancient times the city was the capital of the Ammonites, a people often mentioned in the Bible. Egypt conquered the city more than 2,000 years ago. Many other powers controlled the city over the years. But



Amman has many remains of buildings from ancient times. A theater built by the Romans almost 2,000 years ago is just one example.

for reasons that are still unknown, Amman disappeared by AD 1300.

In 1878 some people fleeing Russia created a small village in the area. Amman's revival began in 1921. That year it became the capital of a territory called Transjordan. Transjordan (now Jordan) became an independent country in 1946. After that, Amman grew rapidly.

► More to explore

Jordan

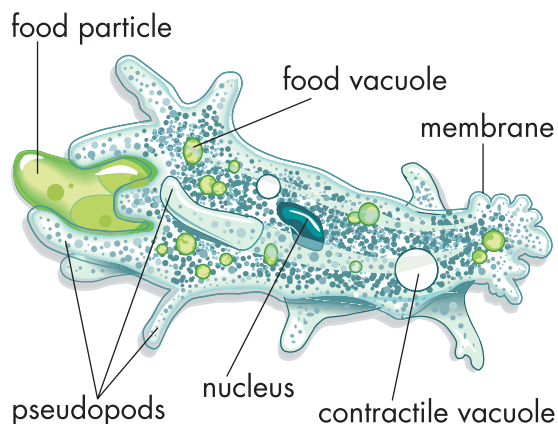
Amoeba

An amoeba is a one-celled creature that is among the simplest of all living organisms. Most amoebas are so small that they can only be seen through a microscope. There they look like tiny blobs of colorless jelly.

Amoebas are found in fresh and salt water. They also live in the moist body parts of other animals and in moist soil. At least six types of amoeba are found in human beings.

An amoeba has few parts. It has a thin covering called a membrane. Inside is a nucleus, food vacuoles, and a contractile vacuole. The food vacuoles digest food. The contractile vacuole gets rid of extra water.

Amoebas move by changing their shape. First, an amoeba extends a part of its jellylike body outward, like a stubby finger projecting out of a closed fist. This projection is called a pseudopod, or false foot. The amoeba then pours the main



part of its body into the pseudopod, which makes the pseudopod grow bigger. Eventually the pseudopod gets so big that it becomes the whole body. New pseudopods form as old ones disappear.

For food, amoebas depend mainly on plants and other one-celled animals. Amoebas use their pseudopods as mouths. The pseudopods reach out to surround the food and flow over it.

To reproduce, the nucleus of the amoeba simply splits into two pieces. The two halves pull apart, and each half takes part of the cytoplasm. In this way, a single amoeba becomes two.

Amphibian

Most of the animals known as amphibians can live on land or in water. Amphibians are vertebrates, or animals with backbones. Amphibians were the first vertebrates to appear on land. The early amphibians were the ancestors of all reptiles, birds, and mammals.

There are three basic groups of amphibians. The first group consists of frogs

and toads. The second group consists of salamanders, including newts and mud puppies. The third group is made up of wormlike creatures called caecilians. Altogether there are more than 4,000 species, or types, of amphibian.

Where Amphibians Live

Amphibians are found nearly all over the world. They are most common in hot, humid areas such as the tropics. Some adult amphibians live only on land. Other types live only in water. However, most amphibians spend part of the time on land and part of the time in water.

Physical Features

Most amphibians are relatively small. However, they vary greatly in length, from less than 0.4 inch (1 centimeter) to more than 60 inches (150 centimeters).

Amphibians do not have hair or feathers. Their skin takes in oxygen. In other words, amphibians breathe through their skin. Most kinds also breathe through lungs or organs called gills.

Amphibian skin takes in water, too. Most amphibians have moist skin. In most species, if the skin dries up, the animal soon dies. The skin often contains glands that make a slimy fluid called mucus. Mucus helps protect the skin from drying out.

Many amphibians also have glands in the skin that make poison. This helps protect an amphibian from other animals that want to eat it. For example, poison may make the amphibian taste bad or hurt the predator's mouth.

Did You Know?

Some amphibians change their skin color to blend in with their surroundings. This makes them harder for enemies to see.



Tree frogs, such as the green tree frog, have special sticky feet that help them climb trees.

Frogs and Toads

Adult frogs and toads are tailless. Their eyes are large and well developed. They have short, thick bodies and four legs. Frogs use their long, powerful back legs for leaping and swimming. Toads have shorter back legs than frogs do. They walk or hop about. Unlike other amphibians, toads have skin that is often dry, with bumps that look like warts.

Salamanders

Salamanders have long tails. Most salamanders have a small head, a short body, and four legs. If a salamander loses its tail or a leg, it can usually grow a new one.

Caecilians

Caecilians look like worms or snakes. They have long, slender bodies with no arms or legs. Skin or bone covers their eyes, so the animals are blind or nearly blind. Most kinds live underground, where they tunnel about.

Behavior

Amphibians are cold-blooded. This means that their body temperature is always about the same as the temperature of their surroundings. If their environment gets too hot or cold, amphibians move to another place to become more comfortable. For instance, a frog may move from the shade into the sunshine to warm its body.

During cold winters some amphibians become very inactive for months. They enter a resting state called hibernation. They become active again when it gets warmer. Some amphibians also become inactive during hot, dry summers.

Adult amphibians eat a wide variety of foods. Frogs, toads, and salamanders eat mainly small boneless animals such as



Salamanders (top) have smooth, wet skin, like frogs' skin. Caecilians (bottom) are amphibians that look like worms.

insects, worms, and spiders. Some large salamanders and frogs eat small birds and mammals. Most caecilians eat worms.

Life Cycle

Most amphibians lay eggs, but some species give birth to live young. In most egg-laying species, the female deposits a large number of eggs in the water.

The life cycle of most amphibians is divided into two phases. In the first phase the amphibian lives in the water in an immature form called the larva. In frogs and toads the larva is also called a tadpole. The larva begins life with gills, which allow it to breathe underwater like a fish. The larva stage may last from several weeks to five years, depending on the species.

In the second phase the larva develops into the adult form. In most species, the animal loses its gills and develops lungs. It is then capable of living on land at least part of the time. The animal's body structure may change in many other ways, too. For example, a tadpole grows legs and loses its tail. The change from larva to adult is called metamorphosis.

However, some species do not have separate larva and adult forms. They are born in the same form as adults, only smaller.

► More to explore

Animal • Frog • Hibernation
• Metamorphosis • Poison • Salamander
• Toad

Amsterdam



Population

(2008 estimate), urban area,
1,482,287

Amsterdam is the largest city in The Netherlands, a country in northwestern Europe. It is the official capital of The Netherlands. However, the government offices are in the city of The Hague.

Amsterdam is a historical city as well as the country's major economic center. It is also famous as a place of freedom and tolerance. Tourists go to Amsterdam to see its scenic canals and collections of great art. Museums in the city display the works of important artists from The Netherlands, including Rembrandt and Vincent van Gogh.

The Amstel River flows through Amsterdam. The city also lies on a body of



A boat travels down a canal in Amsterdam.

water called the IJ (pronounced “eye”). A canal connects the IJ with the North Sea. Amsterdam is a major port.

Part of Amsterdam’s land used to be underwater, but people drained the land. A system of pumps, barriers, and canals keeps the water from rushing in again. Boats travel through the city along a cobweb pattern of canals. More than 1,000 bridges provide land connections over the canals.

Economy

For seven centuries Amsterdam has been a center of international trade and transportation. Other important industries include banking, insurance, and tourism. Industries that provide services to businesses also bring money to the city.

History

Amsterdam began as a fishing village in the 1200s. By the 1400s it was an important port.

During the 1500s many Jews and Protestants fled religious wars in other parts of Europe. Many settled in Amsterdam because it was known for its religious freedom.

The 1600s were Amsterdam’s golden age. The city grew wealthy as a center of trade and banking. Amsterdam declined somewhat in the 1700s.

Nazi troops from Germany controlled Amsterdam in the 1940s, during World War II. The Nazis murdered most of Amsterdam’s Jews.

After the war Amsterdam began to thrive again. Its economy grew greatly in the late 20th century.

► More to explore

Canal • Hague, The • Netherlands, The
• Rembrandt • Van Gogh, Vincent

Amundsen, Roald



Roald Amundsen

The Norwegian explorer Roald Amundsen was one of the most important people in the history of polar exploration. He traveled to both the Arctic and the Antarctic, and he was the first person to reach the South Pole.

Roald Engelbregt Gravning Amundsen was born in Borge, Norway, on July 16, 1872. His father, a shipowner, died when Roald was 14. Young Amundsen always wanted to be a polar explorer, but to please his mother he studied medi-

Did You Know?

A young Jewish girl named Anne Frank and her family hid from the Nazis in Amsterdam for two years. The building where they hid is now a museum.

cine. When his mother died, Amundsen left school and went to sea.

At age 25 Amundsen made his first voyage to the Antarctic, as part of a Belgian expedition. Then in 1903 he set out with his own ship and crew to explore the Arctic. By the end of this expedition, in 1906, Amundsen had become the first navigator to find his way through the Northwest Passage from the Atlantic to the Pacific Ocean. This had been a dream of explorers for 400 years.

In 1909 the explorers Robert Peary and Matthew Henson became the first people to reach the North Pole. Amundsen then decided to try to be the first to reach the South Pole. He set out with four men, 52 dogs, and four sleds and reached the pole on December 14, 1911.

In 1918 Amundsen tried to drift across the North Pole in a boat, but the ice was too thick. In 1926, with two companions, Amundsen flew over the North Pole in a dirigible, a lighter-than-air craft. Amundsen died near the Arctic island of Spitsbergen on June 18, 1928.

► More to explore

Henson, Matthew • Northwest Passage
• Peary, Robert E. • Polar Exploration

Anaconda

Anacondas are huge, nonpoisonous snakes. They live in or near water in warm parts of South America. Anacondas are constrictors. This means that



The giant anaconda is one of the largest snakes in the world.

they usually kill their prey by coiling their body around it and squeezing until the animal can no longer breathe. Anacondas are one of the two largest types of snakes in the world. Certain pythons grow longer, but anacondas are much heavier.

Anacondas are members of the boa family. There are two species, or types, of anaconda: the giant, or green, anaconda and the yellow, or southern, anaconda. The giant anaconda is the larger species. It is usually brown or olive green with oval-shaped black spots. The yellow anaconda is tan or greenish yellow with overlapping black spots.

The largest anacondas reach about 30 feet (9 meters) in length, but most grow only to about 16 feet (5 meters). Some anacondas weigh as much as 550 pounds (249 kilograms). Their thick, bulky bodies may measure 12 inches (30 centimeters) or more around.

Anacondas usually hunt at night for mammals, reptiles, and birds. Although

anacondas constrict larger prey, they may kill turtles, birds, or other small animals by using their mouth and sharp teeth alone. Sometimes they may pull their prey underwater to drown it. After killing their prey, anacondas swallow it whole.

Nine months after mating, female anacondas give birth to large litters of live young. A litter has 14 to 82 young. Each young measures more than 2 feet (0.6 meter) long.

► More to explore

Boa Constrictor • Python • Snake

Anasazi

The Anasazi were a Native American people whose civilization developed beginning in about AD 100. They are also known as the Cliff Dwellers because of the great buildings they constructed along the sides of cliffs. They lived in the area where the present-day states of Arizona, New Mexico, Colorado, and Utah meet.



Cliff Palace is an ancient Anasazi building at Mesa Verde National Park in Colorado.

Early Anasazi houses were underground pits lined with stone walls. In time, these pit houses developed into kivas, or structures where religious ceremonies were performed. Then the Anasazi began to live aboveground in simple, one-story houses made from mud and wood or stone.

Probably by about the mid-800s, the Anasazi began constructing multistoried structures that resembled modern apartment buildings. The Anasazi built some of these buildings into the sides of cliffs, where they were difficult for their enemies to attack.

The earliest Anasazi survived by hunting and gathering wild plants. By about 700, however, they had learned to grow corn, beans, squash, and other crops. As their farming methods improved, their food supply grew. Their population grew, too, and they built large permanent settlements.

No one knows why, but by about 1300 the Anasazi had mostly abandoned their multistoried buildings. They broke into smaller groups and moved south and east where they built new villages.

The Anasazi's descendants are the Pueblo Indians. They established smaller villages, mostly clustered in the Rio Grande Valley of New Mexico and Arizona. At the end of the 20th century there were about 60,000 Pueblo Indians living in the United States.

► More to explore

Native Americans • Pueblo Indians

Anatomy

Anatomy is the study of the structures that make up the bodies of living things. It is a branch of the science of biology.

Scientists learn about body structures mainly by dissecting, or cutting apart, bodies. They may dissect human or animal bodies, plants, or other life-forms such as bacteria. Scientists identify the structures inside the life-form and how they are put together.

Importance of Anatomy

Scientists study anatomy to learn about the size, shape, and position of different body parts—for example, the skin, muscles, bones, and organs of humans. The study of human anatomy is important in medicine. Medical students learn how the parts of a healthy human body fit together and

how they function. This helps them treat bodies that are not functioning properly.

Scientists also compare the anatomies of different types of living things. They observe the similarities and differences of their structures. This helps them determine how different types of living things are related to one another and how they developed over time.

History

An ancient Greek doctor named Herophilus is often called the Father of Anatomy. He performed dissections of human bodies, sometimes in public, in about the 300s BC. The ancient Greek doctor Galen later wrote many books about human anatomy. They were a major source of anatomy information in Europe for centuries. However, they contained many errors. Many of his ideas were not based on direct observations of the human body.

The modern science of anatomy began to develop in the 1500s. In 1543 a doctor named Andreas Vesalius wrote the first detailed and illustrated anatomy textbook based on observed facts. He performed careful dissections of human bodies in order to study them.

The first powerful microscopes were developed in the late 1600s. These instruments allow scientists to study tiny structures in the body such as cells and their parts. As technology has improved

Did You Know?

The most famous book about human anatomy is called *Gray's Anatomy*. Henry Gray wrote the first edition in 1858. Other scientists have kept it up to date.



Students study a model of a human body. Anatomy models can help students understand how the human body is made up and how its different parts work together.

over the years, scientists have been able to learn more and more about anatomy.

► **More to explore**

Biology • Medicine • Microscope

Andersen, Hans Christian



A girl feeds the ducklings in an illustration for the story "The Ugly Duckling."

The fairy tales of Hans Christian Andersen are popular today, just as they were when first published in Denmark in the mid-1800s. His stories include such favorites as "The Ugly Duckling" and "The Emperor's New Clothes."

Hans Christian Andersen was born on April 2, 1805, in a Danish fishing village called Odense. Andersen's family was very poor. As a boy, he attended school only occasionally. He visited the theater and found that he loved performing. When Andersen was 11 years old, his

father died. Shortly after that, Andersen began working in various trades.

At age 14 Andersen moved to Copenhagen, the capital of Denmark, to try to become an actor or dancer. But he did not have much success. Andersen later studied at the University of Copenhagen.

Andersen's first collection of tales for young people was published in 1835. It included the story "The Princess and the Pea." Andersen wrote his tales as if they were being told out loud, often using expressions that people heard every day. He also drew on his own experiences to create characters who were poor or even outcasts. During his long writing career, he wrote more than 200 stories. Andersen also spent much time traveling throughout Europe, Asia, and Africa, and he wrote several travel books. He wrote plays, poems, and novels, too. Andersen died on August 4, 1875, in Copenhagen.

Anderson, Marian

The singer Marian Anderson had a pure, rich voice and could sing a great range of parts. An African American, she is also remembered for breaking down barriers between blacks and whites in the United States.

Anderson was born on February 27, 1897, in Philadelphia, Pennsylvania. At age 6 she began singing in her church choir. At age 19 she studied singing with a famous teacher who was so



Marian Anderson sings at the Lincoln Memorial in Washington, D.C.

impressed by her talent that he gave her free lessons.

In 1925 Anderson gave a recital with the New York Philharmonic Orchestra. But because of her skin color, many opportunities were closed to her in the United States, where at the time blacks and whites were often kept apart. Audiences in other countries embraced Anderson, however. In the 1930s she made successful singing tours of Europe.

In 1939 Anderson was prevented from arranging a concert in Washington, D.C., because blacks were not allowed in the concert hall. Many Americans, including First Lady Eleanor Roosevelt, were outraged. They arranged for her to sing outside the Lincoln Memorial instead, and 75,000 people came to hear her.

In 1955 Anderson became the first African American to perform with the renowned Metropolitan Opera in New York City. Two years later she published *My Lord, What a Morning*, the story of

her life. Anderson died on April 8, 1993, in Portland, Oregon.

► More to explore

African Americans • Opera

Andes

The Andes Mountains of South America are the longest mountain chain in the world. The chain also contains the highest mountains in the Americas. The Andes were settled long ago by American Indian peoples. They continue to attract interest today because of their mineral wealth.

Features

The Andes Mountains stretch from north to south along the entire western side of South America. They separate a narrow strip of land along the Pacific Ocean from the rest of the continent. The Andes are



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about 5,500 miles (8,900 kilometers) long and in most places are no wider than 200 miles (320 kilometers).

Many Andean peaks are higher than any mountains in North America. At 22,831 feet (6,959 meters), Argentina's Mount Aconcagua is the highest mountain anywhere in the world outside Asia.

Plants and Animals

Plant and animal life in the Andes varies based on height and climate. The highest peaks and some very dry places have very few plants. But rainy parts of the eastern Andes have lush tropical forests. Animals of the Andes include pumas, chinchillas, and several relatives of the camel, including llamas, guanacos, and alpacas. The Andean condor is a vulture that is one of the world's largest flying birds.

People

Humans first settled in the Andes more than 10,000 years ago. Indian peoples such as the Inca established cities in high valleys and built roads through mountain passes. Most people in the Andean region even today have at least some Indian ancestors.

Most of the people of the mountains are involved in farming. Most crops are grown for use within the region, but some are exported. Increasing numbers of people have also become involved in mining. The Andean region is one of the world's richest sources of minerals. Copper, iron ore, tin, lead, zinc, silver, gold, platinum, and emeralds are all produced in the Andes, especially in the south.

► More to explore

Inca • Mountain • South America



Mount Fitzroy, or El Chaltén, is part of the southern Andes Mountains. It rises above a plain in the Patagonia region of Argentina.

Andorra

The European country of Andorra is one of the smallest in the world. The capital is Andorra la Vella.

Geography

Andorra lies in the southern Pyrenees Mountains between Spain and France. The Valira River runs through its valleys. Andorra has a number of natural sources of hot water called thermal springs.

The climate of Andorra is generally dry. It has cold, snowy winters and warm summers.

Plants and Animals

Pines and firs grow in Andorra's mountains, where chamois (goatlike animals) and birds of prey also live. Andorra has reintroduced several threatened animals, including species of trout and deer, to their former habitats. Wild boars and weasels are other native animals.



People

Most Andorrans are of Spanish origin and Roman Catholic. Catalan, a language of eastern Spain, is the official language. Andorrans also speak Spanish and French. Only about one third of the people are Andorran citizens. The rest are mostly citizens of Spain, France, or Portugal.

Economy

Tourism, banking, trade, and construction are the most important parts of Andorra's economy. Some tourists visit the medieval churches, castles, and bridges. Others come for skiing and other winter sports.

Manufacturers in Andorra make electrical equipment, cars and car parts, newspapers, and clothes. A few farmers raise tobacco, hay, potatoes, and sheep.

History

The emperor Charlemagne captured Andorra from the Muslims in AD 803. It later passed to the Spanish bishops of the town of Urgel. In the late 1200s Andorra became a coprincipality, a land governed by two princes: the bishop of Urgel and the leader of France. In 1993 Andorrans voted for a new constitution that gave more power to their legislature, the General Council.

► More to explore

Andorra la Vella • Charlemagne • France
• Pyrenees • Spain



Facts About ANDORRA



Population
(2008 estimate)
84,100

Area
179 sq mi (464 sq km)

Capital
Andorra la Vella

Form of government
Parliamentary coprincipality

Major urban areas
Andorra la Vella,
Les Escaldes-
Engordany,
Encamp

Andorra la Vella



Population
(2008 estimate)
24,574

Andorra la Vella is the capital of the tiny western European country of Andorra. The town lies in a valley of the Pyrenees Mountains.

Andorra la Vella is popular with tourists because of its scenic beauty and winter sports areas. It is also a retail shopping center for goods from Asia and other parts of Europe.

Andorra la Vella was long isolated from the outside world. Roads built in the 1930s helped make it more modern. In the second half of the 1900s the town's population grew along with its industries.



Andorra la Vella sits in a mountain valley. One of the main tourist sites in the city is the Casa de la Vall. It is where Andorra's legislature meets.

Angkor Wat

A temple dating back to the 1100s, Angkor Wat is located in Cambodia. It is the world's largest religious structure.

Physical Features

Angkor Wat is about 5,100 feet (1,554 meters) long and 4,498 feet (1,371 meters) wide. It is surrounded by a wall and a moat. Of its original nine towers, five still stand.

The temple was originally dedicated to the Hindu god Vishnu. Carvings illustrate Hindu legends and glorify the king who ordered the temple built. Sculptures portray him as Vishnu or show him performing kingly functions. Many Hindu images were later replaced by Buddhist art.

History

From the 800s to the 1400s the city of Angkor was the capital of a powerful Cambodian kingdom called the Khmer Empire. Angkor Wat is the most famous of the city's temples. The Khmer started building the temple during the reign of King Suryavarman II, which lasted from about 1113 to 1150. It was not finished until after his death. In 1177 Angkor was looted by invaders. The next king decided that the Hindu gods had failed. He made Angkor Wat a Buddhist shrine.

The city of Angkor was abandoned in the 1400s. However, Angkor Wat itself was maintained by Buddhist monks as a



Buddhist monks walk toward the main temple building at Angkor Wat.

pilgrimage site. Even so, parts of it were damaged by plant roots or worn away by water.

► More to explore

Buddhism • Cambodia • Hinduism
• Monk • Pilgrimage

Anglo-Saxon

Hundreds of years ago people known as the Anglo-Saxons lived in and ruled England. They were descendants of three different peoples. The Angles and Saxons came from different parts of what is now Germany, and the Jutes came from Jutland, a part of Denmark.

In the 400s the Celtic Britons who were living in England asked the Angles, Saxons, and Jutes to protect them from fierce tribes in the north. In return for their services the Angles, Saxons, and Jutes were given land. Gradually they became more powerful and pushed the

Britons aside. They became the rulers of the land.

Eventually the name Anglo-Saxon came to be used for all people living in England, as the Angles, Saxons, and Jutes mixed with other invaders and the original Britons. The Anglo-Saxons spoke an early form of English that is now called Old English. They lived in houses made of wood, thatch (straw), and twigs woven together and covered with mud or clay. When the mud or clay hardened it made a solid roof or wall. Anglo-Saxons fed themselves by farming. They harvested grains, fruits, and vegetables and raised livestock.

Anglo-Saxon rule ended in 1066. In that year England was conquered by the French forces of William, duke of Normandy, during what is known as the Norman Conquest.

► More to explore

England • Norman Conquest



A rare gold coin shows an Anglo-Saxon king.



Angola

The country of Angola lies on the southwestern coast of Africa. After about 500 years as a colony of Portugal, Angola suffered decades of civil war beginning in 1975. The capital and largest city is Luanda.

Geography

Angola is bordered by Congo, the Democratic Republic of the Congo, Zambia, and Namibia. The Atlantic Ocean lies to the west. The small oil-rich area of Cabinda is separated from the rest of Angola by a strip of the Democratic Republic of the Congo.

A plateau, or raised land, covers the eastern two thirds of Angola. Mountains separate the plateau from the coast. Lowlands lie along the coast and near the Congo River.

Angola has a warm, tropical climate, with a rainy season that lasts from Octo-



Houses with thatched roofs line a hillside in Angola.

ber to mid-May. The southwest is dry, while the northeast is humid.

Plants and Animals

Rain forests once covered Angola, but loggers and farmers cut down many of the trees. Angola now has many savannas, or grasslands with scattered trees.

Civil war and hunting have endangered many animals, including African elephants, black rhinoceroses, giant sable antelopes, and Angolan giraffes. Angola also has leopards, lions, hyenas, elephants, hippopotamuses, zebras, and buffalo. Many birds and a wide variety of reptiles, including crocodiles, live there, too.

People

Bantu peoples make up most of Angola's population. The two largest groups are the Ovimbundu and the Mbundu. Groups of San live in the southeast. Portuguese is the official language. How-





Masks from Angola are on display at a museum.

ever, the people speak such local Bantu languages as Umbundu, Kimbundu, and others. Traditional religions have largely given way to Christianity. A majority of the Christians are Roman Catholics.

Economy

Angola's economy is based on its natural resources of petroleum (oil), natural gas, and diamonds. Agriculture, fishing, and manufacturing play smaller roles in the economy. Farmers raise cassava, corn, sugarcane, sweet potatoes, bananas, cattle, and goats. Manufacturers make food products, beer, shoes, and fabric.

History

Ancient peoples in what is now Angola practiced ironworking and agriculture.

Eventually Bantu peoples set up a number of kingdoms. The most powerful of these was the Kongo kingdom around the Congo River. It was founded in the 1300s.

Portuguese explorers arrived in 1483. The Kongo kingdom traded ivory, hides, and slaves for European firearms. By the early 1600s Portugal was exporting 5,000 to 10,000 slaves from Luanda every year, especially to Brazil. Portugal slowly expanded its control of Angola. Some Angolan leaders fought the Portuguese, but others worked with them. Portugal continued the slave trade in Angola until the mid-1800s.

In 1961 Angolans took up arms against Portugal, and violent fighting lasted for 14 years. The two main independence groups were the Popular Movement for the Liberation of Angola (MPLA) and the National Union for the Total Independence of Angola (UNITA). Cuban troops and Soviet arms supported the MPLA, while South Africa and the United States provided aid to UNITA.

Angola won independence in 1975. The MPLA gained control of the government. UNITA challenged its power, however, and fighting broke out. A devastating civil war lasted until the leader of UNITA died in 2002. After that, the MPLA had firm control of Angola. The country slowly rebuilt from the war.

► More to explore

Africa • Luanda • Portugal • Slavery

Facts About ANGOLA



Population
(2008 estimate)
12,531,000

Area
481,354 sq mi
(1,246,700 sq km)

Capital
Luanda

Form of government
Republic

Major cities
Luanda, Huambo, Lobito, Benguela, Namibe

Animal

Animals are living things. Like plants, animals need food and water to live. Unlike plants, which make their own food, animals feed themselves by eating plants or other animals. Animals can also sense what goes on around them. Their bodies allow them to move in reaction to their surroundings. They use their senses and movement to find food, mates, and safety.

Millions of different kinds of animals live on Earth. Animals are found throughout the world, from the freezing polar zones to the hottest deserts. They live on land and in the water. They come in a huge variety of shapes and sizes.

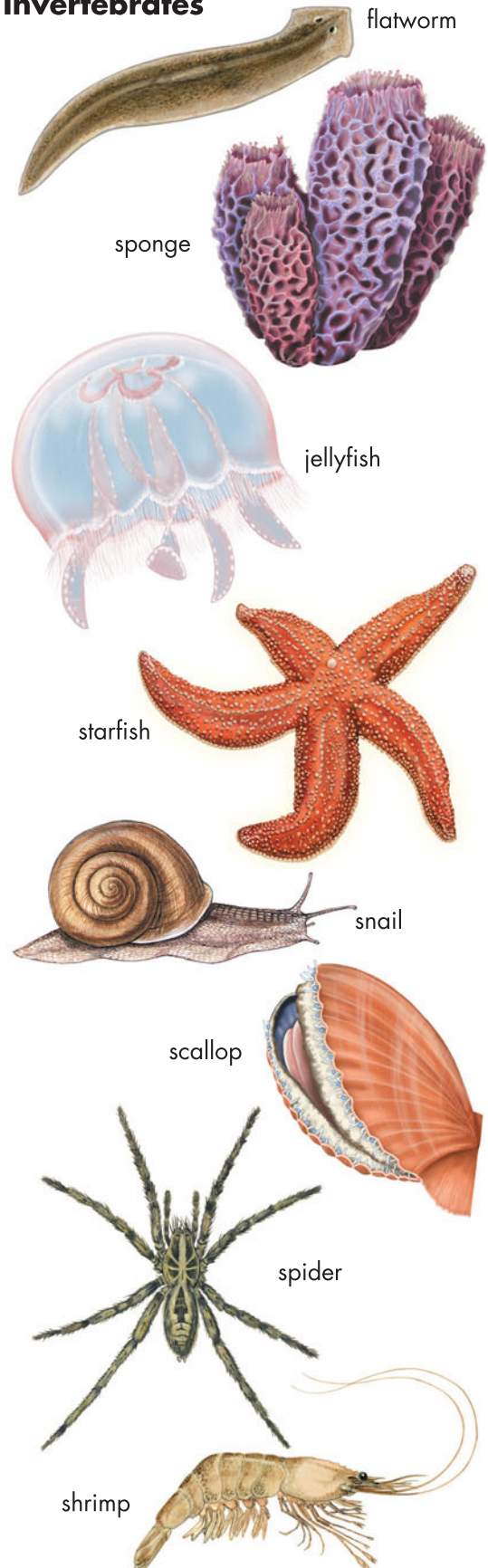
Scientists divide animals into two main groups. Animals that have a backbone are called vertebrates. Animals that do not have a backbone are called invertebrates. About 95 percent of all animals are invertebrates.

Invertebrates

Some invertebrates have a soft, unprotected body—for example, sponges, jellyfish, and worms. Most soft-bodied invertebrates have no legs. Many live in water, but some worms live on land.

Other invertebrates have a covering to protect their body. Animals called echinoderms—for example, starfish and sea urchins—have tough skin covered in stiff points. These animals all live in oceans. Many mollusks, including oysters and snails, have a hard shell around

Invertebrates



their soft body. Some mollusks live on land, but many live in water.

Invertebrates with jointed legs are called arthropods. They have a hard covering called an exoskeleton. Insects, spiders, crustaceans, and centipedes are all arthropods. Arthropods live on land and in water all over the world.

Vertebrates

Fish are the oldest known vertebrates. They live in water and are often covered in scales. Most fish have a bony skeleton. However, sharks and rays have a skeleton made of cartilage, a strong and flexible tissue.

Animals that live part of their life on land and part of their life in water are called amphibians. Frogs and salamanders are examples of amphibians. Most young amphibians live in water and breathe with gills. As they grow they form lungs and legs and move onto land.

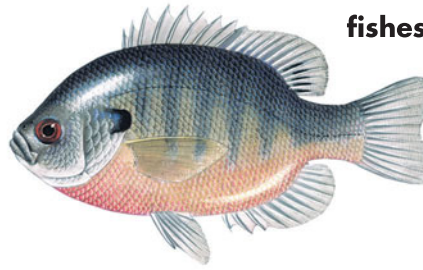
The first vertebrates to live completely on land were reptiles—for example, lizards, snakes, and crocodiles. Reptiles have dry, scaly skin. Some reptiles, such as turtles, spend a lot of time in water, but they breathe air.

Vertebrates that have wings and feathers are called birds. Most, but not all, birds can fly.

Vertebrates that feed their babies with milk from the mother are called mammals. Mammals include mice, deer, seals, whales, monkeys, and humans.

Vertebrates

fishes



amphibians



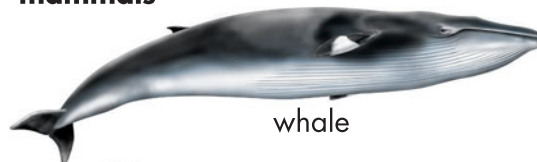
reptiles



birds



mammals



whale



groundhog

human

Mammals live on land in all parts of the world. A few types, such as whales, live in the ocean but still must breathe air.

► **More to explore**

Amphibian • Bird • Fish • Insect
• Living Things • Mammal • Mollusk
• Plant • Reptile • Worm

Animal Disease

► see Disease, Animal.

Animal Migration

► see Migration, Animal.

Animals, Extinct

When an entire species, or type, of animal dies out, that species is extinct. Once a species becomes extinct, it is gone forever.

Causes of Extinction

The most common cause of extinction is a sudden, serious change in a species' habitat. A habitat is the surroundings in which an animal lives. Animals can rarely survive such sudden change. Their food supply may be wiped out. They may also lose shelter or other things that they need to survive.

Many things can change a species' habitat. Floods, fires, droughts, volcanoes, and other natural events may be causes. People also change the environment in ways that drastically affect animals. People clear forests and drain wetlands.

They build dams that disrupt the flow of rivers. They build cities on land that animals need to survive. They also create harmful pollution.

Some changes that cause extinction affect only a small area. Others are large enough to affect the entire world. A fire or other local event may cause the extinction of animals that live only in that region. A sudden change in the global climate might wipe out an animal species that lives in many parts of the world.

People can cause extinctions more directly as well. Some species have been hunted to extinction. The passenger pigeon is one example. Humans killed millions of the birds over many years. The last one died in the early 1900s.

Mass Extinctions

Sometimes many different species become extinct in a short time. This is



A bird called the dodo once lived on an island in the Indian Ocean. Europeans took control of the island in the 1500s and began to hunt the bird. By 1681 the dodo was extinct.



The Tasmanian wolf is an extinct animal. The last members of the species died out in the 1930s.

called a mass extinction. Several major mass extinctions have occurred in the past. Each time many animal species were wiped out. Some survived, however, and over millions of years new species developed.

The worst mass extinction happened about 248 million years ago. This extinction included mainly animals without backbones that lived in water. Another mass extinction occurred about 65 million years ago. It wiped out many of the planet's land animals, including the dinosaurs.

Dinosaur Extinction

Dinosaurs first appeared on Earth about 215 million years ago. They were the most important land animals for more than 150 million years. By 65 million years ago, however, the dinosaurs had died out.

Many scientists believe that a large asteroid, or rock from space, caused this mass extinction. When the asteroid hit Earth, the impact caused drastic changes. Thick dust and other materials blocked the sun. Temperatures dropped, and plants could not grow. The dinosaurs could not

survive the cold temperatures and lack of food. But early species of birds and mammals did survive.

Large Mammal Extinction

About 10,000 years ago another mysterious animal extinction occurred. This extinction was especially dramatic in North America, where many large mammals disappeared. Among them were woolly mammoths and saber-toothed cats.

Scientists do not know what caused this extinction. Some believe that growing numbers of human beings hunted and killed too many of the animals or their prey. Another theory is that the climate changed and affected the availability of food.

Endangered Species Today

In the past 200 years the world has lost many animal species. Hundreds of others are on the verge of extinction. Animals at risk of dying out are called endangered species.

Governments today are working to protect the world's endangered species. Laws protect some animals' habitats from being polluted or destroyed. Other laws make it illegal to hunt endangered animals. Some species respond well to these protective measures and increase in number. Others are not as successful.

► More to explore

Animal • Dinosaur • Endangered Species • Mastodon and Mammoth

Did You Know?

The Carolina parakeet and the passenger pigeon were birds once found in the United States. People killed so many of them that both types became extinct in 1914.

Animals, Legendary

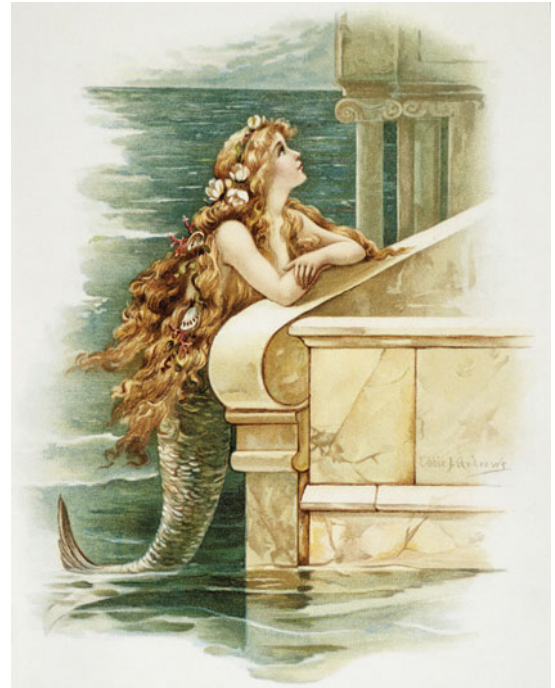
Stories about unusual animals were commonplace in earlier times. Such animals are called legendary because they exist only in these stories, or legends. The stories were often based on travelers' reports of animals that were unfamiliar to them. Some famous legendary animals include the dragon, various sea serpents, the unicorn, and the phoenix. Even today some people speak of having seen animals such as the yeti, Bigfoot, and the Loch Ness monster.

The Dragon

The dragon was usually thought of as a huge scaly lizard or snake that breathed fire and had wings like a bat. In the Middle Eastern world, the serpent or dragon symbolized evil. In Christian art the dragon came to stand for sin. In China, however, the dragon is known as a kind creature.



A sculpture of a dragon decorates a tiled wall in Beijing, China.



Mermaids have appeared in many stories, including "The Little Mermaid" by Hans Christian Andersen.

Sea Creatures

Sea serpents were supposed to be enormous snakes, or huge creatures that inhabited the deep sea. Sailors throughout the ancient world reported having seen such creatures. In Norwegian sea folklore, the kraken was a huge creature, part octopus and part crab. Accounts of these creatures might have been based on sightings of giant squid, which can reach a length of 60 feet (18 meters).

Mermaids were also mythical sea creatures. They were thought to have the head and upper body of a woman and the tail of a fish. Stories of mermaids may have come from people who saw water-dwelling mammals, such as the dugong and manatee. These animals feed their young in human fashion

above water and from afar may have looked like a person.

The Unicorn



A tapestry made in the 1400s shows a unicorn with a large horn.

The unicorn was a mythological animal with a single horn on its forehead. Its body shape resembled a horse or a young goat. The unicorn was referred to in the ancient myths of India and China. It appears in artwork from the ancient civilization of Mesopotamia. During the Middle Ages (about AD 500–1500) artists from Europe, the Islamic world, and China included the unicorn in their artwork as well.

The Phoenix

Mythological creatures also have taken the form of birds. A fabulous bird known as the phoenix was associated with the worship of the sun in ancient

Egypt. It was said to be as large as an eagle, with brilliant scarlet and gold feathers. Legend had it that only one phoenix existed at any one time and that it lived at least 500 years. As its death approached, the phoenix made a nest. It then set the nest on fire and was consumed in the flames. A new phoenix miraculously emerged from the ashes.

Modern Creatures

Some people have claimed to have seen a “monster” in Loch Ness, a lake in northern Scotland. No one has ever proved the monster’s existence, however.

More recent legendary creatures are the Abominable Snowman and Bigfoot. The Abominable Snowman, or yeti, is a monster thought to live in the Himalayan mountain range. Reports of the monster are based mostly on mysterious markings in the snow. Many people think that the markings come from bears. Bigfoot, or Sasquatch, has been described as a large, hairy creature resembling a human. It is believed by some to exist in the northwestern United States and western Canada.

Animation

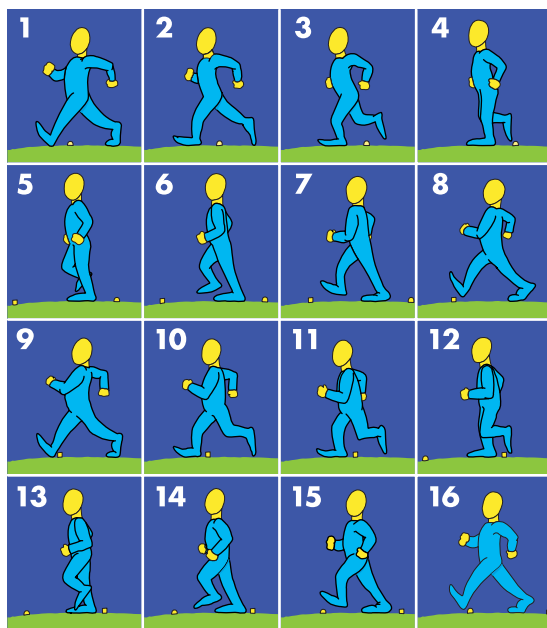
Animation is the art and science of making pictures, or images, appear to move. Animated movies and television shows are popular forms of entertainment. There are two basic types of animation: traditional animation and computer animation.

Did You Know?

The mermaid is not the only legendary creature with a human head and an animal body. The centaur has the body of a horse, and the sphinx has the body of a lion.

Traditional Animation

Movies and television shows made with traditional animation are also called cartoons. Teams of artists create them one picture at a time.



To create an animation an artist draws the same character many times. In each drawing the character has changed position slightly.

Thousands of drawings are needed for only a few minutes of animation. Each drawing is a bit different from the one before it. For example, to show a character walking, the first drawing might show the character with both feet on the ground. The next drawing might show the knee with a tiny bend and the foot slightly off the ground. In the third drawing, the knee might be bent more and the foot might be a little farther off the ground, and so on.

To save work and time, artists paint or draw the moving parts of a scene on sheets of clear plastic film. They place a drawing of the parts of the scene that do

not move under the clear film. In this way they do not need to redraw the background in every picture.

Then filmmakers use a special camera to take a picture of each drawing on its background. Each of these pictures is called a frame. The camera records the frames one after another on long strips of film. To make the images move smoothly, 24 frames are needed for every second of film.

Filmmakers can also create animation with figures made of clay or other materials. Instead of drawing thousands of images, they take many photographs of figures set up in a scene. They move the figures slightly between each photograph. This technique is called stop-motion animation.

Computer Animation

Computers have made animation a faster process. They can produce the



Artists used computers to make the animated movie *Toy Story* in 1995.

thousands of pictures needed for an animated film more quickly than human artists. Artists can also use computers to create characters, objects, and backgrounds that look more real than drawings do. Today computers are used in almost all animation.

Computer animation can be used to make a whole movie or to create special effects in live-action films. Many spacecraft, robots, and monsters in movies are actually computer images.

Computer animation can be used for more than just entertainment. Scientists use computer animation to show things that people cannot easily see in real life. Such things include the movement of the solar system, weather patterns, and the inside of the human body.

History

In the 1800s people invented spinning machines that made a series of drawings appear to move. The first animated films appeared in the early 1900s. Walt Disney made the first animated film with sound, *Steamboat Willie*, in 1928. In 1937 Disney made *Snow White and the Seven Dwarfs*. It was the first full-length animated film to be released as a major motion picture in the United States. Animated television shows appeared in the United States in the 1950s. *Toy Story*, from 1995, was the first long film made completely with computer animation.

► More to explore

Cartoon • Disney, Walt • Movie
• Television

Ankara



Population
(2007 census)
3,763,591

Ankara is the capital of the country of Turkey. The city is located in the part of Turkey that lies in southwestern Asia, called Asia Minor. Ankara is Turkey's second largest city, after Istanbul.

Ankara is one of Turkey's main industrial centers. Its factories produce wine and beer, processed foods, decorative flooring, construction materials, and tractors. Tourism and other service industries have expanded rapidly in the city.

People have lived in the Ankara area for many thousands of years. In 334 BC Alexander the Great conquered Ankara. The city later became part of the Roman Empire and then the Byzantine Empire.



Mustafa Kemal is buried in a mausoleum, or tomb, in Ankara.

Ankara was part of the Ottoman Empire from the 1400s to the early 1900s. In 1919 the Turkish leader Mustafa Kemal set up a rival government in Ankara. He wanted Turkey to become its own country. Turkey became an independent republic in 1923, and Ankara became its capital.

► **More to explore**

Asia Minor • Istanbul • Turkey

Annapolis



Population

(2000 census)
35,838; (2007
estimate)
36,603

Annapolis is the capital of the state of Maryland. The city lies along the Severn River at its mouth on Chesapeake Bay.

Annapolis has a port on the bay, which leads to the Atlantic Ocean.

Many people in Annapolis work for the state government. The United States Naval Academy in Annapolis trains officers for the Navy and Marine Corps. The city's leading industries are crab and oyster fishing, seafood processing, and boatbuilding.

The city was founded in 1649. It was originally called Providence. The city became the capital of Maryland in 1694. The following year the city was renamed Annapolis.

In the 1700s Annapolis was an important center of social and political life in the American Colonies. It served as the capital of the United States from 1783 to 1784. Many historic buildings from the 1700s can still be seen in Annapolis today.



Saint Mary's Church was built between 1858 and 1860. It is located on Spa Creek in Annapolis' historic district.

Ant

Ants are social insects. This means that they live together in organized communities called colonies. There are more than 10,000 different species, or kinds, of ant. Ants are found almost everywhere in the world, but they are most common in hot areas.

Ants range in size from 0.08 inch to 1 inch (2 to 25 millimeters). They are usually yellow, brown, red, or black. The body of an ant is divided into three sections: the head, the thorax (midsection), and the abdomen. The head is large, and the abdomen is slender and oval. The thorax is connected to the abdomen by a small waist. Two antennas are located on the top of the head. Ants use their antennas for guidance, smell, and communication.

Most types of ant live in nests that they make from many different materials,



Harvester ants work to store grass, seeds, and berries in their nest.



Carpenter ants like wood of all kinds. They make their nests in live or dead trees or in wooden structures such as telephone poles and porches.

including soil, sand, wood, and leaves. Some ants build anthills. Within each nest there is usually a queen, workers, and soldiers. The queen spends her life laying eggs. The workers are females who do the work of the nest—for example, collecting food, cleaning the nest, and caring for eggs. Soldiers are larger females who defend the colony. They also raid other colonies and often capture slaves.

At certain times of the year, many species produce winged males and queens. The males' only purpose is to mate with the queens. The males and the queens fly into the air to mate. The males die soon afterward. Each queen then lays her eggs and sets up a new nest. It takes several weeks for the eggs to develop into adults. Most ants live for 6 to 10 weeks, though some live up to 15 years.

► **More to explore**

Insect

Antananarivo



Population
(2001 estimate)
1,403,449

Antananarivo is the capital of Madagascar, an island country off the southeastern coast of Africa. Antananarivo stands on a high hill in the country's central highlands. It is the largest city in Madagascar by far.

Antananarivo's historic sites include royal palaces from the 1800s. The city also has Anglican and Roman Catholic cathedrals and the National Library. The University of Madagascar was opened in the city in 1961.

Antananarivo has been a government center for hundreds of years. Many of the city's residents work for the government of Madagascar. Banking and business services are also important to the economy. The city's factories process tobacco and make foods, leather, and clothing.

Antananarivo began as a fortress town in the 1600s. It became the capital of the Merina kingdom in the 1700s. In 1895 French troops took control of the town. Within 10 years the French controlled most of the island. They made the town the capital of their colony. In 1960 the colony became an independent country with its capital at Antananarivo. The city grew quickly in the late 20th century.

► **More to explore**
Madagascar



The sun sets on the hilly city of Antananarivo.

Antarctica

The southernmost continent in the world, Antarctica surrounds the South Pole. Its name means “opposite to the Arctic” (the Arctic is the region around the North Pole). Antarctica is larger than both Europe and Australia. But it has no permanent human population.

Land

An ice sheet covers nearly all of Antarctica. It contains 90 percent of the world’s ice and 70 percent of the world’s freshwater. At its thickest point the ice sheet is 15,670 feet (4,776 meters) deep. Around the coast, glaciers continually break off icebergs into the sea.

The continent has two unequal parts. The larger is generally known as East

Antarctica, while the smaller is West Antarctica. West Antarctica includes the Antarctic Peninsula, an 800-mile (1,300-kilometer) extension of the continent that juts northward toward the southern tip of South America. The Transantarctic Mountains separate East and West Antarctica. Mountains with only their peaks showing through the ice, known as nunataks, are found in some areas. Antarctica has several active volcanoes.

About 2 percent of Antarctica is ice-free. These unusual land areas, called oases, are mostly found near the coast. They include the dry valleys of southern Victoria Land and the Bunger Oasis in Wilkes Land.



Penguins are among the few animals that can survive the very cold temperatures of Antarctica.



Antarctica does not have 24-hour periods divided into days and nights. At the South Pole the sun rises on about September 21 and moves in a circular path until it sets on about March 22. This “day,” or summer, is six months long. From March 22 until September 21 the South Pole is dark, and Antarctica has its “night,” or winter.

Antarctica is the coldest continent. The average annual temperature in the interior is -70°F (-57°C). But the coast is warmer. Along the Antarctic Peninsula temperatures can rise up to 59°F (15°C).

Plants and Animals

The extreme cold has kept the continent almost empty of life. Some mosses and liverworts grow in ice-free areas along the coast, and two types of flowering plants grow on the peninsula. Native land animals are limited to certain kinds of arthropods, or insectlike animals.

About 45 kinds of birds live in Antarctica. The emperor and the Adélie penguins are found in large numbers around the entire coastline. Gentoo and chinstrap penguins occupy the Antarctic Peninsula coasts and some islands. Several kinds of seals and whales inhabit the waters around Antarctica. Fishes limited to the Antarctic include the Antarctic cod and the icefish.

History

The first recorded landing on Antarctica was on Cape Adare in 1895. The first people to spend a winter on the conti-

Facts About ANTARCTICA	
Area	5,400,000 sq mi (14,200,000 sq km)
Population	No permanent population
Coldest Recorded Temperature	July 21, 1983, Vostock Station: -129°F (-89°C)
Hottest Recorded Temperature	January 5, 1974, Lake Vanda: 59°F (15°C)

ment did so in a ship that was caught in ice at Cape Adare during the period from March 1898 to March 1899. Englishmen Robert F. Scott and Ernest Henry Shackleton led three expeditions to the Antarctic between 1901 and 1913. They pioneered routes into the interior of the continent, and the research they conducted provided a base for present-day scientific programs. On December 14, 1911, Roald Amundsen of Norway became the first person to reach the South Pole. Many other expeditions followed.

Every year hundreds of researchers travel to Antarctica to conduct experiments. Widespread scientific investigation of Antarctica began during the International Geophysical Year in 1957–58. In 1959, 12 countries signed the Antarctic Treaty to reserve the continent for peaceful, scientific purposes. By 2000, 44 countries had signed the treaty.

► More to explore

Amundsen, Roald • Continent • Glacier • Iceberg • Penguin • Polar Exploration

Anteater

Anteaters are curious-looking animals. Their long heads and snouts look like tubes, and they have no teeth at all. Anteaters use their strong front legs and heavy claws to break open nests of ants and termites. When the insects rush out, the anteaters eat them with their long, sticky tongues.

Anteaters live in the swamps and forests of Central and South America. They are related to sloths and armadillos, which also live in Latin America.

True Anteaters

There are four species, or types, of anteater. They make up a scientific group called *Vermilingua*, which means “worm-tongue.”

The largest species is the giant anteater. From the tip of its snout to the end of its tail, the giant anteater is about 6 feet (1.8 meters) long. Its coat is mostly gray, and its long tail is bushy. It feeds on the ground by day and by night.

There are two different species of lesser anteater, or tamandua, but they look very similar. Lesser anteaters are only about half the length of giant anteaters. They also have shorter muzzles. Lesser

anteaters have tan, black, or tan-and-black coats. They live in trees and feed at night. They use their long, nearly hairless tails to climb on tree branches.

The silky, or two-toed, anteater is the smallest of the group. It is the size of a squirrel. It has a silky, yellowish coat and a long, furry tail. Like lesser anteaters, the silky anteater lives in trees and feeds at night.

Other Animals Called Anteaters

People sometimes call other insect-eating animals anteaters, but these animals are not related to true anteaters. They include the numbat (or banded anteater), the armadillo (or ant bear), the echidna (or spiny anteater), and the pangolin (or scaly anteater).

► More to explore

Armadillo • Sloth

Antelope

Antelopes are a group of plant-eating mammals that belong to the same family as sheep, goats, and cattle. The impala, the addax, gazelles, gnus, and kudus are all antelopes. The pronghorn, or prongbuck, is also known as an antelope, but it belongs to a different family.

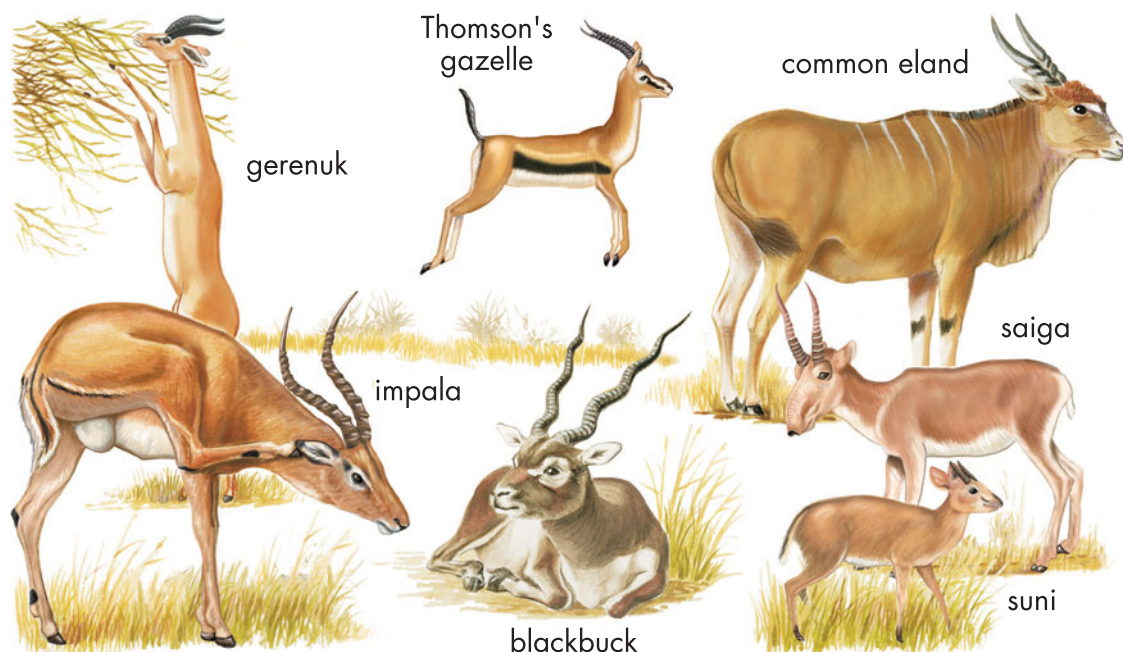
Antelopes live on the large, grassy plains of Africa and in the central and southwestern regions of Eurasia (the continents of Europe and Asia). Only the pronghorn is found in North America.

Did You Know?

The giant anteater's tongue can be as long as 24 inches (60 centimeters).



giant anteater



There are many different kinds of antelope. They include the blackbuck, which is found in India; the saiga from elsewhere in Asia; and the gerenuk, Thomson's gazelle, common eland, impala, and suni from Africa. In most of these animals only the males have horns.

Antelopes are generally about the same size as most goats and deer. They have hooves on their feet. Their coats are generally golden, reddish tan, or gray. The face, belly, and rump tend to be white. Most male antelopes have horns that curve backward.

Antelopes have excellent senses of smell and hearing. These help them to detect danger and leap to safety. The impala can make leaps as long as 30 feet (9 meters). Antelopes can also run very fast. One type of gazelle can run 50 miles (80 kilometers) per hour.

Antelopes generally travel in herds of several hundred animals. During the mating season, male antelopes mark their territory by rubbing their scent glands against plants and trees. A male will fight other male antelopes to defend his territory. The male then attracts a

female, or doe, and they mate. The doe gives birth to one young about four to eight months later, depending on the type of antelope.

► More to explore

Hoof • Horn • Mammal

Anthem, National

► see National Anthem.

Anthony, Susan B.

In the 1900s women in the United States fought to gain equal rights with men. One of the leaders of that movement was Susan B. Anthony.



Susan B. Anthony

Susan Brownell Anthony was born on February 15, 1820, in Adams, Massachusetts. When she was 6 years old her family moved to Battenville, New York. As a young woman she taught school.

In the 1850s Anthony became involved in both the temperance movement, which fought alcohol abuse, and the abolitionist movement, which sought to end slavery. She traveled widely, spoke at public meetings, and began to take an interest in women's issues.

At the time, women in the United States did not have the right to vote. To fight this injustice, Anthony and her friend Elizabeth Cady Stanton formed the National Woman Suffrage Association (NWSA) in 1869. "Suffrage" means the right to vote.

To draw attention to the struggle, Anthony tried to vote in the 1872 presidential election. She was arrested, but she refused to pay her fine. In 1890 the

NWSA merged with another group to form the National American Woman Suffrage Association. Anthony was president from 1892 to 1900.

Susan B. Anthony died on March 13, 1906, in Rochester, New York. In 1920 the 19th Amendment to the U.S. Constitution gave voting rights to women in all states.

► More to explore

Abolitionist Movement • Stanton, Elizabeth Cady • Women's Rights

Anthropology



Some anthropologists study how certain groups of people live. They may travel to remote places, such as the Ituri Forest in central Africa, to observe these groups.

Anthropology is the study of human beings and their cultures, from prehistoric times to today. The people who practice anthropology are called

anthropologists. Anthropologists often compare different human communities. They try to determine their similarities and differences. By doing this, anthropologists hope to increase their knowledge about humanity as a whole, as well as about specific groups of people.

Anthropology has two main divisions: physical and cultural. Physical anthropologists study the physical features of humans. Cultural anthropologists examine human cultures. Both these kinds of anthropology may include the study of prehistoric, ancient, and modern humans.

Physical Anthropology

Physical anthropology is related to the science called biology. Physical anthropologists examine differences in human physical features. They often study human genes. These are the things that pass along traits from parents to their children. They may also measure the shape, size, and structure of body parts or properties such as blood types.



Some anthropologists study the bones and other remains of humans.

Some physical anthropologists compare the physical features among people from different geographic areas. Others may examine what makes humans physically different from other animals, such as apes. Some physical anthropologists study the remains of prehistoric humans to learn about human origins. They try to determine how and when modern humans developed from early forms of humans and from nonhuman ancestors. In other words, they study human evolution.

In the past, some physical anthropologists divided people into races. They ranked the races based on such features as skull size and skin color. They thought that some races were better than others. However, that idea came from prejudices, not from true science. In the late 20th century anthropologists found that modern humans are all very similar in their genes. In fact, there is no scientific basis for dividing people into races.

Cultural Anthropology

Cultural anthropology is a social science, or a field of study concerned with human societies. Cultural anthropologists study many aspects of human cultures, in different places and times. These may include art, language, religion, clothing, customs, and social structure. Anthropologists try not to judge a culture's practices as good or bad. Instead, they try to find out what the practices mean to the people of that culture. They also compare the practices of various societies.

Did You Know?

Margaret Mead of the United States was a famous anthropologist. She studied the peoples of Oceania during the mid-1900s.

Archaeology is one type of cultural anthropology. Archaeologists uncover and study pottery, tools, and other objects left by prehistoric and ancient peoples. They try to learn how such peoples lived.

In the 1800s and early 1900s most cultural anthropologists were from western Europe or the United States. They usually traveled to another part of the world, such as Africa or Asia, to study different cultures. Today cultural anthropologists from all around the world study a wide variety of human groups. For instance, they may study small fishing villages, gangs in big cities, religious groups, or large companies.

► More to explore

Archaeology • Biology • Culture
• Evolution • Genetics • Human Origins
• Social Science

Antibiotic

Doctors sometimes treat patients with a type of medicine called an antibiotic. Antibiotics treat illnesses and infections caused by bacteria, or tiny organisms. Antibiotics can come in the form of a pill, a liquid, a cream, or a shot. One of the first widely used antibiotics was penicillin. It was discovered in 1928.

Doctors use antibiotics to cure serious diseases such as pneumonia, tuberculosis, and meningitis. Antibiotics can also fight common problems such as acne and strep throat. Antibiotics do not work against common colds or other illnesses caused by a virus.

Did You Know?

Antibiotics should always be used carefully. Some people have bad reactions to certain antibiotics.



A special test shows whether or not antibiotics can stop the growth of certain bacteria. Tablets that contain antibiotics are placed on a surface with bacteria on it. The clear areas around the tablets show that the antibiotics have stopped the bacteria from growing.

Antibiotics work by killing bacteria or by preventing them from multiplying. Sometimes, however, not all the bacteria die. The bacteria that survive are said to have a resistance to the antibiotic. As those bacteria multiply, they pass on the resistance to new bacteria. The next time those bacteria are exposed to the same antibiotic, even fewer of them die. Eventually the antibiotic does not kill enough of the bacteria to make the illness go away.

When enough types of bacteria become resistant to an antibiotic, doctors no longer use that antibiotic as medicine. The number of resistant bacteria continues to grow. Scientists are working to find new antibiotics to replace the old ones.

► More to explore

Bacteria • Disease, Human • Penicillin
• Virus

Antigua and Barbuda



The Caribbean island country of Antigua and Barbuda is known for its powdery beaches. The capital is Saint John's.

Geography

The country consists of three islands: Antigua, Barbuda, and Redonda. Antigua has rolling hills and volcanic rocks. Near the coast are coral reefs. Barbuda is a flat island 25 miles (40 kilometers) north of Antigua. No one lives on Redonda, a large rock southwest of Antigua.

The country has a warm, tropical climate. Droughts often occur on Antigua.

Plants and Animals

Barbuda has rain forests and lush vegetation. With its drier climate, Antigua has no forests but many kinds of cactus. Barbuda is home to many large seabirds called frigate birds.

People

Most of the country's people are descendants of African slaves. Small populations of whites, Asians, and American Indians also live there. Most people are Christian. The official language is English.

Economy

Tourism is very important to Antigua and Barbuda's economy. Transportation, communications, financial services, real estate, and construction are also important. There is little manufacturing,

mainly of beer and T-shirts. Agriculture and fishing play a small role in the economy. The main crops are tropical fruits.

History

The first inhabitants of Antigua and Barbuda were the Ciboney people and, later, the Arawak people. The explorer Christopher Columbus landed on Antigua in 1493.

The English took over the islands in 1632. They brought in Africans to work as slaves on large sugar plantations. The slaves won freedom in 1834.

The islands were part of the British Leeward Islands colony until 1956. Great Britain then managed their foreign affairs until 1981, when Antigua and Barbuda gained independence.

► More to explore

Arawak • Caribbean Sea • Columbus, Christopher • Coral



Facts About ANTIGUA AND BARBUDA



Population
(2008 estimate)
87,500

Area
171 sq mi (442 sq km)

Capital
Saint John's

Form of government
Constitutional monarchy

Major city
Saint John's

Apache

The people known as the Apache include several related Native American groups. The Apache are familiar to many people because of the Wild West stories about Cochise and Geronimo. Both men were famous Apache warriors who fought to keep Apache lands free from Mexico and the United States.

Historians believe that the ancestors of the Apache lived in Canada. The Apache probably migrated to the American Southwest in about AD 1000. The traditional Apache homelands are located in what are now Arizona, Colorado, New Mexico, Texas, and the Mexican states of Chihuahua and Sonora.

The Apache were nomads who moved from camp to camp depending on the season and the food supply. They got their food by hunting, gathering wild plants, and farming. They also carried out raids on other people to obtain



An Apache woman holds a child in a cradleboard. Many Native American women used cradleboards to carry small children on their back.

horses and supplies. The Apache made dome-shaped shelters, known as wicki-ups, by covering a wooden frame with grass or branches.

Spanish explorers were the first non-Indians to enter Apache lands. Mexicans and Americans came later. American settlement in Apache territory led to fierce fighting between the Apache and the U.S. military in the second half of the 1800s. The last of the Apache wars ended with Geronimo's surrender in 1886. Some of the Apache settled in Oklahoma; others moved to a reservation in New Mexico. At the end of the 20th century there were about 57,000 Apache. Many lived on reservations in the Southwest.

► More to explore

Geronimo • Native Americans

Apartheid

Apartheid was a system for keeping white people and nonwhites separated in South Africa. It lasted from about 1950 to the early 1990s. The word apartheid means “apartness” in Afrikaans, a language spoken in South Africa.

The population of the country is mostly nonwhite. But for many years the white people of South Africa controlled the country's government. They established laws that kept the races separate and discriminated against the nonwhite majority.

Apartheid divided South Africans into four groups: white, Bantu (black), Col-



During the period of apartheid blacks and whites were kept apart in many ways. A sign from that time says that a beach is for whites only.

ored (of mixed descent), and Asian. The policy created separate areas in cities for each group. Members of a group were not allowed to live, operate businesses, or own land outside of their area. Under “pass” laws, nonwhites had to carry passes while in white areas. Other laws set up separate schools and restricted each race to different types of jobs. The government also created 10 territories called “homelands” and forced all blacks to move to them.

With the support of some whites, many blacks in South Africa protested against apartheid. The African National Congress (ANC) led the fight. The protests sometimes turned violent. A district called Soweto rioted in 1976 against a requirement that blacks learn Afrikaans. Other countries also condemned apart-

heid. In 1985 Great Britain and the United States restricted trade with South Africa.

In response to the protests, the South African government granted nonwhites some rights in the late 1980s. In 1990–91 the government led by President F.W. de Klerk ended most of the apartheid laws. In 1994 all races were allowed to vote in a national election. Nelson Mandela, leader of the ANC, was elected president. Apartheid was over, but its effects remained. Racial discrimination continued in South Africa.

► More to explore

African National Congress

- Discrimination • Mandela, Nelson
- South Africa

Apatosaurus

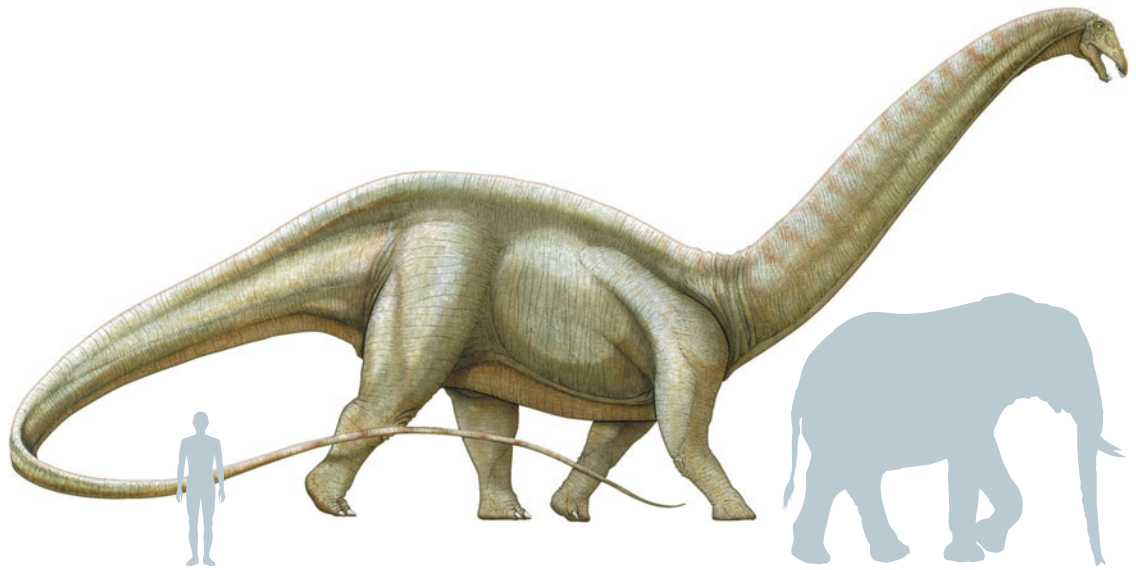
A massive dinosaur, the *Apatosaurus* weighed as much as five elephants. The name *Apatosaurus* means “deceptive lizard.” It used to be called *Brontosaurus*, which means “thunder lizard.” *Apatosaurus* belongs to the group of dinosaurs known as sauropods, which also includes *Brachiosaurus*. The sauropods were large, plant-eating dinosaurs with a long neck, a massive body, and four pillarlike legs.

When and Where *Apatosaurus* Lived

Apatosaurus lived about 147 to 137 million years ago. Most *Apatosaurus* remains have been found in North America,

Did You Know?

Scientists once thought that *Apatosaurus* needed to live in water to support the weight of its heavy body. Modern scientists now agree that the dinosaur was mainly a land animal.



Apatosaurus

particularly in Wyoming, Utah, Oklahoma, and Colorado.

Physical Features

Apatosaurus was one of the largest land animals of all time. It reached a length of 70 feet (21 meters), weighed 30 to 36 tons, and stood 15 feet (4.6 meters) tall at the hips. This dinosaur also had a very long neck and tail. *Apatosaurus* stood and walked on all four legs. It had claws on its large feet. Its head was small and horselike, with long, peg-shaped teeth.

Behavior

Apatosaurus fed on the leaves and needles of trees and plants. Its long neck may have let it reach trees as high as 35 feet (10.6 meters). It swallowed small stones to help grind up the plants in its stomach. *Apatosaurus* probably lived and traveled in herds. Like other dinosaurs, it reproduced by laying eggs.

► More to explore

Brachiosaurus • Dinosaur

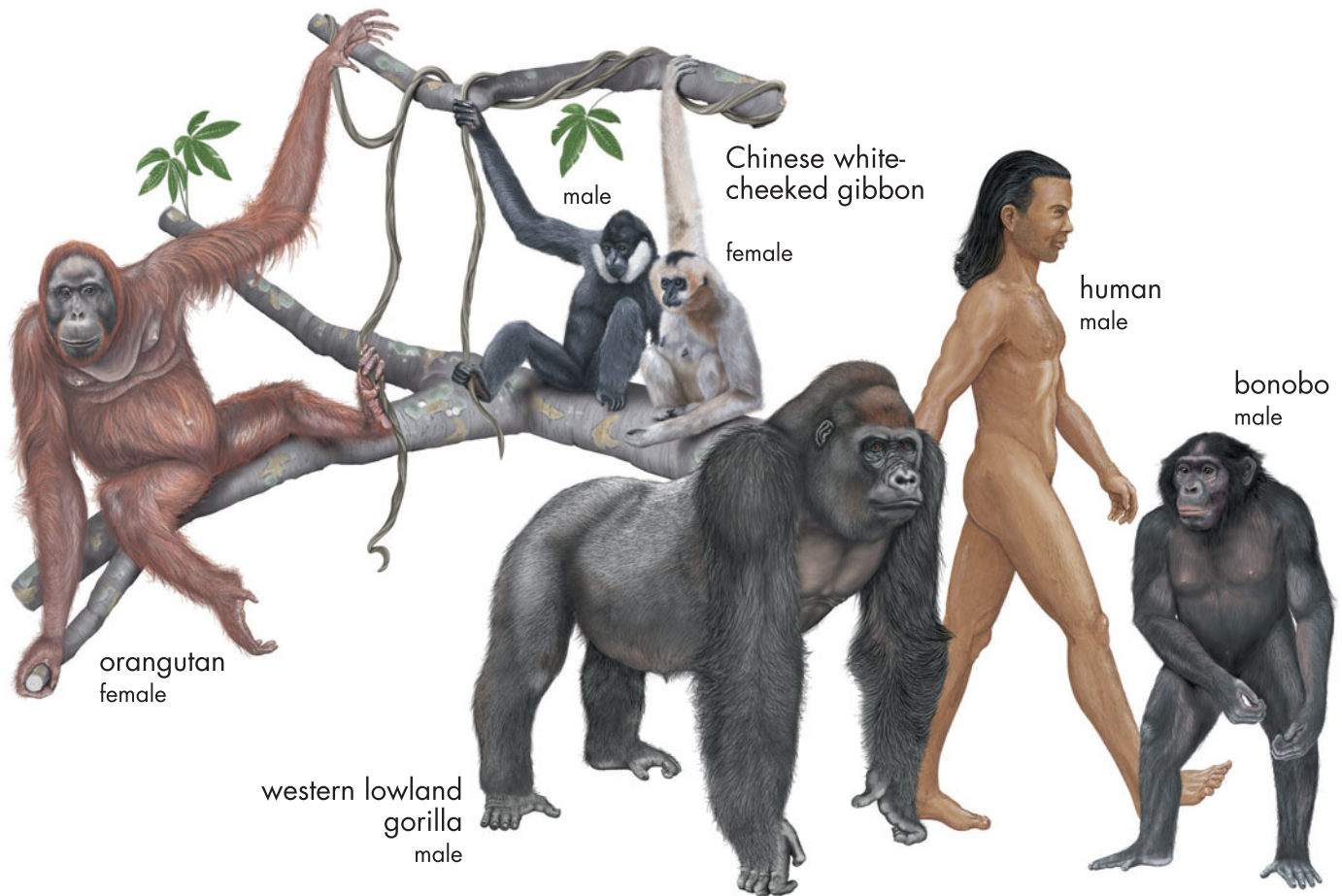
Ape

Apes are the animals that are most closely related to humans. Both apes and humans are members of the scientific group of animals called primates. Monkeys are primates, too. However, apes differ from monkeys in several ways. For instance, apes have more complex brains than monkeys do. Also, monkeys have tails but apes do not.

The apes are divided into two categories: great apes and lesser apes. Gorillas, orangutans, chimpanzees, and bonobos are great apes. They are larger and more intelligent than the lesser apes. The gibbons are lesser apes.

Where Apes Live

Apes live in warm or hot rain forests. Gibbons and orangutans are found in southeastern Asia. Gorillas and chimpanzees are found in western and central Africa. Bonobos have the smallest range. They are found only in part of the



Apes include orangutans, gorillas, bonobos, and gibbons. They vary in size, but some of them can be as big as an adult human.

Democratic Republic of the Congo, a country in central Africa.

Gibbons and orangutans live mainly in trees. On the other hand, gorillas spend most of their time on the ground.

Chimpanzees and bonobos tend to eat and sleep in trees, but they travel mostly on the ground.

Physical Features

The smallest apes are the gibbons. Most gibbons are about 16 to 26 inches (40 to 65 centimeters) long. Gorillas are the largest apes. They may grow to about 66 inches (170 centimeters) in length and

weigh 300 to 600 pounds (135 to 275 kilograms).

All apes have a coat of hair, which is usually tan, brown, black, gray, or reddish. They have long arms and shorter legs. Gorillas, orangutans, and chimpanzees generally have powerful arms and broad chests. Bonobos and gibbons are more slender. Like humans, all apes have thumbs that can bend to meet the other fingers.

Behavior

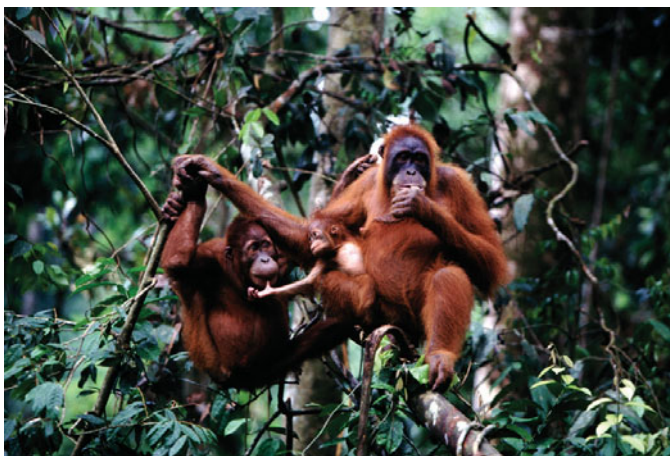
Most apes are active during the day. They usually sleep in trees at night. All

apes except gibbons build nests for sleeping.

Most apes live in groups. Chimpanzees and bonobos are the most social, sometimes living in groups of more than 100 animals. However, male adult orangutans live mostly alone.

Apes eat mainly plants, including fruits, leaves, stalks, and seeds. Sometimes they eat insects or other small animals. Chimpanzees also hunt and kill monkeys and other mammals for food.

Great apes are very intelligent. Some chimpanzees and orangutans in the wild use sticks or other objects as tools. For instance, some chimpanzees poke sticks into ant or termite nests. The chimps pull the sticks out and eat the insects clinging to them. Scientists study the learning abilities of apes in laboratories and zoos. They have taught some great apes to communicate using sign language or pictures of symbols. However, not all scientists agree that these apes have truly learned to use language.



Some apes spend part of their time in trees and part on the ground. Orangutans, like gibbons, spend most of their time in trees.

Reproduction

Reproduction in apes is similar to reproduction in humans. A female ape usually gives birth after a pregnancy of seven to nine months. Normally a single baby is born. Twins are rare. Baby apes are nearly helpless for the first few months after birth. Adult apes may provide care for the young for several years.

Under Threat

Most types of ape are endangered, or at risk of dying out completely in the wild. Humans have cut down the trees in forests where some apes live, destroying their habitats. People also kill apes for their meat. However, people have also begun trying to save these animals. Some countries have national parks to protect apes and their habitats. Laws also make it illegal to hunt or capture endangered apes.

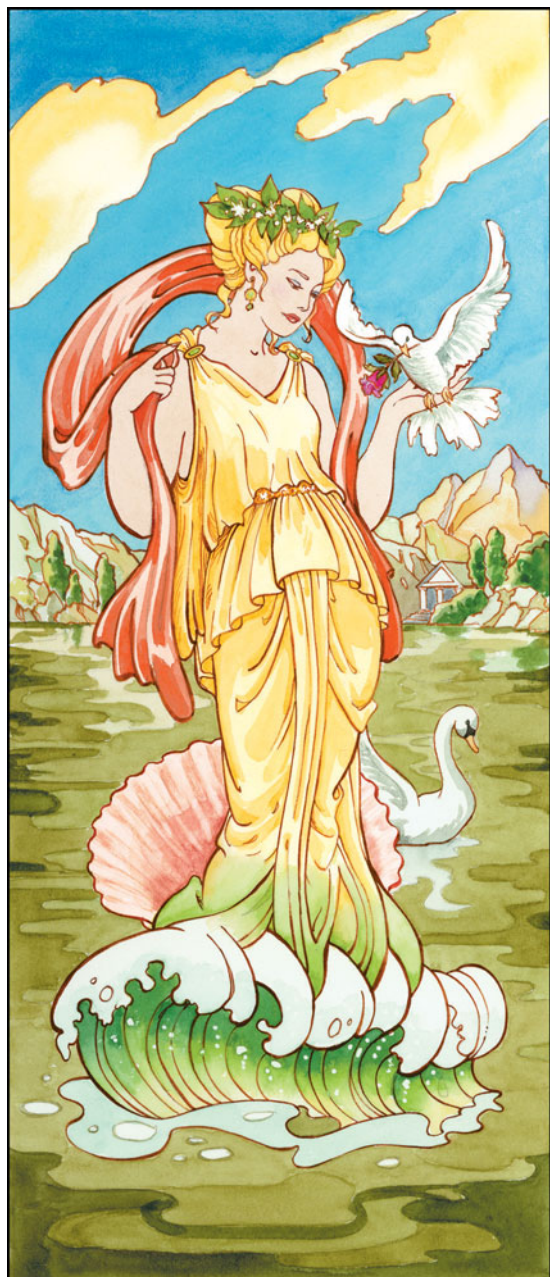
► More to explore

Chimpanzee • Gibbon • Gorilla
• Orangutan • Primate

Aphrodite

In ancient Greek mythology Aphrodite was the goddess of love and beauty. She was one of the 12 chief gods believed to live on Mount Olympus. Aphrodite is associated with the Roman goddess Venus because they shared many of the same characteristics. The symbols of Aphrodite are the dove, rose, myrtle tree, and swan.

In one story Aphrodite was the daughter of Zeus, the ruler of all the gods. Her mother was a Titan named Dione.



Titans were giants who once ruled the world. Other stories tell that Aphrodite sprang fully grown from the foam of the sea. The wind carried her on a shell to the island of Cyprus, which became her home. Sailors prayed to her to calm the wind and waves.

According to legend, gods and humans alike desired Aphrodite because of her

beauty. But she was proud and rejected her admirers. To punish her, Zeus had her marry the ugly god of fire, named Hephaestus. Aphrodite soon left him for Ares, the handsome god of war. One of their children was Eros, the winged god of love. Zeus later arranged for Aphrodite to fall in love with a handsome shepherd named Anchises. From that union Aeneas was born. He was said to be an ancestor of the Roman people.

► More to explore

Ares • Greece, Ancient • Hephaestus
• Mythology • Zeus

Apia

Apia is the capital of Samoa, an island country in the southern Pacific Ocean. It lies on the northern coast of Upolu Island. Apia is Samoa's main port. It ships dried coconut meat, bananas, cocoa, and coffee to other countries. Manufacturing and tourism also bring money to the city.

Apia developed into a port after European missionaries and traders arrived in the mid-1800s. In the 1940s, during World War II, U.S. Marines used Apia as a base.

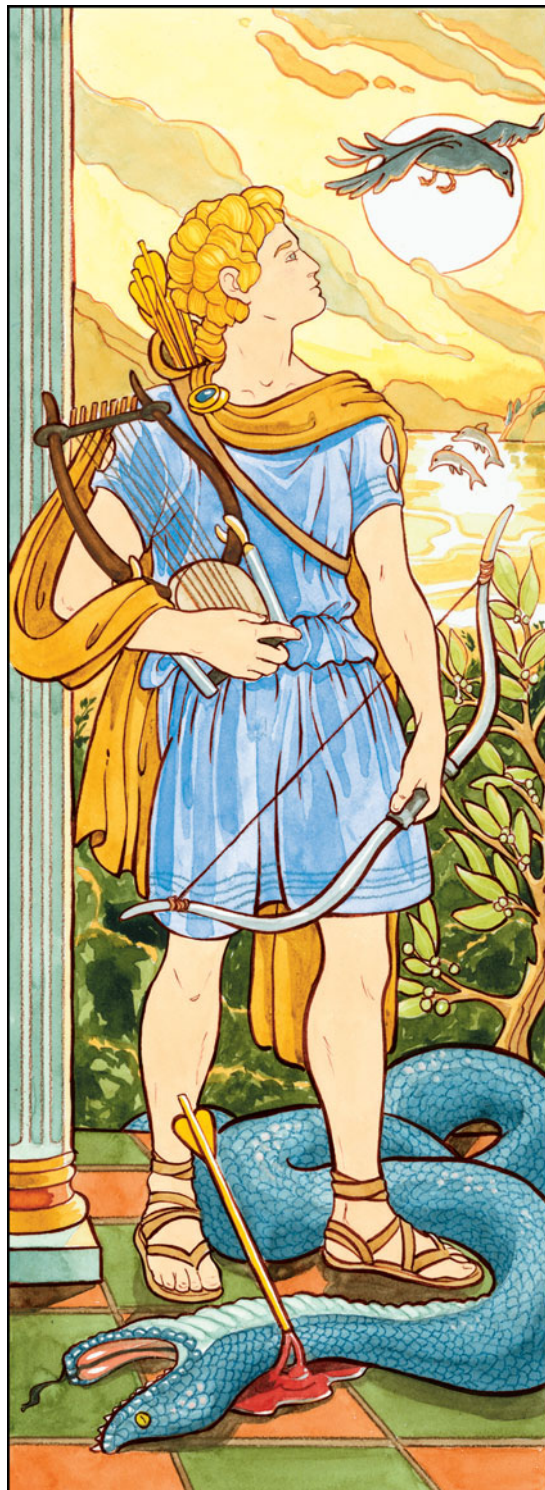
The former home of Scottish writer Robert Louis Stevenson sits on a hill overlooking Apia. Today Samoa's head of state lives there.

► More to explore

Samoa

Apollo

In ancient Greek mythology Apollo was the god of music, healing, light, and prophecy (predicting the future). He was one of the 12 main gods believed to



live on Mount Olympus. He also came to be considered a sun god. Because of Apollo's many important roles, the Greeks loved him greatly. The Romans later worshipped him too. The laurel tree, dolphin, and crow were sacred to Apollo.

Apollo was the son of Zeus, the chief god, and Leto. Leto was a Titan, or one of the giants that once ruled the world. Apollo was also the twin brother of Artemis, the goddess of hunting.

According to tradition, one of Apollo's earliest deeds was to slay a giant snake, called Python. No human dared approach the monster. Apollo came down from Mount Olympus and, after a hard fight, killed Python using his silver bow and golden arrows.

The famous Temple of Apollo stood at a site called Delphi. This was near the place where Apollo had killed Python. People traveled great distances to visit the shrine. There they would speak to one of Apollo's priestesses. She would give them an oracle, or prediction of the future, said to come from Apollo.

According to legend, the god Hermes gave Apollo a lyre (a kind of stringed instrument). Apollo loved the gift and became skilled at playing it. With his music, Apollo charmed the other gods at feasts on Mount Olympus.

► More to explore

Artemis • Greece, Ancient • Hermes
• Mythology • Zeus

Appalachian Mountains



The Appalachian Mountains of eastern North America are lower but much older than the Rocky Mountains in the West. For early settlers who wanted to move from the territory of the original 13 American Colonies to the west, the Appalachians were a natural barrier.

The Appalachians extend almost 2,000 miles (3,200 kilometers), from the Canadian province of Newfoundland and Labrador in the north to the U.S. state of Alabama in the south. The mountains are more than 250 million years old and have been worn down over the years.

Because they extend so far north and south, the Appalachians have a wide range of temperatures. In Canada and in the White Mountains of New Hampshire, Arctic conditions often prevail, especially at high elevations. The south

has milder weather, but heavy clouds and haze are common.

Before settlers arrived from Europe, the Appalachian area from Maine to Georgia was completely covered by forests. The forested area is now smaller but still impressive. Hawks, wild turkeys, and many kinds of songbirds make the Appalachians their home. The region also has black bears, white-tailed deer, wild boars, raccoons, and beavers.

Before the arrival of Europeans, the northern part of the Appalachians was occupied by Native Americans of various Eastern Woodland groups. In the southern mountains, the Cherokee were the main inhabitants. By the middle of the 1800s, most of the Native Americans had been removed from the area. In the south, they were replaced by settlers who lived in isolated communities. Separated from the outside world by the hills,



Screw Auger Falls are in a section of the northern Appalachian Mountains in Maine.

Did You Know?

The highest peak in the Appalachian Mountains is Mount Mitchell in North Carolina. It reaches a height of 6,684 feet (2,037 meters).

these people made their own distinctive culture and music.

Eastern Appalachia has rich farmland. Cotton is grown in the south, while tobacco and fruit are the main crops farther north. The Appalachian area is also known for its minerals. Coal is the most important mineral. It is mined in large quantities in the Appalachian Plateau, from Pennsylvania to Alabama.

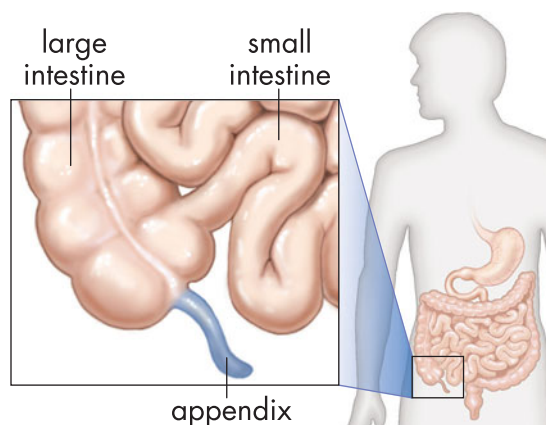
Tourism is also a major industry. The Appalachians offer splendid scenery and many opportunities for outdoor activities. The Appalachian National Scenic Trail is a hiking path that winds through 14 states on its way from Mount Katahdin, in Maine, to Springer Mountain in Georgia.

► More to explore

Mountain • Rocky Mountains

Appendix

The appendix is a part of the human digestive system. It is a finger-sized tube attached to the large intestine. The appendix does not seem to help with digestion. However, if it becomes



blocked or infected, it can cause an illness called appendicitis.

Human beings are one of the few animals that have an appendix. The human appendix is usually 3 to 4 inches (8 to 10 centimeters) long. It is less than half an inch (1.3 centimeters) wide. It extends outward from the first section of the large intestine, in the right side of the lower belly.

Appendicitis usually occurs in people younger than 35 years of age. The illness happens when something (such as digestive waste) blocks the opening of the appendix. The appendix then swells and becomes infected. If swelling continues, the appendix may burst.

An attack of appendicitis usually starts with a dull pain in the belly. Within hours the pain may worsen. The pain may move downward, to the right side of the lower belly. Nausea and vomiting are also common.

Doctors treat appendicitis by removing the appendix. The surgery to remove an appendix is called an appendectomy.

► More to explore

Digestive System • Intestines

Apple

Apples are one of the world's most widely grown fruits. People have eaten them since ancient times. There are thousands of varieties of apple. They grow on trees that belong to the same scientific family as roses.



Apples vary in size, color, and texture.

Where Apples Grow

People grow apples in North America, Europe, and Asia. The leading producers of apples include China, the United States, Poland, Iran, Turkey, and France. Apple trees grow best in areas where the summers are mild and the winters are somewhat cold.

Physical Features and Growth

Apple trees are small to medium in size. In the spring they grow white flowers. The fleshy fruits are usually ready to be picked in autumn. Apples are red, yellow, or greenish and fairly round. They are about 2 to 4 inches (5 to 10 centimeters) wide.

A new apple tree can grow from an apple seed. However, it will not grow the same variety of apple as the tree that made the seed. Because of this, people normally grow apple trees using another method. They cut a twig or bud from the apple tree to be reproduced. They attach this twig or bud to a rootstock, or a young apple tree grown for its strong roots. The parts from the two trees soon grow together into one tree. This new tree will

produce the same variety of apple as the one from which the twig or bud came.

Uses

Apples contain fruit sugars, fiber, and the vitamins A and C. Some varieties are good for eating raw. Other types are best cooked. In the United States apple pie is a traditional dessert. In Europe people often serve fried apples with sausage or pork. Farmers grow some varieties of apple for their juice. People drink the juice fresh or make it into a drink called cider.

► More to explore

Fruit • Tree

Apricot

Apricots are orange or reddish fruits with smooth skin. The trees on which they grow belong to the rose family. Apricots are related to plums and peaches.

Apricots originally grew only in China. They were carried to other parts of the



Apricots are golden ripe and ready to pick in June and July, earlier than most other fruits.

world, and today they grow in all of central and southeastern Asia. They are also found in parts of southern Europe, North Africa, and North America. Turkey is the world's largest producer of apricots. California produces almost all the apricots in the United States.

Apricots are round or oval in shape. They are usually less than 3 inches (8 centimeters) wide. Most apricots have orange or yellow flesh. Some kinds have nearly white flesh. Apricots have a large, flat, smooth seed in the center. The seed is also called a pit, or stone.

Apricots grow on large, spreading trees with bright green, oval leaves. Apricot trees produce small white or pink flowers in spring. The fruits grow from these flowers. The fruit develops slowly at first. After the pit forms, the fruit grows more quickly. Apricots are ready to pick in early summer.

Fresh apricots taste sweet and mild. Most apricots are dried, canned, or made into jam. They are a good source of vitamin A and iron.

► More to explore

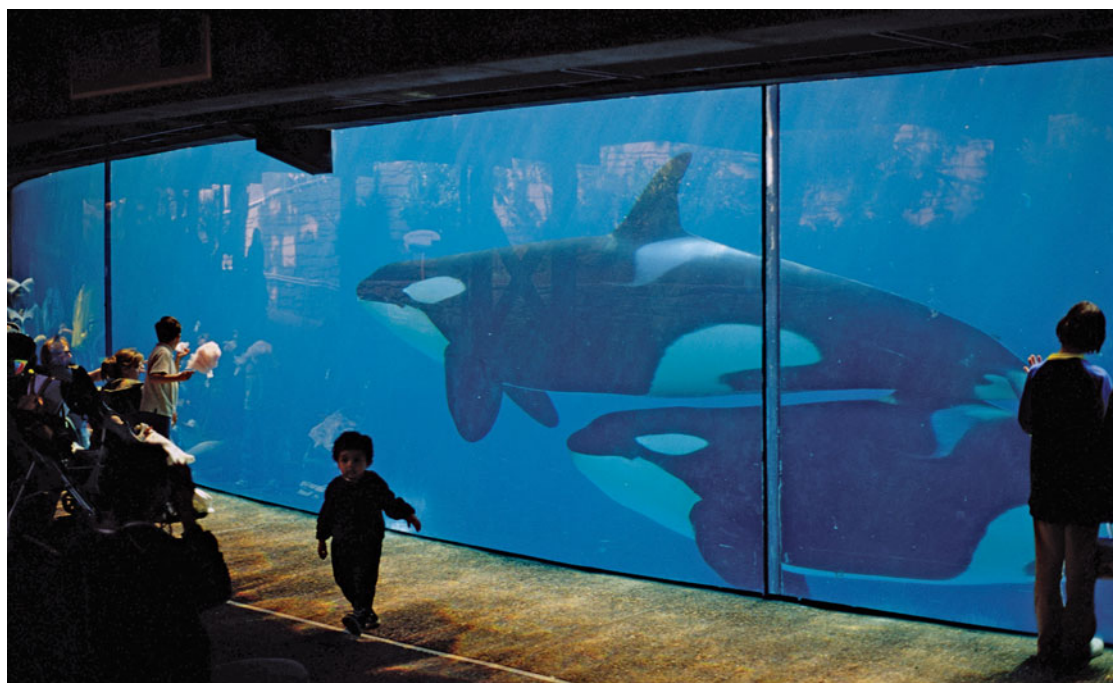
Fruit • Peach • Plum

Aquarium

An aquarium can be a small container for a few goldfish. It can also be a building that displays a large collection of water animals. Aquariums give people the chance to observe an ecosystem very different from their own.

Types of Aquariums

People who like fish often keep aquariums as a hobby. Popular fish for home aquariums include goldfish, guppies, zebra danios, and bettas. Home aquariums can be as small as a bowl or as large as an entire wall. For their fish to sur-



Orca whales swim past visitors to a public aquarium.

vive, owners must make sure that their aquariums stay clean and that the water is at the right temperature. They also must provide the right type and amount of food.

Public aquariums are buildings with large tanks of fish and other water animals. Different tanks contain fish, animals, and plants from cold, warm, fresh, and salty waters. People come to see and learn about fish and their habitats. Public aquariums often care for sick or injured water animals, too. Marine biologists help the animals to get well and then return them to the wild.

History

People have kept fish in artificial habitats for at least 4,500 years. The ancient Egyptians and Romans kept fish in

aquariums. The Chinese bred goldfish in ponds and bowls. Artificial ponds filled with fish later became popular in European gardens. The trend spread to North America in the 1800s. In 1853 the Zoological Society of London, England, opened the first public aquarium. Public aquariums soon opened in many other major cities.

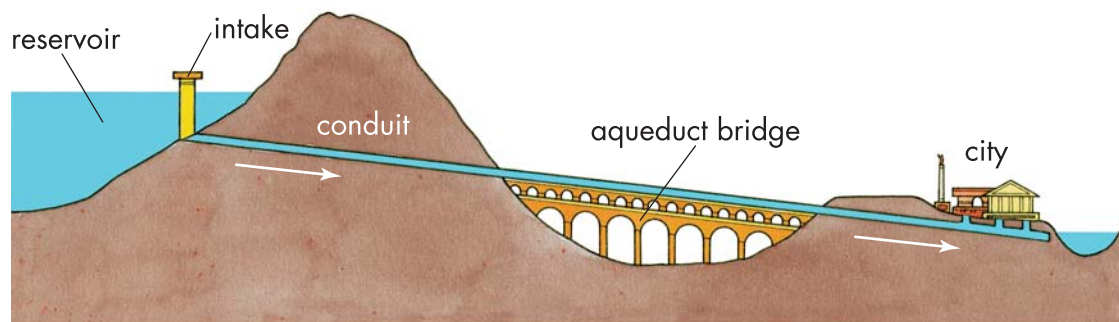
► More to explore

Ecology • Fish • Goldfish

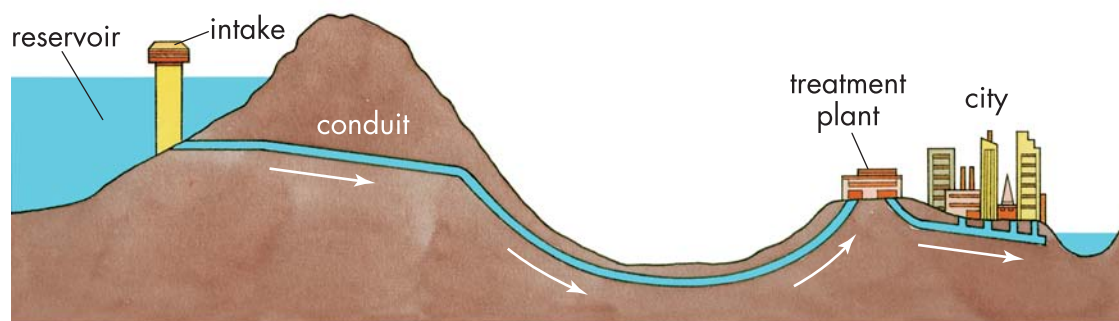
Aqueduct

An aqueduct is a system for carrying water. Aqueducts can supply water to cities or to farms for irrigation. The water is carried from a lake, river, or reservoir through a conduit, or channel. The channel may be an underground

Roman Aqueduct



Modern Aqueduct



Early aqueducts had to rely on the force of gravity to move water over long distances. This meant that the water could only move from a high point to a lower point. Modern aqueducts use electric pumps to move the water along.

tunnel or pipe, a canal at ground level, or a bridge.

People built aqueducts in ancient Greece, Babylonia, Persia (now Iran), and India. Many of these aqueducts were tunnels dug into hillsides. Early aqueducts depended on gravity to create the flow of water. The water source had to be higher than the destination so the water could flow downhill all the way there. Variations in the height of the land, such as mountains and valleys, caused problems.

To move water across valleys people sometimes built aqueducts in the form of arched bridges with two or three layers of arches on top of each other. The water flowed through a channel in the top of the uppermost layer. The ancient Assyrians used 2 million stone blocks to build an aqueduct to carry water across a valley to their capital, Nineveh.

Ancient Rome had a complex system of 11 aqueducts built from 312 BC to AD 226. The system used both bridges and underground pipes. Some of the aqueducts are still used today. The Romans also built aqueducts in other parts of their empire.

Most engineers today use powerful pumps to force water upward when necessary. This allows modern engineers to design aqueducts in ways that ancient engineers could not. Instead of building a bridge over a valley, for example, modern engineers can simply run pipes down one side of the valley and up the other. Pumps powered by steam were

first used in the late 1700s. Later pumps were powered by electricity.

► More to explore

Bridge • Canal • Rome, Ancient

Arabian Peninsula

The Arabian Peninsula, or Arabia, is a piece of land in southwestern Asia. It is the original homeland of the Arab people. It is also the birthplace of the religion of Islam. The country of Saudi Arabia takes up about four fifths of the peninsula. The peninsula also includes Kuwait, Oman, Qatar, the United Arab Emirates, Yemen, Bahrain, and parts of Jordan and Iraq.

Geography

The Arabian Desert covers almost all of the peninsula. Some parts of the desert get enough rain for grass and shrubs to grow. In general, however, the climate is very dry and hot. At least one third of the desert is sandy. Other parts are cov-

Did You Know?

The Inca people of South America built a system of aqueducts to carry water down from the Andes Mountains. One Inca aqueduct was 360 miles (579 kilometers) long.





The Arabian Desert features large areas of mountains and raised flat areas called plateaus.

ered by bare rock. There are some hills and mountains.

The Arabian Peninsula has almost half of the world's supplies of petroleum (oil). Most of the oil is in or near the Persian Gulf, the body of water east of the peninsula. The countries of the region sell the oil to other countries.

People

Arabs make up most of the population of the peninsula. Nearly all Arabs speak the Arabic language. Most Arabs are Muslims, or followers of Islam. Muhammad, the founder of Islam, was born in what is now Saudi Arabia.

History

In ancient times the Sabaeans, the Minaeans, and the Himyarites built up powerful kingdoms in southwestern Arabia. These Arab peoples traded with Egypt, China, and India.

In the 600s Muhammad started Islam. Soon all of Arabia was united under the

religion. Then the Arabs spread Islam beyond the peninsula by conquering other lands. The Muslim leaders who followed Muhammad ruled a large Islamic empire. At first they ruled from Arabia. Later, however, they ruled from other parts of the empire.

In the 1500s the Ottoman Turks made Arabia part of their empire. However, they never gained firm control of the peninsula. The Arabs revolted repeatedly against the Ottomans. The Sa'ud family controlled the middle part of Arabia.

Meanwhile, the British took control of most of the southern and eastern coasts of Arabia. The local Arabian rulers united with the British against the Ottomans. They defeated the Ottomans in the early 1900s. Then the peninsula gradually became free from British rule. By 1971 the peninsula was made up entirely of independent countries. In 1990 the countries of North Yemen and South Yemen were united to form the Republic of Yemen.

► More to explore

Arabs • Islam • Petroleum • Saudi Arabia

Arab-Israeli Wars

Since the creation of Israel in 1948, the Jewish state has gone to war with its Arab neighbors on several occasions. The differences between the groups continued into the 21st century.



A map shows the territories that Israel and its neighbors fought over during the Arab-Israeli wars. At the end of the Yom Kippur War in 1974 Israel controlled the area marked in orange.

Background

The Middle Eastern region known as Palestine was the ancient home of the Jewish people. It became part of the Islamic world in the AD 600s. From 1923 to 1948 the British ruled the region. During this time, many Jewish immigrants from Europe settled there. Arabs also lived in Palestine, and both groups wanted to control the land.

When Britain gave up Palestine, the United Nations (UN) divided the land. Each group got the same amount, but the Arabs were unhappy because the Jews were given some land that was owned by Arab Palestinians.

The War of 1948–49

On May 14, 1948, as soon as Israel came into existence, Arab Palestinians and neighboring Arab countries declared war on Israel. Arab forces occupied parts of Palestine, but by the time the war ended Israel ended up with more land than it had before the war.

In 1949 Israel and the Arab states signed border agreements. There was no peace treaty, however. The many Palestinians who had left their homes ended up in refugee camps in Arab countries.

The Six-Day War

In the spring of 1967, fighting between Syria and Israel led to the Six-Day War. Israel saw that Egypt was preparing for war in order to aid Syria. On June 5 Israel struck quickly and wiped out nearly the whole Egyptian air force on the ground. In six days' time Israel seized the Old City of Jerusalem, the Sinai Peninsula, the Gaza Strip, the Jordanian territory west of the Jordan River (known as the West Bank), and the Golan Heights, on the Israeli-Syrian border.

The Yom Kippur War

On October 6, 1973, on the Jewish holy day of Yom Kippur, Egypt and Syria both attacked Israel. In the Yom Kippur

War, Israel pushed both armies back into their own territory but in turn suffered heavy losses. After fighting ceased early in 1974, the UN established neutral zones between those countries and Israel.

Ongoing Tensions

On March 26, 1979, Israel and Egypt signed a peace treaty. Tensions continued, however, between Israel and other Arab communities. The Palestine Liberation Organization (PLO) attacked Israel from camps in Lebanon in 1982. On June 5, 1982, Israel invaded the country. The PLO eventually left, but some Israeli troops remained in the country until 2000.

In the late 1970s Israelis began to build settlements on the land that it occupied on the Gaza Strip and West Bank. In 1987 the growth of these settlements caused Palestinians to protest. Demonstrations and riots—known as the intifada (uprising)—broke out and continued until the early 1990s. In 1993 Israel agreed to start turning over control of some of the occupied territories to the Palestinians. In 2000, however, a new intifada erupted. It stalled peace talks between Israel and the Palestinians.

► More to explore

Arabs • Egypt • Israel • Jerusalem
• Middle East • Palestine • Palestine Liberation Organization • Syria

Arabs

An Arab is someone whose native language is Arabic. The term was first used



Arabs shop at a street market in Cairo, Egypt.

to describe people who lived in a part of southwestern Asia called the Arabian Peninsula. Today the word Arab also refers to Arabic-speaking people who live in the Middle East, North Africa, and other places. In the early 21st century there were more than 100 million Arabs throughout the world.

Early Arabian society was made up of families that came together to form tribes. Tribes traced their heritage back many centuries. According to tradition, some Arabs are descended from a man named Qahtan, who lived in southern Arabia. Others are descended from a man named 'Adnan, of northern Arabia.

The religion of Islam brought Arabs together beginning in the early AD 600s. Because Islam's holy book (the Koran) is written in Arabic, that language soon was used by all who practiced the religion.

More than 90 percent of modern Arabs practice Islam. Religion is an important part of everyday life for many Arabs. It influences how people behave and dress. Arabs, especially women, tend to dress modestly. In many areas women are expected to wear dark robes and to cover their face with a veil in public.

Arabs who live in cities tend to have less traditional attitudes than those who live in small villages. Both men and women have more educational and employment opportunities in cities.

► More to explore

Arabian Peninsula • Islam

Aral Sea



The Aral Sea is a saltwater body in central Asia. The sea's name comes from the Kyrgyz word *Aral-denghiz*, meaning "Sea of Islands," because of the many islands in its waters.

Also called Lake Aral, the Aral Sea is situated more than 250 miles (400 kilo-

meters) east of the Caspian Sea. It is bordered by Kazakhstan on the north and Uzbekistan on the south. The Amu Darya and Syr Darya rivers are the sea's two main sources of inflowing water. The Aral Sea area has cold winters and hot summers. The area gets very little rainfall.

In 1960 the Aral Sea covered an area of 26,300 square miles (68,000 square kilometers). However, during the second half of the 1900s, most of the inflowing river water was used for irrigation before it reached the sea. The sea also loses water through evaporation. Because there is not much rainfall this water is not replaced fast enough to maintain the water level. The Aral has therefore shrunk drastically in its area and volume. By the end of the 1900s the Aral Sea had lost so much water that the exposed land divided the sea into three separate parts.

Scientists view the changes to the Aral Sea as a serious threat to the local environment and human health. As the water has evaporated, the salt and mineral content has risen dramatically. This has made the water unfit for drinking and killed the once-abundant supplies of freshwater fish. The fishing industry along the Aral Sea was virtually destroyed. Many groups tried to address these issues, but the problems continued into the 21st century.

► More to explore

Kazakhstan • Uzbekistan

Arapaho



An Arapaho man wears the traditional clothing of his people.

The Arapaho are Native Americans who originally lived in the Great Lakes region. They gradually moved westward and became great buffalo hunters and warriors of the western Great Plains.

The Arapaho traditionally were farmers, but as they moved west they began hunting instead. Bison (buffalo) meat became their main source of food. They used bison hides to make clothing and covers for their tepees.

The Arapaho were very religious people. They believed that sacred objects had supernatural power. Their most sacred object was the Flat Pipe, a tobacco pipe with a very long stem. They used this pipe only during special religious ceremonies.

By the mid-1800s the Arapaho had separated into two groups. The Southern Arapaho lived in what is now Colorado, and the Northern Arapaho lived in what is now Wyoming.

The Arapaho were pressured by the U.S. government to move to a reservation. In 1869 the Southern Arapaho moved to land in Indian Territory, which is now part of Oklahoma. In 1878 the Northern Arapaho moved to the Shoshone Reservation (now called the Wind River Reservation) in what is now Wyoming. Later in the 1800s both Arapaho groups lost much of their reservation lands to white settlers. At the end of the 20th century more than 6,000 Arapaho lived in the United States.

► More to explore

Native Americans

Arawak

The Arawak Indians once lived in South America and on islands in the Caribbean



The Arawak people were forced to leave the islands of the Lesser Antilles long ago. They left behind stone carvings and pottery.

Sea. The island Arawak, or Taino, were the Indians the explorer Christopher Columbus met on his first journey to the Americas.

The Arawak lived in large villages. They built their houses from logs, poles, and the leaves of palm trees. They got most of their food by farming. They also fished, caught shellfish, and hunted birds, lizards, and other small animals.

The Arawak first lived in northern South America. Then they spread to the Caribbean islands. Shortly before Europeans arrived, the warlike Carib people pushed the Arawak off the islands called the Lesser Antilles. Columbus met the Arawak in 1492. At that time the Arawak lived only on the Greater Antilles (Cuba, Jamaica, Hispaniola, and Puerto Rico).

Columbus' men and the Spaniards who followed them treated the Arawak harshly. They forced the Arawak to work in fields and in mines. Some Arawak died of starvation. Many others died of diseases brought by the Europeans.

By 1550 the island Arawak population had been reduced from 1 million or more to almost nothing. Their traditional way of life largely disappeared as well. Small groups of Arawak managed to survive. Their descendants now live in Cuba, Puerto Rico, and Florida.

► More to explore

Carib • Columbus, Christopher

Arbor Day

A day set aside for the planting of trees, Arbor Day began in Nebraska in 1872. Today people across the United States celebrate Arbor Day.

How Arbor Day Is Celebrated

Many states observe Arbor Day on the last Friday in April, though the date may vary depending on the climate. On Arbor Day people plant trees throughout their neighborhood. They plant trees as memorials to loved ones, to restore damaged landscapes, or just to add natural beauty to the surroundings.

History

J. Sterling Morton, a newspaper editor and politician, founded Arbor Day. In 1854 he moved from Michigan to Nebraska, which was then a territory. The Nebraska Territory was a land of rolling plains with few trees. Morton missed the trees he had known in the East.

After Nebraska became a state, Morton asked the state to create a holiday for



Girl Scouts plant a tree on Arbor Day.

Did You Know?

The largest Arawak villages had as many as 3,000 people living in them.

tree planting. Nebraskans celebrated the first Arbor Day in 1872. Arbor Day became a legal state holiday in 1885. The holiday later spread across the United States as well as to other countries.

Archaeology

Archaeology is the study of things that people made, used, and left behind. The goal of archaeology is to understand what people of the past were like and how they lived. Scientists who study archaeology are called archaeologists.

An archaeologist's work begins with finding a site to study. Some sites, such as ancient cities, are visible on the surface. Other sites are buried. Special devices can be used to sense structures that are underground or underwater.

After finding a site, an archaeologist digs slowly and carefully. This work is called excavation, or a "dig." Archaeologists use spoons, knives, picks, brushes, and other tools in their work. They try to uncover buildings, tools, weapons, art, and anything else that people made. These items are called artifacts.

Then archaeologists study the objects. They want to know when an artifact was made, what it was made from, and what it was used for. Archaeologists have several methods for figuring out an artifact's age. One method is called carbon-14 dating. Carbon-14 is a chemical found in all organisms, or living things. After an organism dies, the amount of carbon-14 decreases at a certain rate. An archaeologist measures this decrease to find out how long ago the organism died.



Archaeologists uncovered life-size figures of soldiers in an ancient tomb in China.



A team of archaeologists works on a "dig," or excavation, in Peru.

Archaeologists also try to understand the culture from which artifacts came. For example, tools such as arrow tips, knives, and grinding stones can tell an archaeologist how people got and prepared their food.

An archaeologist sometimes works with experts from other fields of study. Botanists, zoologists, and geologists can help to identify plants, animals, soils, and rocks found along with artifacts.

► More to explore

Botany • Geology • Zoology

Archaeopteryx

A prehistoric bird, *Archaeopteryx* is best described as a feathered dinosaur with wings. *Archaeopteryx* is considered proof that birds developed from dinosaurs, because it had the traits of both.

When and Where *Archaeopteryx* Lived

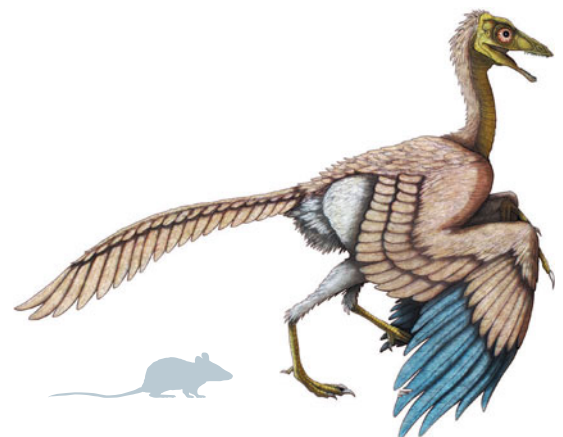
Archaeopteryx lived about 159 to 144 million years ago. All known *Archaeopteryx* remains have been found in southern Germany.

Physical Features

Archaeopteryx reached 2 feet (60 centimeters) in length and had a wingspan of 2 feet (60 centimeters). It had wing feathers like those of modern pigeons. *Archaeopteryx* also shared several features with a group of small, meat-eating dinosaurs, however. It had well-developed teeth and a long, slender and flexible neck. It had long leg and foot bones, and it had claws on its hands.

Behavior

Some scientists believe that *Archaeopteryx* took off by running along the ground and leaping into the air, flapping its wings. However, other experts believe that *Archaeopteryx* most likely spent a lot of time perched in low-growing trees. The animal could simply launch itself from atop the branches and glide out on short flights. When it was not in the



Archaeopteryx

trees it is possible that *Archaeopteryx* swam and fished in the lagoons surrounding the islands on which it lived. *Archaeopteryx*, like both dinosaurs and modern birds, reproduced by laying eggs.

► More to explore

Bird • Dinosaur

Archery

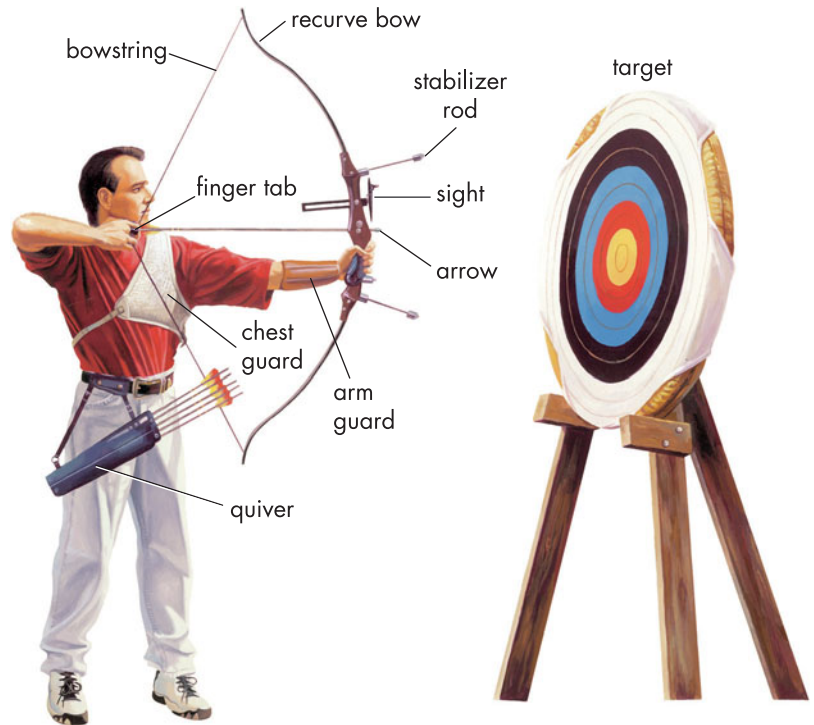
The sport of shooting arrows with a bow at a target is called archery. But archery is not just a sport. For thousands of years people used the skills of archery mostly for war and for hunting. Even today bow hunting is a popular activity.

Bows and Arrows

Bows allow people to shoot arrows farther and with greater force than is possible by simply throwing them. At its most basic, a bow is a long, thin piece of wood with a string stretched tightly from one end to the other. The string holds the wood in a curved position. People competing in archery contests today often use more complex bows made of wood, plastic, or fiberglass.

An arrow is a long, thin piece of wood, metal, or other material. It ends in a pointed tip. Near the other end of the arrow is a tail of feathers or plastic fins. The tail helps the arrow fly straight.

The tail end of the arrow fits onto the string of the bow. To shoot the arrow, an archer pulls the string back and lets it go. A lot of energy is stored up by the string being stretched. When the string



Modern archers shoot at targets up to 295 feet (90 meters) away.

is released, this energy is also released. This sends the arrow flying with great force.

Archery Competitions

There are many kinds of archery events. In most kinds the archers shoot arrows at round targets. Each target is marked with a circle surrounded by several rings. Archers earn a set number of points for hitting the various areas on the target with their arrows. They earn the most points for hitting the circle in the center and the least points for hitting the outer ring.

The most common types of archery used in contests are target archery and field archery. In target archery archers shoot a set number of arrows at targets at set distances. For example, an archer

may have to shoot 18 arrows at a target that is 230 feet (70 meters) away. In field archery the archer shoots arrows at several targets on a course set up to imitate hunting conditions.

World championships are held regularly in target, field, and other kinds of archery. The Summer Olympic Games feature target archery events for men and women, individually and in teams.

History

In prehistoric and ancient times many peoples in Europe, Asia, Africa, and the Americas made bows and arrows. The bow was one of the main weapons of war and hunting. The ancient Egyptians, Greeks, and Chinese also practiced archery as a sport.

The Huns, the Turks, the Mongols, and other groups used the bow and arrow for warfare while riding on horseback. Their

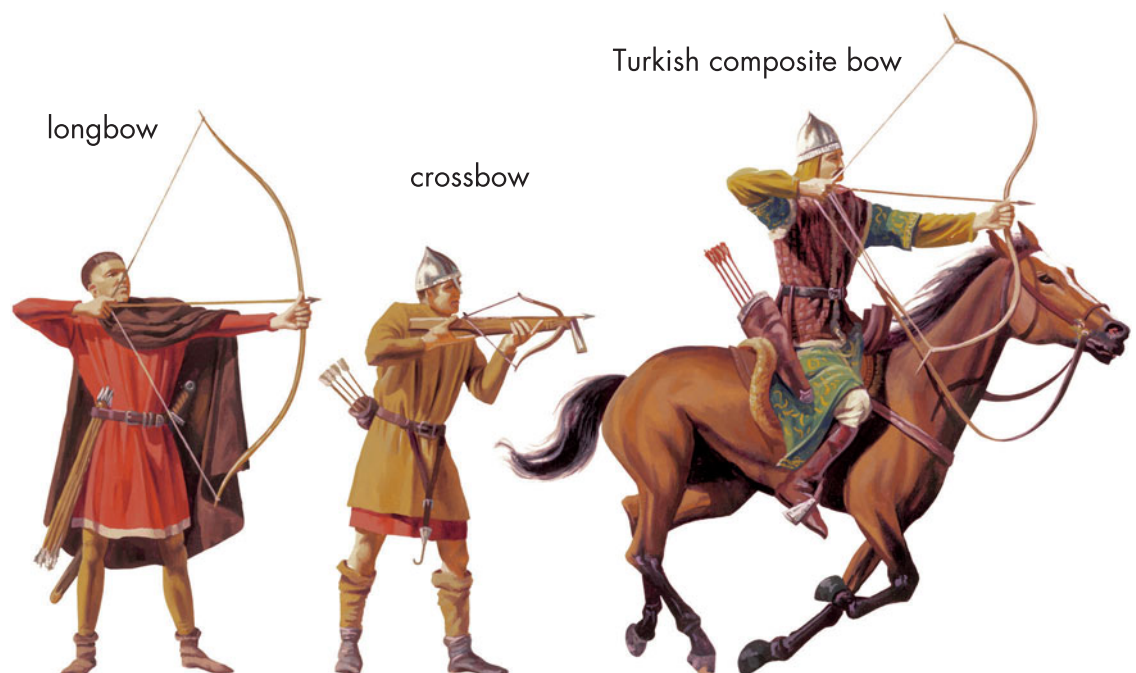
skills as archers helped them conquer large parts of Asia.

English soldiers began using a large bow called the longbow in the 1300s. It helped them win great military victories against France. The leading bow in other parts of Europe at the time was the crossbow. It was a small, powerful bow attached crosswise to a piece of wood. It had a groove to guide the arrow across the wood and a lever to pull and release the string.

In Europe guns replaced the bow and arrow as the major military weapon in the 1500s. Today soldiers in most parts of the world use firearms. However, many people still use a bow and arrow to hunt. Archery has also grown popular as a sport. In the 1900s archery became an Olympic event.

► More to explore

Olympic Games • War • Weapon



Hundreds of years ago warriors used bows and arrows to fight battles.

Architecture

The science and art of designing buildings is known as architecture. People who practice architecture are called architects. Architects express an artistic vision through the size, shape, color, materials, and style of a building's elements. But unlike painters or sculptors, who can create a work of art for its own sake, architects must design a building for a specific purpose. The architect can produce a work of art, but it must also be functional.

Elements of Design

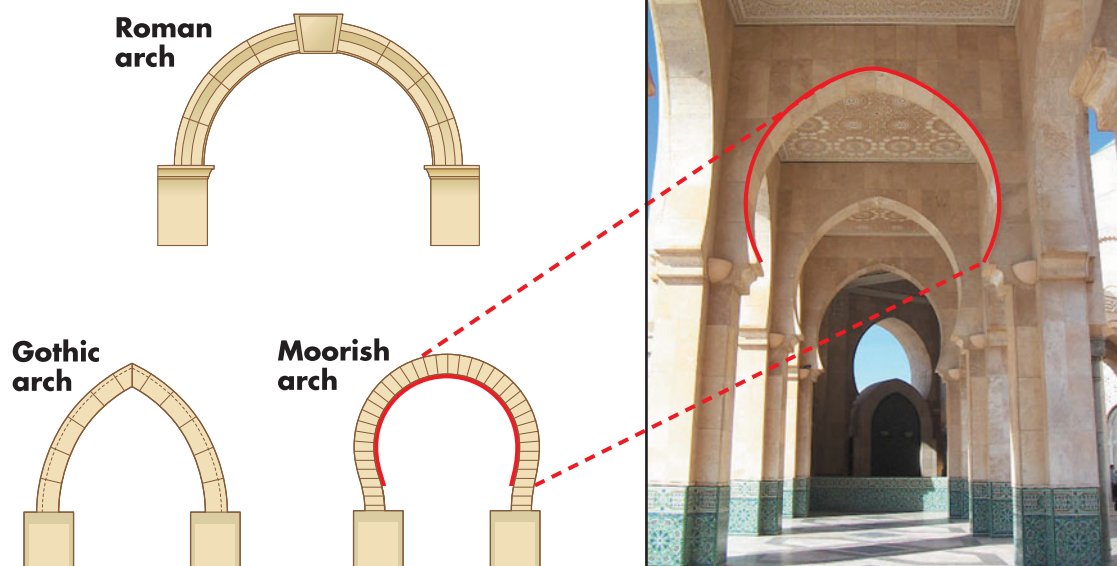
The architect must consider how a structure will be used and by whom. An apartment building, a palace, a hospital, a museum, an airport, and a sports arena all have different building requirements. Another factor in the design is the ideas the structure should communicate. For example, some buildings are designed to impress people with a display of power

and wealth. Others are intended to make everyone feel welcome.

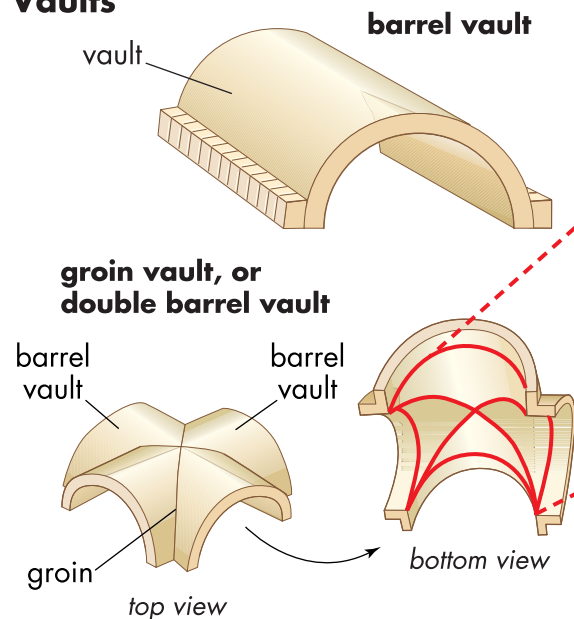
Other factors are the location and surrounding environment, including weather, and the cost of materials. And above all the architect must create a stable structure. Walls and roofs can buckle, crack, or collapse if they are not properly designed. Over the centuries, as people discovered building techniques that worked, those features became standard elements of design.

The arch was one of the first elements of this kind. It is a curved structure used to span an opening and support loads from above. It allowed builders to create larger doorways and other openings in walls. The vault is a continuous arrangement of arches, usually forming a ceiling or roof. Another common support element is the truss, or frame composed of triangular sections.

Arches



Vaults



Materials

Building materials are chosen based on many factors, including their appearance, strength, availability, and cost. Stone, brick, wood, and concrete have been used for thousands of years. Stone has often been used for large monuments because it lasts a long time and is easy to carve. But it is difficult to cut and transport, and it is too weak for certain support functions. Brick resists fire and is easy to produce, transport, and lay. Wood is very easy to acquire, transport, and work. But it burns easily, can develop mold, and may be eaten by termites. Concrete is made by mixing cement, water, and small pieces of sand and stones. It can be poured into molds to create various shapes, and it hardens into a solid, fire-resistant material.

A major advance came in the 1800s with the use of cast iron and then steel for support elements. These materials are fire-resistant, can be formed into many

shapes, and can produce very strong, tall structures. Builders also began embedding steel rods in concrete to make the concrete stronger.

History

The earliest buildings were simple structures made of materials that were easy to find. Eventually people began to live in large groups and form communities. As they did so their buildings became more elaborate. The Great Pyramids of the ancient Egyptians were enormous stone



A pyramid in Saqqarah, Egypt, was built for an ancient Egyptian king.

tombs for their leaders. In ancient times people in what is now Iraq built huge brick temple towers, called ziggurats, that were shaped like pyramids with several levels rising in steps.

The traditional architecture of China also developed in ancient times. It reflects a deep feeling for the harmony and order in nature. Traditional temples and houses are built chiefly of wood and decorated with tiles. The pagoda, a tower stretching toward heaven, developed from the stupa of ancient India. The stupa was a dome-shaped monument, usually built over the remains of a holy person.

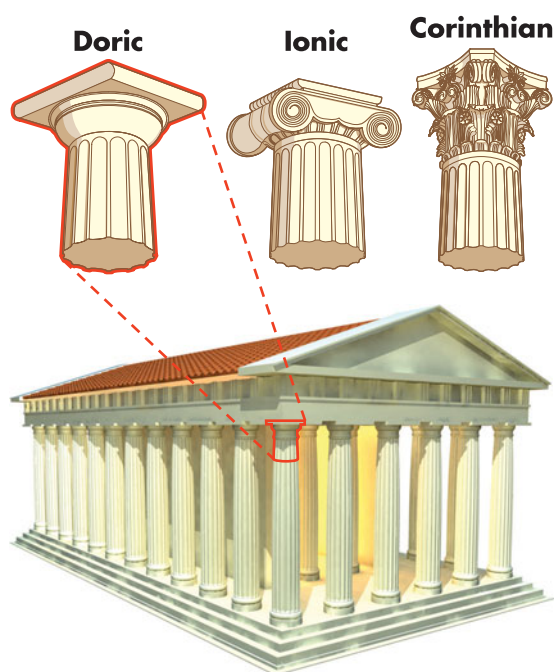
Ancient Greece and Rome

The ancient Greeks and Romans established what became known as the classical style in Western architecture. The Greeks built simple structures of marble and stone. They developed three

styles—called Doric, Ionic, and Corinthian—identified by the type of columns they use as a basic unit. Each type of column had a special design, called a capital, at the top. These styles have been used in Western architecture ever since. A Greek temple was rectangular and had a porch, called a portico, at each end. Lines of columns supported the roof. An outstanding example is the Parthenon on the Acropolis in Athens.

The ancient Romans used round arches and other structural methods that allowed them to build enormous public buildings. An amphitheater was a large round or oval arena surrounded by several rings of seats at different levels. One of the most famous amphitheaters, the Colosseum, was built in Rome in about AD 70. A Roman basilica was a rectangular public building with a raised platform at one or both ends. The early Christians adopted the shape of the basilica for their churches.

Greek Capitals



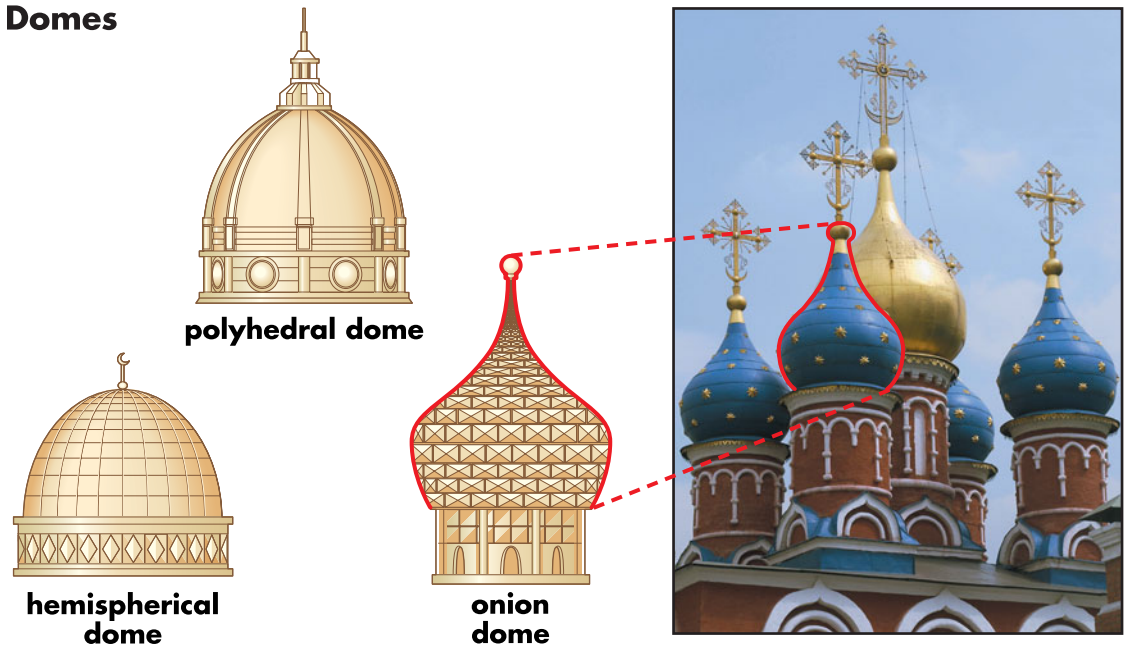
Middle Ages

As Christianity spread throughout Europe during the Middle Ages (about AD 500 to 1500), many new churches were built. In the east, Eastern Orthodox Christianity was practiced in the Byzantine Empire. A typical Byzantine-style church had a large dome on top of a square building. Inside were marble pillars and much decoration. The most famous building in this style is the Hagia Sophia in Istanbul, Turkey, completed in 537. As the Eastern Orthodox church spread to Greece, eastern Europe, and Russia, domed churches were built there too.

Did You Know?

U.S. architects copied ancient Roman styles in their designs for the U.S. Capitol and many other government buildings.

Domes



Roman Catholicism became powerful in western Europe. In the 900s and 1000s some of the new Catholic churches used ancient Roman architectural elements, such as the round arch. Their style is therefore known as Romanesque.

From the mid-1100s to the 1500s, a new style of architecture, known as Gothic, was used in western Europe. Advances in construction methods enabled building interiors to be made much taller and broader. Pointed arches were used instead of round ones, and vaults made of a series of arched stone ribs supported the ceiling. New techniques also allowed for thinner walls with large windows filled with stained, or colored, glass.

Rise of Islam

Islam developed in the Middle East in the 600s and spread to northern Africa, southern Asia, and parts of Europe. Architecture became the most

important expression of Islamic art, especially in mosques. Mosques usually have a large open space for prayer and an attached tower called a minaret. Sacred writing may provide decoration, but no paintings or statues are used. Early Islamic monuments include the Dome of the Rock (finished in 691) and Al-Aqsa mosque (700s), both in Jerusalem, and the Great Mosque of



A tomb in Agra, India, is made of white marble. It was built during the reign of the Muslim rulers known as the Mughals, in the 1600s.

Córdoba, Spain (700s–900s). In southern Asia, Islamic architecture came to include Hindu and Persian elements too. White marble and red sandstone were often used. A famous example of this style is the Taj Mahal, a tomb built in Agra, India, in the 1600s.

Renaissance, Baroque, and Later Styles

A period called the Renaissance began in Italy in the 1300s. Renaissance architects revived classical Greek and Roman styles, using columns, round arches, and domes. Among the famous Italian Renaissance architects were Filippo Brunelleschi, Bramante, Leon Battista Alberti, and Andrea Palladio. The Renaissance style spread from Italy to the rest of Europe.

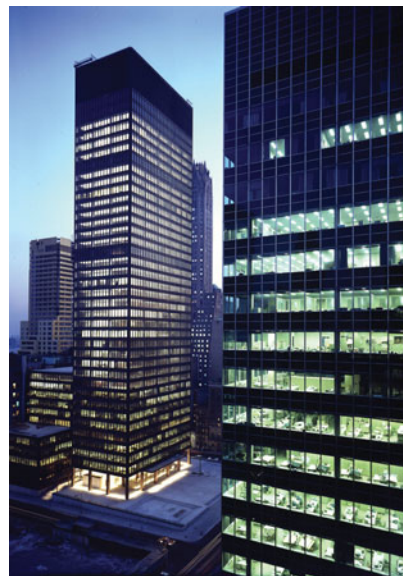
Baroque architecture became popular in southern Europe in the 1600s. It emphasized dramatic and elaborate decorations, vivid colors, and luxurious materials. In France and England the baroque was more subdued and was often mixed with the classical style.

In the 1700s some European architects returned to a simpler style called neoclassicism (or new classicism). In England the ancient form of the Roman villa was adapted to suburban and country houses. In the 1800s Gothic styles became popular again in England and the United States. Renaissance and baroque styles were also used in the United States for houses and public buildings.

Modern Developments

The growing population and rising cost of land in cities in the late 1800s made it necessary to put tall buildings on small lots. As buildings got taller the walls had to become stronger. In 1885 William Le Baron Jenney designed the Home Insurance Company Building in Chicago, Illinois. It was the first building in which the exterior walls were entirely supported on an internal steel frame. The steel frame led to the skyscraper age.

One of the most influential architects of the skyscraper was Chicago's Louis Sullivan. He believed that a building's design should reflect its function, and he often used decoration based on natural forms. His student Frank Lloyd Wright became one of the most influential architects of the 1900s. He thought buildings should be in harmony with their natural surroundings and the people who use them.



The clean, simple lines of modernist architecture are shown in buildings designed by Mies van der Rohe.



The MARTa museum in Germany was designed by Frank Gehry.

His Prairie style emphasized horizontal lines in houses with low, gently sloping roofs.

Modernist buildings of the mid-1900s typically had plain, rectangular forms with no extra decoration. The architect known as Le Corbusier designed buildings in France with flowing interior spaces, flat roofs, and large windows in plain white walls. German architect Ludwig Mies van der Rohe designed steel and glass structures in simple geometric forms with clean lines.

Beginning in the 1960s some architects reacted against what they saw as the cold, bare forms of modernism. These architects were called postmodern. They included Philip Johnson, Robert Venturi, and Michael Graves. Some of them playfully used classical features such as arches and columns in new ways. Starting in the late 20th century architects such as Frank Gehry moved away from traditional right angles. They featured free-form curves in many of their designs.

► More to explore

Acropolis • Brick and Tile • Cathedral
• Concrete • Church • Egypt, Ancient
• Greece, Ancient • Iron • Middle Ages
• Mosque • Pyramid • Renaissance
• Skyscraper • Steel • Taj Mahal
• Temple

Arctic Ocean

The Arctic is the smallest of the world's oceans. It occupies the most northern region of Earth. The North Pole is near the center of the Arctic Ocean.

Physical Features

The Arctic Ocean covers an area of 5,440,000 square miles (14,090,000 square kilometers). The landmasses of Eurasia (Europe and Asia), North America, and Greenland surround the ocean. The Arctic has several islands on its edges but none in the center, where there is a permanent cover of ice. A narrow passage called the Bering Strait connects the Arctic Ocean with the Pacific Ocean. The Greenland Sea connects the Arctic with the Atlantic



Ocean. The deepest point in Arctic waters is 18,050 feet (5,502 meters), but the average depth is 3,240 feet (988 meters).

Two forms of ice are found in the Arctic Ocean: sea ice and pack ice. Sea ice is frozen seawater that forms and melts depending on the season. The mass of sea ice that remains frozen year after year is called pack ice. Pack ice is generally smoother and less salty than other sea ice.

The pack ice in the Arctic is hundreds of miles across. It drifts around the ocean in a clockwise direction. It completes one revolution around the North Pole every 10 years.

Climate

All Arctic waters are cold, and the climate in the Arctic regions is among the harshest in the world. The coldest temperatures can drop to -85°F (-65°C), especially at the end of the long Arctic winter.



A walrus sits on top of an iceberg in the Arctic Ocean.

Economy

Because of the ice in the Arctic, there are very few fish in the main body of the ocean. However, some of its surrounding seas—the Barents, Greenland, and Bering seas—are rich fishing grounds. Whale hunting, or whaling, was once a major Arctic industry, but governments now limit it to protect the whales. People still hunt seals in some areas.

Exploration

The Dutch and the English became the leaders in Arctic exploration in the early 1500s. They were seeking a route, called the Northeast Passage, across the Arctic to the Far East. A Swedish explorer finally made the trip in 1878–79. He sailed from Norway, through the Russian side of the Arctic Ocean, and out into the Pacific. In the 1880s and 1890s Fridtjof Nansen, a Norwegian explorer, made more important explorations of the Arctic Ocean.

Later explorers used dog sleds to try to get across the ice to the North Pole. The U.S. explorers Robert E. Peary and Matthew Henson claimed to be the first to reach the North Pole, in 1909.

Environmental Issues

Hunting in the Arctic has endangered several types of animals, including whales and walrus. Other economic activities are also cause for concern. Oil tankers that sail through the Arctic waters are threatened by ice. If damaged, they can release tons of oil into the ocean waters.

Did You Know?

At the North Pole the sun does not rise above the horizon for six months of the year. For the rest of the year the sun never sets.

Global warming may be the most serious environmental problem for the Arctic Ocean. Global warming is a slow rise in Earth's temperature that may be caused by pollution. Some scientists warn that this warming could cause the Arctic pack ice to melt. The levels of oceans around the world would then rise, and many coastlines would disappear.

► **More to explore**

Global Warming • Ocean • Polar Exploration

Ares

In ancient Greek mythology Ares was the god of war. He was one of the 12 major gods believed to live on Mount Olympus. His bird was the vulture, and his animal was the dog. Ares is associated with Mars, the god of war in ancient Roman mythology.

Ares was the son of Zeus, the chief god, and his wife, Hera. Ares was said to have loved Aphrodite, the goddess of love. Ares and Aphrodite had several children.

Even though Ares was one of the main Greek gods, people did not worship him much. The ancient Greeks thought Ares was cruel. They believed that he enjoyed sending war and disease to humans.

Unlike Ares, Mars was a popular and important god. The Romans thought of Mars as a powerful nature god, as well as the god of war. They prayed to him to protect their crops and farm animals. The month of March was named after Mars because it was the time when



farmers began to plant their crops. Mars, the fourth planet from the sun, was also named after him.

► **More to explore**

Aphrodite • Mythology

Argentina



Parts of Patagonia are cold enough to be covered by glaciers. Glaciers are masses of moving ice.

The country of Argentina takes up most of the southern part of South America. Its name is a Spanish word meaning “Land of Silver,” after the silver found there by Spanish explorers. The capital is Buenos Aires.

Geography

Argentina is bordered by Chile, Bolivia, Paraguay, Brazil, and Uruguay. The Atlantic Ocean lies to the east.

Argentina has four major regions: the Andes, the North, the Pampas, and Patagonia. The Andes Mountains run along the western edge of the country. Their highest peak is Mount Aconcagua, at 22,831 feet (6,959 meters). The North includes the Gran Chaco, an area of dry lowlands, and Mesopotamia, an area

between the Paraná and Uruguay rivers. The central Pampas are grasslands. Patagonia is a cold, dry, windy region in the south.

Tierra del Fuego is a group of islands off the southern tip of the continent. Argentina shares the islands with Chile.

Most of Argentina has a mild climate with cool, damp winters. The northeastern areas get the most rain.

Plants and Animals

Argentina’s plants vary widely from region to region. There are forests in the Andes, thorny trees and cactuses in the



Gran Chaco, and rain forests in Mesopotamia. In the Pampas there are grasses in the humid section and scrub forests in the dry section. Patagonia has zones of broadleaf forests, steppe, and desert.

Argentina also has a wide variety of wildlife. In the northwest live guanacos, llamas, and alpacas. Deer, monkeys, jaguars, and tapirs live in Gran Chaco and Mesopotamia. Herds of cattle and horses roam the Pampas. Parrots and canaries live in the southern tip of the country.

People

Most Argentines live in cities, especially Buenos Aires. Most of the population has European roots. About 10 percent of Argentines are American Indian or mestizo (a mixture of European and Indian). Spanish is the national language. Roman Catholicism is the main religion.

Economy

Banking and other services, manufacturing, and trade are the most important parts of the economy. Argentina's natural resources of petroleum (oil) and natural gas help its industries. Farmers produce soybeans, sugarcane, grains, beef, wool, and wine. Exported goods include food, petroleum, and metal products. Tourists also bring billions of dollars to Argentina each year.

History

Native peoples of what is now Argentina included the Tehuelche, the Querandí, the Puelche, the Diaguitas, and the Inca. Spaniards arrived in the early 1500s.

They founded the colony of Buenos Aires in 1536. The Europeans forced the native people to work for them.

Argentina was first part of Spanish Peru and then part of a province called Río de la Plata. Río de la Plata declared its independence in 1816 but soon broke up in a civil war. After the war, a series of dictators, presidents, and military leaders ruled Argentina.

In the 1900s Argentina suffered many economic and political problems. President Juan Perón, elected in 1946, and his wife Eva (Evita) were popular among workers for a time. However, the military overthrew Perón in 1955 and his third wife, President Isabel Perón, in 1976. The military government then imprisoned and killed thousands of citizens in what became known as the Dirty War.

In 1982 Argentina went to war with the United Kingdom over the Falkland Islands. The United Kingdom gained control of the islands. The defeat caused Argentina's military leader to step down. In 1983 the country held an election, which ended military rule. Leaders then worked to improve human rights and the economy. In the late 20th and early 21st centuries, however, rising poverty and unemployment led to protests throughout Argentina.

► More to explore

Andes • Buenos Aires • Falkland Islands
• Human Rights • South America
• Tierra del Fuego

Facts About ARGENTINA



Population
(2008 estimate)
39,737,000

Area
1,073,400 sq mi
(2,780,092 sq km)

Capital
Buenos Aires

Form of government
Federal republic

Major cities
Buenos Aires,
Córdoba, San
Justo, Rosario

Arikara

The Arikara tribe of Native Americans traditionally lived along the Missouri River in what is now in North Dakota. Originally their culture was related to that of the Pawnee tribe of present-day Nebraska. They are now associated with the Hidatsa and the Mandan peoples.

The early Arikara lived in villages situated along riverbanks. There they built dome-shaped houses made of mud packed around a wooden frame. They also constructed larger lodges, which they used for religious ceremonies.

Near their villages, Arikara women tended fields. They grew corn, beans, squash, sunflowers, and tobacco. Arikara men fished and hunted deer, elk, and bison (buffalo).

French and English traders regularly visited the Arikara to trade guns and other European goods for animal furs. In 1823 the Arikara killed 13 members of a white trading party, and soon after-

ward they became the first plains tribe to battle the U.S. Army.

During the 1800s, the Arikara population declined due to warfare and exposure to European diseases, such as smallpox. In order to protect themselves from their enemies, the survivors of the Arikara, Mandan, and Hidatsa tribes moved to a single village. The three tribes became officially known as the Three Affiliated Tribes in 1934. Today members of this group live on the Fort Berthold Reservation in North Dakota. At the end of the 20th century, there were about 900 Arikara living in the United States.

► More to explore

Hidatsa • Mandan • Native Americans
• Pawnee

Arithmetic

Arithmetic is the most elementary branch of mathematics. It is the part of mathematics that deals with counting as well as addition, subtraction, multiplication, and division. All of the other branches of mathematics use the principles and rules of arithmetic. Everyone uses arithmetic every day. It is used when buying something at a store, measuring distances, or simply counting to 10. The word arithmetic comes from the Greek word *arithmos*, which means “number.”

► More to explore

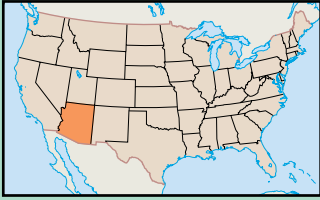
Abacus • Mathematics • Numbers and Counting Systems



Four Arikara Native Americans take part in a ceremony.

Did You Know?

The abacus is a tool for doing arithmetic. It was invented hundreds of years before the calculating machine.



Arizona

Arizona is known as the Grand Canyon State because of the amazing landform found in the northern part of the state. The awesome size and beauty of the Grand Canyon make it one of the most famous natural wonders in the world. Phoenix is Arizona's capital and largest city.

Geography

Arizona is located in the southwestern United States. The Colorado River separates Arizona from Nevada and California to the west. Arizona also borders Utah on the north, New Mexico on the east, and the country of Mexico on the south.

Mountains run across the state from northwest to southeast. To the south of

the mountains is a large area of desert plains, valleys, and smaller mountain ranges. Most of Arizona is very hot and dry during the summer and pleasant during the winter.

People

Though the majority of Arizonans are of European origin, the state is notable for its large Hispanic and Native American minorities. About one quarter of the people are Hispanic, mainly of Mexican heritage. The Native American population is larger than those of all states except Oklahoma and California. The Navajo are Arizona's largest native group. Many of them live on a huge reservation that covers parts of Arizona, Utah, and New Mexico. The state also has small African American and Asian minorities.

Most of Arizona's people live in the southern half of the state. Located in south-central Arizona, Phoenix is the state's major city. Other cities include Tucson, Mesa, Glendale, and Scottsdale. The University of Arizona is located in Tucson. Arizona State University's main campus is in Tempe, which is near Phoenix. In the north are Prescott and Flagstaff, the home of Northern Arizona University.

Economy

Businesses dealing in real estate and tourism are important parts of Arizona's economy. The state's main manufactured goods include computers and





The Hohokam people carved many designs into rocks hundreds of years ago. Today these carvings can be seen at Saguaro National Park in Arizona.

other electronic equipment, transportation equipment, and metal goods. Cotton and citrus fruit are major farm products. Other crops include vegetables and a variety of grains. Cattle are raised on large ranches. Arizona is also a major producer of copper.

History

Arizona has been home to Native Americans for thousands of years. Pre-historic peoples such as the Hohokam, the Anasazi, and the Mogollon developed advanced cultures in the region. When Spanish explorers arrived in the 1500s they found Hopi, Papago, and

Pima Indians. Later the Apache, the Navajo, and other tribes moved into the area.

In 1539 a Roman Catholic priest named Marcos de Niza claimed the land for Spain. For nearly 300 years the Spanish continued to explore and settle in the Arizona area. After gaining independence from Spain in 1821, Mexico ruled the area. The United States took control of the land in 1848, following its victory over Mexico in the Mexican War.

The discovery of gold, silver, and copper in the 1850s brought many miners to the area. The opening of railroads in the 1880s also brought settlers from the eastern United States into the area. Arizona became a territory of the United States in 1863 and a state in 1912. Copper mining remained the state's most important industry until the 1950s.

Arizona's population grew quickly after World War II. Many of the soldiers that had trained at military bases in Arizona returned with their families after the war ended.

Since the late 20th century Arizona has been one of the country's fastest-growing states. In 2000 it was the 20th state in population. By the end of the decade it had moved up to 14th.

► More to explore

Anasazi • Colorado River • Grand Canyon • Hohokam Culture • Navajo • Phoenix

Facts About ARIZONA

Flag



Population

(2000 census)
5,130,632—
rank, 20th state;
(2008 estimate)
6,500,180—
rank, 14th state

Capital

Phoenix

Area

113,998 sq mi
(295,254 sq
km)—rank, 6th
state

Statehood

February 14,
1912

Motto

Ditat Deus (God
Enriches)

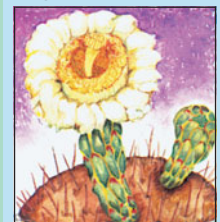
State bird

Cactus wren



State flower

Blossom of the
saguaro cactus





Arkansas

The U.S. state of Arkansas got its name from a word that early

French explorers used for the local Quapaw Indians and the river along which they settled. Arkansas's official nickname is the Natural State, which refers to the state's beautiful countryside of mountains, lakes, and streams. The capital is Little Rock.

Geography

Arkansas is located in the south-central United States. It borders Missouri on the north, Oklahoma and Texas on the west, and Louisiana on the south. On the east the Mississippi River separates Arkansas from Tennessee and Mississippi.

Highlands cover northern and western Arkansas, and lowlands cover the south and east. The Arkansas River divides the highlands into the Ouachita Mountains on the south and the Ozark Mountains (or Ozark Plateau) on the north. The highlands are densely forested. The lowlands are plains with good farmland and



A waterfall tumbles over a rock ledge in the Ozark Mountains in Arkansas.

some hills. Arkansas generally has mild winters and hot, humid summers.

People

About four fifths of Arkansans are of European heritage. African Americans are the largest minority, making up more than 15 percent of the state's population. Almost half of the people live in rural settings. Little Rock is the largest city. It is located in the middle of the state on the south bank of the Arkansas River. The main campus of the University of Arkansas is in the northern city of Fayetteville.

Economy

Leading farm products in Arkansas are poultry (especially broiler chickens), cattle, soybeans, and rice. The processing of farm products is the state's leading manufacturing industry. Many Arkansans are employed as service pro-



A farmer in Arkansas inspects his crop of rice.

viders in such areas as government, retail trade, and health care. Wal-Mart, the largest chain of retail stores in the world, began in Arkansas.

History

What is now Arkansas was originally home to several Native American groups, including the Caddo, the Osage, and the Quapaw. The first Europeans to visit the area were Spaniards. Hernando de Soto arrived in the early 1540s in search of gold. But the French built the first permanent settlement, in 1686.

In 1803 the United States acquired the region from France as part of the Louisiana Purchase. Arkansas became a U.S. territory in 1819 and a state in 1836. In 1861, however, it withdrew from the Union during the American Civil War and joined the Confederacy. It was readmitted to the Union in 1868.

Arkansas remained largely undeveloped and poor for the first half of the 1900s.

During the civil rights movement the state was a focus of national attention. In 1957 Governor Orval Faubus tried to prevent African American students from entering Little Rock's all-white schools. The federal government stepped in and forced the schools to allow racial integration.

The economy of Arkansas began to improve in the late 1950s. The state worked to bring in manufacturing plants, which created new jobs.

One of the most notable people in Arkansas politics was Bill Clinton. After five terms as the state governor, he served as president of the United States from 1993 to 2001.

► More to explore

American Civil War • Civil Rights Movement • Clinton, Bill • Little Rock



African American students walk to school in Little Rock, Arkansas, in 1957. Troops sent by the federal government stand by to make sure the students are allowed to enter the school.

Facts About ARKANSAS

Flag



Population

(2000 census)
2,673,400—
rank, 33rd state;
(2008 estimate)
2,855,390—
rank, 32nd state

Capital

Little Rock

Area

53,179 sq mi
(137,732 sq
km)—rank, 29th
state

Statehood

June 15, 1836

Motto

Regnat Populus
(The People Rule)

State bird

Mockingbird



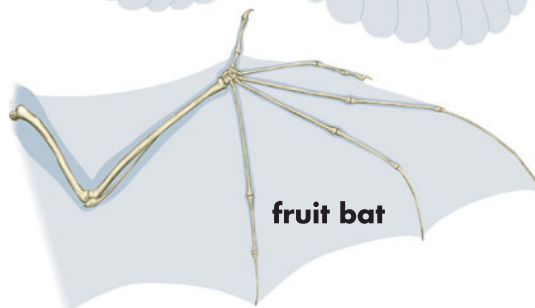
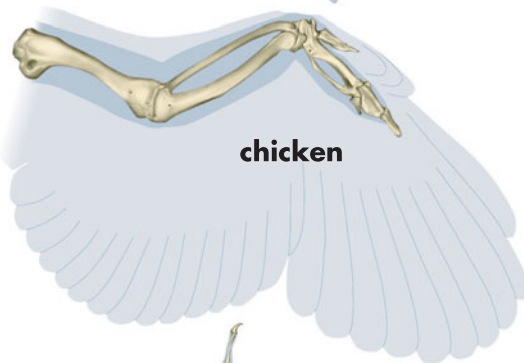
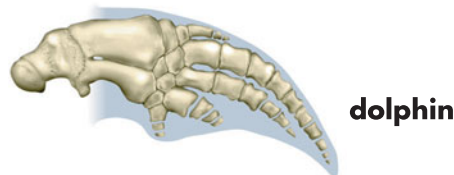
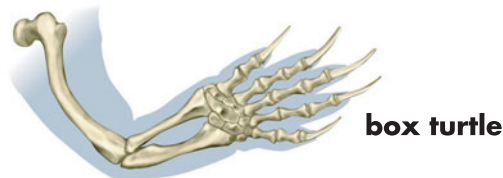
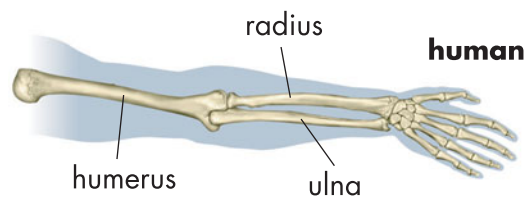
State flower

Apple blossom



Arm

Humans, apes, and monkeys have two upper limbs called arms. Each arm hangs from a shoulder and contains bones, joints, and muscles. These parts work together to give the arm a wide range of movement. The arm can bend, rotate, swing back and forth, and move from side to side.



The human arm is similar to the front limbs of other animals.

Structure

There are three bones in the arm. The upper bone is called the humerus. The top of the humerus fits into a cuplike socket in the shoulder. Together they make a joint that is held together by tough strands called ligaments. This joint allows the upper arm to swing and rotate. A pair of muscles is attached to the humerus. One muscle bends the arm. The other muscle straightens it.

The lower end of the humerus connects to a bone called the ulna at a joint in the elbow. The ulna and another bone, the radius, go from the elbow to the wrist. This part of the arm is called the forearm. A pair of muscles in the forearm makes it twist from side to side. The forearm ends in the hand.

Function

Humans, apes, and monkeys use their arms and hands to push and pull objects, to fight and defend themselves, and to carry their young. Apes and monkeys also use their arms to swing on branches and to move around on the ground.

Arms in Other Animals

Many other animals have two front limbs, but only primates have true arms. The two front limbs of other animals are known as legs, flippers, or wings. Both starfishes and octopuses have limbs that people sometimes call arms. But these arms have no bones or joints. Starfish arms are also called rays, and octopus arms are also called tentacles.

► More to explore

Bone • Hand • Muscle • Primate

Armada, Spanish

The Spanish Armada was a fleet of ships that Spain sent to attack England in 1588. The English defeated the Spanish, which made Spain less powerful in Europe.

The Armada sailed in May 1588 with 130 ships and 27,000 men. They reached the English Channel in late July and fought a few battles. On August 8 the English won a decisive victory. They had fewer ships, but they had big guns and could fire at long range. This was unusual because at the time, sea battles were fought at close range so that soldiers could climb aboard enemy ships.

The defeat of the Spanish Armada saved England from invasion. It also was the first major gun battle at sea. For hundreds of years afterward, gun-armed warships ruled the seas.

► More to explore

England • Spain

Armadillo

Armadillos are small mammals related to sloths and anteaters. They have a tough armor that protects them from enemies and other dangers. The word armadillo is Spanish for “little armored one.”

There are 20 species, or types, of armadillo. They live mainly in or near the tropical (hot) regions of Central and South America. One species lives in the southern United States. Most species live in open areas, but some live in forests.



The nine-banded armadillo is the only kind of armadillo that lives in the United States.

Armadillos are stout with short legs and strong, curved claws. They range in length from about 6 inches (15 centimeters) to 5 feet (1.5 meters). Armadillos are usually brownish black with some yellow markings. Their armor is a type of hardened skin. It is made up of solid plates and flexible bands. It covers most of the body, including the head and usually the tail.

Most armadillos have very little hair. The pink fairy armadillo, however, has a coat of soft, white hair on its underparts and sides.

Armadillos are usually active at night. They live in burrows, or holes that they dig in the ground. Armadillos also dig to find food. They eat mainly termites and other insects, worms, roots, and small animals.

Female armadillos usually bear one to 12 identical young. All develop from a single egg inside the mother.

► More to explore

Anteater • Mammal • Sloth

Did You Know?

Some types of armadillo are able to roll themselves into a ball to protect their underparts from enemies.



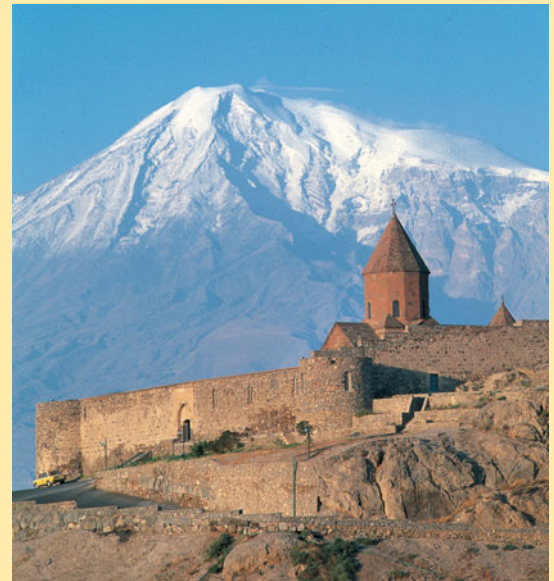
Armenia

The Republic of Armenia is one of the world's oldest centers of civilization. Yerevan, the capital, is also one of the world's oldest cities.

Geography

Armenia is located in western Asia, between the Black Sea and the Caspian Sea. It is bordered by Georgia, Azerbaijan, Iran, and Turkey. Armenia is a mountainous country. The Lesser Caucasus Mountains stretch across the north. Armenia's highest peak, Mount Aragats, is 13,418 feet (4,090 meters) high. The area has experienced many earthquakes, including one in 1988 that killed some 25,000 people.

Armenia has a dry climate. Summers are generally hot. Winters are generally not very cold, except in the mountains and on the windy plateaus.



The Khor Virap monastery is an important religious site for Armenians. It is associated with Gregory the Illuminator. He introduced Christianity to the Armenians more than 1,700 years ago. Behind the monastery rises Mount Ararat, in Turkey.

Plants and Animals

Junipers, dog roses, and honeysuckles grow in the lower areas of Armenia. Thorny bushes cover the mountain slopes. There are beech forests in the northeast and oak forests in the south-east.

Among the animals found in Armenia are wild boars, wildcats, jackals, Syrian bears, lynx, ibex (a kind of wild goat), and mountain sheep.

People

About 98 percent of the people are ethnic Armenians. There are small numbers of Kurds and other groups. Armenian is the official language. Most people are

Christians of the Armenian Apostolic church. Historically, the Armenian church has been independent of both the Roman Catholic and the Eastern Orthodox churches.

Economy

Despite the growth of cities and industries, agriculture is very important to Armenia's economy. Farmers raise potatoes, wheat, tomatoes, barley, grapes, watermelons, sheep, and cattle. Factories make food products, metal products, jewelry, machinery, chemicals, tobacco, and textiles. Mines provide copper. Transportation can be difficult because of the mountains, but Armenia has a network of roads and railways and an airport.

History

Armenian civilization began as early as the 500s BC. It reached its greatest size and influence in the 1st century BC. The Roman Empire conquered Armenia in 30 BC. From the 300s to the 1800s Persians, Byzantines, Arabs, Mongols, Turks, Russians, and others conquered and ruled Armenia at different periods.

During 1895–96 Ottoman Turks killed thousands of Armenians, who wanted independence from the Ottoman Empire. In 1915, at the beginning of World War I, another 600,000 Armenians died of starvation or were killed by Turks. After the war Armenia enjoyed a brief period of independence.

In 1920 the Soviet Union invaded Armenia and forced it to accept a Com-



Schoolchildren walk toward a monument in Yerevan. The monument honors thousands of Armenians who were killed in 1915.

unist government. Two years later the Soviets formed the Transcaucasian Soviet Federated Socialist Republic, which included Armenia, Azerbaijan, and Georgia. The three countries became separate republics within the Soviet Union in 1936.

On September 23, 1991, Armenia declared its independence from the Soviet Union. However, Armenia still relied on economic and military help from Russia.

In the 1990s Armenia fought with neighboring Azerbaijan over control of Nagorno-Karabakh, an area of Azerbaijan with a largely Armenian population. Armenia took control of the region and other Azerbaijani territory in 1993. The continuing conflict hurt Armenia's economy. Many Armenians left the country.

► More to explore

Azerbaijan • Ottoman Empire • Union of Soviet Socialist Republics • Yerevan

Facts About ARMENIA



Population
(2008 estimate)
2,996,000

Area
11,484 sq mi
(29,743 sq km)

Capital
Yerevan

Form of government
Republic

Major cities
Yerevan, Gyumri,
Vanadzor
(Kirovakan)

Armor

When people think of armor, images of a knight covered in clanking metal often come to mind. However, the word armor is used for any kind of clothing that is intended to protect the wearer in combat. As weapons have changed, armor has changed also. An outfit that stops an arrow might not work against a bullet.

Like early clothing, early armor came from animals. Thousands of years ago

warriors cushioned their bodies against the blows of clubs with layers of furry hides. Chinese warriors in the 1000s BC wore armor made of layers of rhinoceros hide.

Later, people learned to use plates made of tough material such as metal, horn, wood, or plastic. Plate armor provided great protection to the body. The ancient Greeks used bronze plates made to fit the body and limbs. The ancient Romans favored plate armor made of iron.

Armor Worn in Europe



500 BC



AD 100



800s



1066



1200s



1300s



1400s



1500s



1600s



Today

Since ancient times warriors have worn armor to protect themselves during battle. Armor has taken many different forms over the centuries.

Plate armor was not very flexible, however, and in the early Middle Ages mail, or chain mail, became the main form of armor. Mail was made of interlinked rings of iron or steel. Mail was flexible and could be worn as a shirt, as leggings, or as a hood.

By the 1300s, plate armor was being made in such a way that the person wearing it could move freely. The armor that protected the knights of Europe during the late Middle Ages was made of large steel or iron plates. This kind of armor replaced mail.

As firearms became more powerful, armor had to get heavier. Eventually armor became too heavy and bulky to be practical. Plate armor disappeared completely in the 1700s.

Some forms of armor continue to be important in modern times. Soldiers wear helmets and other protective clothing. A common form of modern body armor used today is the bulletproof vest. Worn especially by police officers, it often has a lining of overlapping steel disks. Fiberglass and other light artificial materials are sometimes used as well.

Armstrong, Lance

U.S. athlete Lance Armstrong was one of the greatest professional cyclists. He is the only person to have won the Tour de



Lance Armstrong (in yellow) nears the end of the Tour de France bicycle race in 2005.

France—the world's most difficult bicycle race—seven times.

Lance Armstrong was born on September 18, 1971, in Plano, Texas. He was good at sports at an early age. After finishing high school, he devoted himself to cycling. In 1990 he won that sport's U.S. Amateur Championship.

Armstrong began to earn money as a professional cyclist in 1992. The next year he won the world championships in men's road racing and many other competitions.

In 1996 Armstrong was ranked the top male cyclist in the world. But later that year he fell seriously ill with cancer. Surgery and chemical treatments called chemotherapy eventually saved his life.

Doctors doubted that Armstrong could return to a sport as physically demanding as cycling. However, Armstrong won the Tour de France in 1999. He went on to win every Tour de France for the next six years. After his victory in 2005, Arm-

Did You Know?

Lance Armstrong was only the second person from the United States ever to win the Tour de France.

strong retired from professional cycling. He devoted himself to raising awareness about cancer. He returned to racing in 2009 and placed third in the Tour de France that year.

► **More to explore**

Bicycle • Cycling

Armstrong, Louis

U.S. trumpet player and singer Louis Armstrong was one of the world's greatest jazz musicians. He influenced nearly all jazz horn players who came after him.

Louis Daniel Armstrong was born on August 4, 1901, in New Orleans, Louisiana. As a boy he earned some money by singing in the streets. After he fired a pistol one New Year's Eve, he was sent to a home for troubled kids in 1913. There he learned to play cornet.

In 1922 cornetist King Oliver invited Armstrong to Chicago to join his band. Armstrong later joined Fletcher

Henderson's big band in New York City for a year.

Armstrong returned to Chicago and began playing the trumpet. By 1929 he was famous, and he toured the United States and Europe as a trumpet soloist accompanied by big bands. He started performing popular songs in addition to jazz. He also began to sing lyrics in a low, rough voice that was very distinctive.

After 1935 Armstrong appeared in movies and on radio and television. In 1940 he formed Louis Armstrong's All-Stars, a Dixieland band with six musicians. For most of the rest of his life, he toured with this group. He died on July 6, 1971, in New York City.

► **More to explore**

Jazz • Popular Music

Armstrong, Neil

In 1969 U.S. astronaut Neil Armstrong became the first person to walk on the Moon. Millions of people watched on television as Armstrong stepped out of his spacecraft and said, "That's one small step for [a] man, one giant leap for mankind."

Neil Alden Armstrong was born on August 5, 1930, in Wapakoneta, Ohio. He became interested in airplanes at a young age. He received his pilot's license on his 16th birthday. After high school Armstrong became an air cadet in the U.S. Navy. In the 1950s he was a pilot in the Korean War.

Did You Know?

Louis Armstrong's nickname was "Satchmo."



Louis Armstrong



Neil Armstrong

In 1955 Armstrong joined the National Aeronautics and Space Administration (NASA) as a test pilot. Seven years later Armstrong became an astronaut.

On July 16, 1969, Armstrong, Edwin E. (Buzz) Aldrin, Jr., and Michael Collins left for the Moon in the Apollo 11 spacecraft. Four days later, Aldrin and Armstrong landed on the Moon in the Eagle, a landing vehicle that separated from the Apollo spacecraft. Armstrong was the first to step out onto the Moon's surface. For more than two hours he and Aldrin collected samples of Moon soil, made measurements, and took photographs before they began their return trip to Earth.

Armstrong retired from NASA in 1971. He continued to teach and to work on committees about the space program.

► More to explore

Moon • Space Exploration

Army

An army is a large, organized group of soldiers trained to fight other armies or groups. An army's main job is usually to defend its country in times of war. An army protects the country against attacks or invasion by enemies. It may also fight in other parts of the world.

An army is usually one of several major branches of a country's armed forces. In the United States the other major branches are the Air Force and the Navy (which includes the Marine Corps).

Armies Today

Modern armies have ranks, or levels of power. The soldiers who command soldiers in lower ranks are called officers. The officers in the highest ranks are the generals. The generals are in charge of the army as a whole. Beneath the generals are the commissioned officers. They are graduates of special military training schools. Beneath them are the noncommissioned officers. These are men and women who started out as ordinary soldiers and moved up through the ranks. The ordinary soldiers, or privates, make up the lowest ranks of an army.



Soldiers stand in formation at a U.S. Army post in Hawaii.

Sometimes people are drafted, or ordered by their government to join the army. Drafts are common in times of war when too few people volunteer. For example, the United States, Canada, and the United Kingdom had drafts during World War II. Today, however, volunteers make up these countries' armies. Some countries, such as China and Israel, still require most of their citizens to serve time in the army.

History

The first army was probably organized in Sumer, a civilization that began more than 6,000 years ago in the Middle East. The earliest soldiers fought with swords, shields, and bows and arrows. They protected themselves with armor.

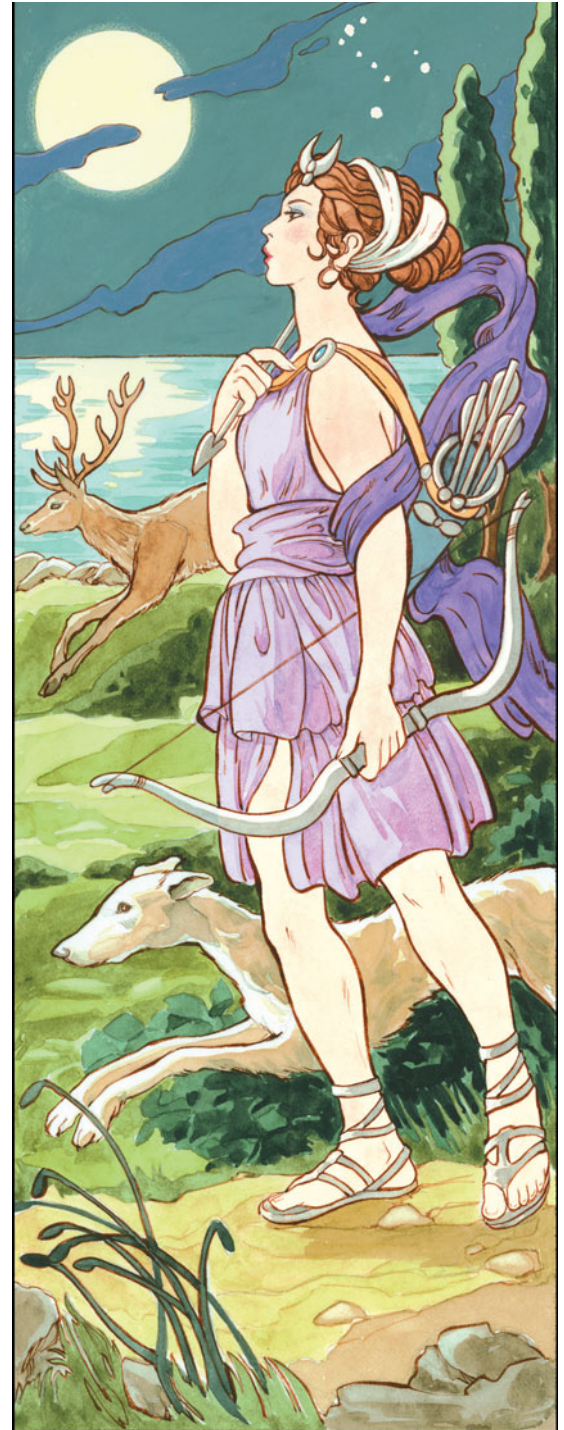
Over the centuries, new developments in warfare changed the way armies fought. Arabs and Europeans invented weapons that used gunpowder in the 1300s. Armies began using machine guns in the 1800s and bombs in the 1900s. Armies continue to develop new weapons. New technology also has helped improve communications and protect soldiers on the battlefield.

► More to explore

Air Force • Armor • Bomb • Marines
• Navy • War

Artemis

In ancient Greek mythology Artemis was the goddess of wild animals and hunting. She was one of the 12 main gods believed to live on Mount Olympus. Artemis was associated with the



Roman goddess Diana because they shared many of the same characteristics. The cypress tree and wild animals were sacred to Artemis.

Artemis was the daughter of Zeus, the chief Greek god, and Leto. Leto was a

Did You Know?

China has the world's largest army.

Titan, or one of the giants who once ruled the world. Artemis was the twin sister of Apollo, the god of music and light. Apollo was associated with the sun, while Artemis was associated with the moon. Some people believed that Artemis helped women during childbirth. Artemis was a protector of animals, but she also hunted them. Artists showed Artemis with a deer or with her hunting dog and silver bow, a weapon used to shoot arrows.

According to one story, Artemis loved the giant huntsman Orion and lived with him in the forest. Eventually, Artemis became jealous. She thought that Orion loved another woman. In revenge, Artemis shot Orion with an arrow. Orion was placed in the sky after his death. There he became a constellation (a group of stars).

► More to explore

Apollo • Greece, Ancient • Mythology
• Zeus

Arthritis

Arthritis is a common medical problem for older people. Sufferers of arthritis experience swelling, pain, and redness in the joints—the places where the bones meet. Arthritis commonly affects the spine, hips, knees, and hands. It may also attack many other parts of the body. In severe cases, people may find it difficult or even impossible to move the joints at all.

Arthritis seems to run in families. People whose parents or grandparents had



Arthritis can bend fingers out of shape.

arthritis often get it themselves. Infections and injuries can cause rarer types of arthritis.

In most cases, arthritis is a lifelong condition without a cure. However, aspirin, ibuprofen, or other drugs may help to relieve the pain and swelling. Exercise may help to increase movement. In some cases doctors may perform surgery. They can remove unhealthy tissue or replace severely damaged joints with ones made of plastic or metal.

► More to explore

Bone • Medicine

Arthur, Chester

When President James A. Garfield was assassinated in 1881, Chester A. Arthur, the vice president, rose to the highest office of the United States. Because many people did not believe that Arthur would make a good president, he worked hard to gain the public's respect.



Chester A. Arthur

Early Life and Career

Chester Alan Arthur was born on October 5, 1829, in the village of Fairfield, Vermont. He was the son of William Arthur, a Baptist minister, and Malvina Stone. Chester entered Union College in Schenectady, New York, when he was only 15. After graduating at age 18, he

studied law while teaching. In 1859 Arthur married Ellen Lewis Herndon. The couple had three children.

Beginning in 1854, Arthur worked as a lawyer in New York City. He became known for his antislavery principles. Arthur won the case of slaves who demanded their freedom after coming to the free state of New York. Arthur also represented an African American woman who had been forced off a streetcar reserved for whites. His success led to a New York law against discrimination in public transportation.

Political Career

In the 1850s Arthur helped to organize the new Republican Party in New York State. In 1868 he worked on Ulysses S. Grant's successful presidential campaign. In 1871 President Grant appointed Arthur customs collector for the port of New York City. In 1880 the Republicans nominated Garfield for president and Arthur for vice president. The Republi-



TIMELINE

Arthur is born in Fairfield, Vermont.

October 5, 1829

Arthur is elected vice president under President James A. Garfield.

1880

Arthur reforms the civil service, the system of government employees.

1883

Arthur dies in New York City.

November 18, 1886

Arthur becomes a lawyer. In his law career he defended the rights of African Americans.

1854

Arthur becomes president after President Garfield dies.

1881

Arthur retires and Grover Cleveland becomes president.

1885

cans won the election, and Arthur took the country's second highest office.

Presidency

On July 2, 1881, a man with a history of mental illness shot President Garfield. Upon Garfield's death in September, Arthur became the country's 21st president. The public considered him unqualified for the post.

However, Arthur surprised everyone by reforming the civil service, the system of government employees. Until that time many politicians gave jobs in the government to friends, party members, and people who paid them money or gave them gifts. In 1883 Arthur signed the first civil-service law, the Pendleton Act, which required that government employees be hired for their skills.

Arthur vetoed, or rejected, a law that would have banned the immigration of Chinese people for 20 years. However, he signed the Chinese Exclusion Act of 1882, which stopped Chinese immigration for 10 years. Arthur also helped to modernize and expand the U.S. Navy.

Arthur's popularity grew with each year of his presidency. In 1884, however, the Republicans nominated James G. Blaine for president. (Blaine lost the election to Grover Cleveland.) Arthur finished his term as president and then returned to New York City. He died at his home on November 18, 1886.

► More to explore

Garfield, James A. • United States

Arthur, King

Arthur was a legendary king of ancient Britain. He appears in a group of stories that are together known as the Arthurian legend. The stories are a combination of history, myth, romance, fairy tale, and religion. They have captured peoples' imagination for many hundreds of years.

Some scholars believe that Arthur was a real person who lived in Britain in the AD 400s or 500s. According to these scholars he led the Christian Celts in wars against Saxon invaders. After Arthur was killed in battle, his people fled to Wales and to Brittany in France. There they told stories of Arthur's bravery and goodness. Eventually he was remembered as a hero and a wise and all-powerful king.



King Arthur's followers were known as the Knights of the Round Table. They used a round table so that each would have an equally important place at the table.

The Legend of Arthur

According to the stories, Arthur was the son of King Uther Pendragon. As an infant, Arthur was given to Merlin the magician. The young Arthur pulled the sword Excalibur from the stone in which it had been magically fixed. This proved that he should be king because no one else had been able to pull the sword from the stone. In another version of the story, the Lady of the Lake handed Arthur the sword, with only her arm visible above the water.

King Arthur married Guinevere and held court at Camelot. He and his strong and brave knights all sat as equals around a great round table. They came to be known as the Order of the Round Table. Sir Lancelot was the greatest of the knights; Sir Galahad, the most noble; and Perceval, the most innocent.

Knights were soldiers who swore loyalty to a lord. The real Arthur, if he existed, lived long before the age of knighthood. Nevertheless, knights and poets of that period depicted him as a knight like themselves.

King Arthur was a mighty warrior. However, his traitorous nephew, Mordred, rose in rebellion. Arthur was badly wounded in battle. His body was carried to the island of Avalon to be healed. At some future time, according to legend, he will return to rule again.

In some stories about Arthur he and his knights sought the Holy Grail. In Christian legend, the Grail is the cup used by Jesus at the Last Supper.

According to legend, only the pure could see the Grail.

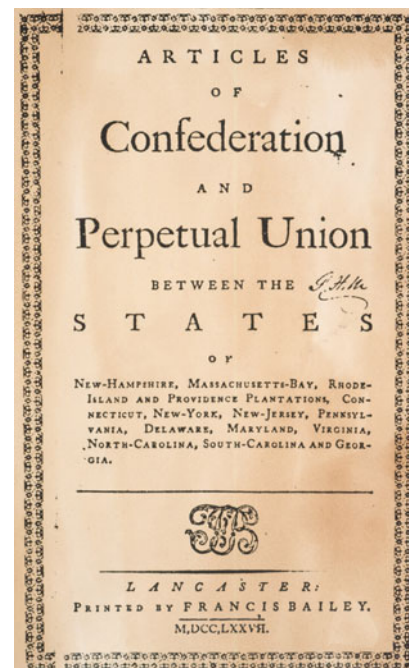
Books about Arthur

Many French and English writers of the Middle Ages wrote down Arthurian legends. Sir Thomas Malory, an English writer of the 1400s, brought together many tales in his book *Le Morte Darthur* ("The Death of Arthur"). Most modern versions are based on Malory's book.

► More to explore

Celt • Folktale • Knight

Articles of Confederation



The Articles of Confederation were printed for everyone to read.

The Articles of Confederation served as the first constitution of the United States. The articles went into effect on

Did You Know?

An English writer named T.H. White wrote four novels about King Arthur and his court. The novels were published in one volume called *The Once and Future King* in 1958.

March 1, 1781. Soon afterward, however, the people realized that there were problems with the document. On March 4, 1789, the articles were replaced by the U.S. Constitution.

The articles were written by the representatives of the American Colonies who made up the Second Continental Congress. When the colonies declared their independence from Great Britain in 1776, they realized they needed a new plan of government. The colonies deeply resented the laws that the British Parliament had imposed on them, so they set up a weak central government. The only branch of government was a Congress with one house. Congress had power over military and foreign affairs but not over the affairs of each state. It could not enforce its powers or collect taxes.

Because of these problems, state leaders wrote a new constitution in 1787. The new constitution strengthened the federal government. It provided for executive and judicial branches and a legislature with two houses.

► More to explore

Continental Congress • United States Constitution

Artificial Intelligence

Intelligence is the ability to learn and to deal with new situations. When a computer or a robot solves a problem or uses language, it may seem to be intelligent. However, this type of intelligence is dif-



Russian chess player Garry Kasparov thinks about a move during a match against a computer. The computer, named Deep Junior, was programmed to play chess.

ferent from human intelligence. It is called artificial intelligence, or AI.

Artificial intelligence comes from sets of instructions that people write. These instructions are called programs. Computers use programs to analyze, or study, large amounts of information quickly. Then they pick answers or actions from among many choices. Computer programs can be used for playing games, making medical decisions, and translating languages.

But analyzing information is not the same as understanding a problem as humans do. Computers can only use logic, or the relationships among facts, to figure out problems. Humans use many skills besides logic when making decisions. They use such things as imagination, awareness, emotion, and values. No one knows yet whether these abilities can be programmed into a computer.

► More to explore

Computer • Robot

Arts

Before the 1700s the word art was often used to describe any skill that produced something. At the time both painting and farming were thought of as arts. Today people think of the arts more as forms of expression. An artist uses skill and imagination to create a product. This product often draws a response from others. These responses can include admiration of a beautiful sculpture, feelings of sadness from a moving poem, or pleasure from a funny play.

Individual arts are often grouped into categories based on similarities. Theater, dance, and music are examples of performing arts. Poetry, short stories, and novels are literature—words crafted to express ideas. Painting, drawing, sculpture, and photography are examples of visual art, or art that is enjoyed through sight. Some arts, such as architecture (the design of buildings) and motion pictures (movies), are harder to classify.



Several different types of art are on display in the Hermitage museum in Saint Petersburg, Russia.

An art form may include combinations of several other forms. For instance, an opera brings together a dramatic plot, music that is both played and sung, scenery and costumes, acting, and perhaps dance.

Art forms that result in “useful” products are sometimes called decorative arts or crafts. Furniture design, metalworking, basketry, and pottery are a few examples of decorative arts.

► More to explore

Architecture • Dance • Decorative Arts
• Drawing • Literature • Movie • Music
• Opera • Painting • Photography
• Poetry • Pottery • Sculpture • Theater

Arts, Decorative

► see Decorative Arts.

Asante

► see Ashanti.

Ash

Several types of ash tree are valued for their hardwood or their beauty. There are about 70 different species, or types, of ash tree. They are members of the same scientific family as olive trees, jasmines, and lilacs.

Most ash trees grow in the northern half of the world. They grow best where it is neither extremely hot nor cold. They usually need plenty of sunshine.



The spreading branches of an ash tree give the tree a rounded shape.

Some ashes are considered shrubs, but most are trees. Ash trees are typically small to medium in height. However, some types may grow taller than 100 feet (30 meters). Most ashes have a strong, straight trunk with gray bark. The spreading branches usually form a rounded shape. The green leaves are made up of several parts called leaflets. In autumn the leaves of most ashes turn yellow or purple before they are shed for the winter. The flowers are usually small and grow in clusters. Each seed has a papery wing shaped like a dragonfly wing.

Several kinds of ash tree have strong, tough wood. These hardwood ashes include the white, green, black, blue, and Oregon types in North America and the European type in Europe. Their wood is used to make such products as baseball bats, hockey sticks, tennis rackets, oars, furniture, tool handles, and barrels. Ash trees are also

often planted in cities to provide shade and color.

► More to explore

Olive • Tree

Ashanti

The Ashanti, or Asante, people formed a powerful West African kingdom in the 1700s and 1800s. The kingdom grew wealthy from the slave trade and conquered many peoples. In 1874, however, the kingdom became a colony of Great Britain. The Ashanti territory is now part of the country of Ghana.

The rise of the Ashanti began in the 1670s, when Ashanti ruler Osei Tutu crushed all opponents in the region. He then declared himself Asantehene, or king. The next ruler, Opoku Ware, continued the Ashanti's conquests. During his reign, from 1720 to 1750, the empire reached its peak.



An Ashanti chief wears fine clothing and gold jewelry.



Throughout the 1700s, the Ashanti supplied captives to British and Dutch slave traders on the coast. In return, the Europeans provided the Ashanti with fire-arms that they used to make more conquests. Great Britain outlawed the slave trade in 1807. After that, the Ashanti had to rely more heavily on other trade items, such as gold, ivory, and cocoa.

Serious trouble came when Britain expanded its own empire inland. In 1874 British forces captured Kumasi, the capital of the Ashanti. The Ashanti soon lost their hold over the groups they had ruled over. In 1902 Ashanti lands were made part of a British colony called the Gold Coast. In 1957 the Gold Coast became the independent country of Ghana.

The Ashanti people still live in a region centered on Kumasi. Kumasi is a busy and prosperous city. But most Ashanti

live in villages. They are mainly farmers who produce plantains, bananas, cassava, yams, and cacao.

► More to explore

Ghana • Slavery

Ashe, Arthur

Tennis champion Arthur Ashe was an African American who triumphed in a traditionally white sport. He was ranked among the top 10 players in the world for 12 years.

Arthur Robert Ashe, Jr., was born in Richmond, Virginia, on July 10, 1943. He started playing tennis as a child. Between 1955 and 1963, Arthur won 11 national youth championships. At the same time, he worked hard in school. He won a scholarship to attend the University of California at Los Angeles (UCLA).



Arthur Ashe returns a ball during the U.S. National Championships in 1965.

In 1968 Ashe won the U.S. Open tournament. The tournament is one of the four major events in tennis each year. The others are Wimbledon (in England), the French Open, and the Australian Open. Ashe's win was the first ever for an African American man in one of these tournaments. Afterward, he regularly reached the semifinals and finals of the tournaments. Ashe won the Australian Open in 1970. In 1975 he won the top prize at Wimbledon.

Ashe retired after suffering a heart attack in 1979. In 1983 he had another heart attack and required surgery. It is thought that blood that he received at this time was infected with HIV. HIV is the virus that causes the disease AIDS. As a result he contracted the disease. However, he continued to display the same determination he showed on the tennis court. He took the side of refugees, underprivileged children, and people with AIDS. He died of AIDS on February 6, 1993.

► More to explore

AIDS • Tennis

Ashgabat



Population
(2007 estimate)
744,000

Ashgabat is the capital of the central Asian country of Turkmenistan. The city lies at the foot of a mountain range. It is



A statue of a horseman stands in front of a monument in downtown Ashgabat.

also at the edge of a desert, in an area called an oasis. An oasis is a part of a desert that has enough water for people to live.

Ashgabat is one of Turkmenistan's centers of industry and transportation. The city is famous for its carpet-weaving industry. It also has glassworks, cotton mills, and metalworking shops.

The city was founded in 1881 as a Russian military fort. It was called Ashkhabad. During much of the 1900s it was the capital of a republic of the Soviet Union. An earthquake destroyed much of the city in 1948, but it was rebuilt. In 1992 Turkmenistan became an independent country with Ashkhabad as the capital. The city then adopted the Turkmen version of its name—Ashgabat.

► More to explore

Oasis • Turkmenistan

Asia

The largest and most populated continent is Asia. It has nearly one third of the world's total land area and is home to more than half Earth's people.

Land and Climate

Because Asia is so vast and varied, it is often discussed in terms of six general regions: Southwest, South, Southeast, East, North, and Central Asia. Southwest Asia consists mainly of countries on or near the Arabian Peninsula, such as Saudi Arabia, Iran, Iraq, and Israel. Most of Turkey is also included in this group. (Some of Turkey is considered part of Europe.) The countries of Southwest Asia are also part of a region known as the Middle East. Much of the land in Southwest Asia is desert.

The main geographic features of South, Southeast, and East Asia are great mountains, high plains, and islands. India and Pakistan are major countries in South Asia; Indonesia, Malaysia, Thailand, the Philippines, and Vietnam are in Southeast Asia; and China, Japan, and North and South Korea are in East Asia.

Northern Asia, also called Siberia, is part of Russia. (Russia's Ural Mountains separate Asia and Europe, so Russia is partly in Asia and partly in Europe.) Siberia has mostly frozen plains and swampy forest. Because of the extreme cold, few people live there. Most of Central Asia consists of desert, but in the north are vast grasslands.







The Tian Shan Mountains are a major feature of Central Asia.

The continent's largest deserts are the Gobi and the Takla Makan Desert in East Asia and the Thar Desert in South Asia. Many of the world's highest peaks are found in the Himalayas of South Asia. The continent's other major mountain ranges include the Hindu Kush, the Tian Shan, and the Altai, all in Central Asia. Major Asian rivers include the Yangtze and Huang He in China; the Mekong and Irrawaddy in Southeast Asia; the Ganges in India; and the Ob in Russia. Some of the world's earliest civilizations developed along the Indus River in India and the Tigris and Euphrates rivers in Southwest Asia.

The climate of Asia varies greatly. The continent has some of the hottest and

coldest places on Earth, as well as many areas in between. Cherrapunji, India, is one of the world's wettest places, averaging nearly 400 inches (1,000 centimeters) of rain per year. Southwest Asia has some of the world's driest deserts. South and Southeast Asia are hot, wet regions with two distinctive seasons: a relatively cool and dry winter and a rainy and hot summer.

Plants and Animals

Because of the wide variety of climates and physical features, there are many types of plants. In northern Siberia lichens, mosses, and some wildflowers grow. To the south are evergreen forests and grasslands. China has the most varied vegetation of any country in the world. Palm trees and bamboo grow in the southern parts of China, South Korea, and Japan. In South and Southeast Asia rain forest is the main natural vegetation, though large areas of trees have been cut down to make room for farming. In the mountains of Southwest Asia there are forests of beech trees, evergreens, hollies, and creepers.

Asia's animals are as varied as its plants. Northern Asia has polar bears, walrus, moose, and reindeer, while wild camels roam the Gobi. Asia's reptiles include crocodiles, king cobras, and Komodo dragons. Animals found only in Asia include the orangutan, giant panda, Asian elephant, Siberian tiger, Bengal tiger, and Indian rhinoceros. However, the population of many animals in Asia has been reduced because of the destruction of animal habitats and uncontrolled hunting.

People

Many different groups of people live in Asia. Arabs, Jews, Iranians, and Turks are among the peoples of Southwest Asia. South Asia is home to Indian peoples. Southeast Asia's wide variety of peoples and cultures has been influenced by India and China. The main peoples in East Asia are the Chinese, Japanese, and Koreans. Northern Asia includes various Asian groups, as well as Russians and other Europeans.

Hundreds of different languages can be heard throughout the continent. More than 250 languages are spoken in Indonesia alone. Some of the most widely used languages in Asia include Arabic, which is spoken in parts of Southwest Asia; Hindi, spoken in India; and Chinese (Mandarin), spoken in China. Russian, English, and French are also spoken.

The world's major religions—Buddhism, Hinduism, Islam, Judaism, and Christianity—all started in Asia. Today, many people in Southeast and East Asia follow Buddhism. Hinduism is the main religion in India and Nepal, while Islam is practiced in much of Southwest Asia and in Indonesia, Malaysia, Pakistan, and Bangladesh. Judaism is the main religion in Israel. Christianity is practiced throughout the continent, but only in the Philippines, Russia, and Armenia is it the main religion.

Hong Kong, Israel, Japan, Singapore, and South Korea have excellent education and health care systems. But

most of the rest of Asia is still developing. The living standards of many people are behind those in the Western world. In general, problems with nutrition are common. Health and education services are limited and are generally more available in cities than in rural areas.

Economy

Agriculture is an important part of the economy in many Asian countries. In much of Asia the main food crop is rice. Wheat is important in parts of Northern, Central, Southwest, and South Asia. Crops grown for sale include tea, sugarcane, coconuts, and rubber. Sheep and goats are raised for meat and wool in most of Asia. China, Japan, Indonesia, India, and Russia catch large amounts of fish.

Asia has large reserves of almost every important mineral. The continent has more than half the world's reserves of



The religion of Buddhism was founded in India and soon spread throughout Asia. The Kiyomizu Temple is one of the most famous Buddhist temples in Japan.



A fisherman casts his net into the Mekong River in Southeast Asia.

coal, mostly in China, Siberia, and India. Major deposits of oil are found in Saudi Arabia, Iran, Iraq, the United Arab Emirates, and Qatar. Asia also produces large amounts of iron ore, cast iron, tin, tungsten, and refined zinc.

Asia's industrialized areas, including Japan, South Korea, Taiwan, and Singapore, make a wide variety of products. China and parts of South and Southeast Asia began developing their manufacturing in the late 20th century. South and Southeast Asia produce traditional goods such as textiles as well as technology products such as computers. Oil and gas are processed in Southwest and Central Asia.

History

Asia was home to three of the world's first civilizations, which developed written languages and built large cities. The first such society developed in Southwest Asia in a region called Mesopotamia in about 3500–3000 BC. A civilization developed in the Indus River valley in what is now Pakistan by

about 2500 BC. Historians believe that Chinese civilization began in about 2500 BC as well.

Over time these civilizations changed as they were taken over by other groups. The Mesopotamian kingdoms became part of the Greek and Persian worlds. In the AD 600s Islam was founded in Arabia. Arab Muslims took over Mesopotamia and then moved into other parts of Asia.

The Indus Valley civilization died out in about 1700 BC. At about this same time, a people known as Aryans invaded what is now India. Their religion eventually evolved into Hinduism. The Mauryan Empire united South Asia in about 300 BC, though others eventually took over from them. In the late AD 1100s Muslim rulers took over part of the region.

Chinese culture dominated East Asia. China was ruled by a series of dynasties for thousands of years, from about the 1700s BC to the AD 1900s. The Mongols, a people from Northern and Central Asia, ruled much of Asia during the AD 1200s and 1300s.

To take control of Asia's vast wealth, Europeans conquered many Asian countries and made them into colonies in the 1800s. By the end of World War II, the colonies began to seek independence. India became free of British rule in 1947. France fought to keep control of its colonies in Southeast Asia but finally withdrew from the region in 1954. Most

Central Asian countries were part of the Russian Empire and later the Soviet Union. They became independent after the breakup of the Soviet Union in 1991.

China also underwent major changes. In 1912 the last dynasty came to an end, and the country became a republic. China's government became Communist after Communists won a civil war in 1949.

Communists in Korea and Vietnam also fought for control of those countries. The Korean War, from 1950 to 1953, resulted in the separation of Korea into two countries: North Korea and South Korea. North Korea had a Communist government, but South Korea did not. The Vietnam War ended in 1975 with Vietnam united under a Communist government.

In 1948 the country of Israel was created in the Middle East as a homeland for the Jewish people. Arab countries opposed the creation of Israel, however, and they and the Israelis fought a series of wars. Southwest Asia was the site of several other conflicts, including the Iran-Iraq War (1980–88), the Persian Gulf War (1991), and a U.S.-led invasion of Iraq (2003).

In the last half of the 1900s, many Asian countries had to deal with problems left over from the period of European rule. The boundaries of the European colonies did not always match the natural divisions of peoples, cultures, and physical regions. When

Facts About ASIA	
Area	17,291,121 sq mi (44,783,797 sq km)
Population (2008 estimate)	4,056,802,260
Largest Country by Area	Asian portion of Russia: 5,051,400 sq mi (13,083,065 sq km)
Smallest Country by Area	Maldives: 115 sq mi (298 sq km)
Largest Country by Population	China (2008 estimate) 1,324,681,000
Smallest Country by Population	Maldives (2008 estimate) 386,000
Largest Cities	Beijing, China; Mumbai (Bombay), India; Seoul, South Korea; Delhi, India; Tokyo, Japan
Longest River	Yangtze River, China: 3,915 mi (6,300 km)
Largest Lake	Caspian Sea (Asia/Europe): 143,000 sq mi (370,000 sq km)

the colonies gained independence they kept those boundaries, but there were often tensions between the people who had been forced to live together. At the same time, however, many Asian countries worked hard to improve their economies.

► More to explore

Arabian Peninsula • Buddhism
• Christianity • Himalayas • Hinduism
• Indus Valley Civilization • Islam
• Judaism • Mesopotamia • Middle East
• Mongol Empire • Persia • Union of
Soviet Socialist Republics

Asia Minor



Asia Minor is the place where the continents of Asia and Europe meet. It is also known by its Greek name, Anatolia. In the past Asia Minor was a meeting point for travelers passing between Asia and Europe. Today it is part of the country of Turkey.

Asia Minor is a peninsula, or a piece of land surrounded by water on three sides. The Black Sea lies to the north. The Aegean Sea lies to the west. The Mediterranean Sea is to the south. The peninsula extends westward from Asia toward Europe.

► More to explore

Asia • Europe • Turkey

Asian Americans

Asian Americans are people in the United States whose ancestors came from Asia. Many Asian Americans were born in Asia and later moved, or immigrated, to the United States. However, many other Asian Americans were born

in the United States. Their families often have been in the country for several generations.

Asian Americans have roots in many different countries. The largest groups of Asian Americans have ancestors from China, the Philippines, India, Vietnam, Korea, or Japan. Many other Asian Americans have ancestors from Cambodia, Laos, Pakistan, or Thailand. Smaller groups of Asian Americans have roots in many other Asian countries. (A tiny group has roots in the part of Asia called the Middle East. However, many of these people are better known as Arab Americans.)

Early Asian Immigrants

Asians did not start immigrating to the United States until the 1800s. Workers from China began arriving in the United States in about 1820. A gold rush in California in the mid-1800s brought many more Chinese people to the West Coast. In the 1860s about 15,000 Chinese workers helped to build the transcontinental (cross-country) railroad. Almost all the early Chinese immigrants were young men. Many came to earn money but planned to return to China. Others decided to stay.

Meanwhile, in the 1850s and 1860s, people from China and Japan began arriving in Hawaii. They came mainly to work on sugar plantations, or large farms. Thousands more Japanese arrived in Hawaii during the 1880s. In the early 1900s workers from Korea and the Philippines also came to work on Hawaii's plantations.

Did You Know?

People called the Hittites lived in Asia Minor from about 1700 to 1180 BC. After that many different groups ruled the area. It became part of the Republic of Turkey in 1923.



Chinese New Year festivities attract crowds to the neighborhood called Chinatown in Chicago, Illinois.

During the late 1800s and early 1900s, many immigrants from Japan, Korea, and the Philippines settled on the West Coast. Smaller numbers came from India. Many Asian immigrants worked on farms in California.

Discrimination

Asian immigrants often faced discrimination, or unfair treatment, from whites. In addition, the U.S. government did not allow them to become U.S. citizens. This meant that Asian immigrants did not have the same rights as immigrants from Europe.

Eventually, the government passed laws to stop Asians from immigrating to the United States. In 1882 the U.S. Congress passed the Chinese Exclusion Act. This law stopped Chinese people from immigrating to the United States. The Immigration Act of 1924 stopped all immigration from Asia.

Despite this discrimination, many Asian Americans started families, set up busi-

nesses, and built communities in the United States. Their children, born in the United States, became U.S. citizens. Many Asian Americans served in the U.S. military.

Japanese Internment

In 1941 Japan bombed the U.S. military base at Pearl Harbor in Hawaii. The United States then joined World War II. During the war, the U.S. government saw all Japanese Americans as possible



A Japanese American family has their bags packed for their move to an internment camp.

enemies. It distrusted even those who had been born in the United States and were citizens.

The government forced Japanese Americans on the West Coast to move to special camps, called internment camps. These Japanese Americans lived in the camps until the war ended in 1945. They lost their jobs and often their land, homes, and businesses. Even so, thousands of Japanese Americans—and other Asian Americans—served in the U.S. military during the war.

Did You Know?

Norman Y. Mineta was the first Asian American to head a U.S. government department. He served as Secretary of Commerce and later as Secretary of Transportation.

In 1989 Congress apologized to Japanese Americans for their treatment during World War II. The government also gave 20,000 dollars to each surviving internee.

New Laws and New Immigrants

Following World War II Congress passed laws that led to fairer treatment of Asian Americans. A law called The Immigration and Nationality Act of 1952 gave all Asian immigrants the right to become U.S. citizens. The Immigration Act of 1965 allowed people from any Asian country to immigrate to the United States.

After 1965, many new Asian immigrants came to the United States. Many came from Korea and countries in Southeast Asia, especially Vietnam. These immigrants often were escaping wars in their homelands. But Asian immigrants also came to find work. For example, great numbers of Indians came to work in the



Asian American architect and artist Maya Lin stands beside one of her works. Lin is famous for designing the Vietnam War Memorial in Washington, D.C.

United States as doctors, scientists, engineers, or computer specialists.

Asian Americans Today

By 2000 there were more than 10 million Asian Americans in the United States. They made up about 4 percent of the U.S. population. About half of them lived in the West, especially in Hawaii and California. In the East, New York had the highest number of Asian Americans. More than 65 percent of the Asian Americans in 2000 were U.S. citizens.

Some Asian Americans today feel that other Americans still treat them as outsiders. Nevertheless, many Asian Americans have achieved high levels of economic and educational success. Asian Americans continue to be an important part of U.S. society, as they have been for more than 150 years.

► More to explore

Asia • California • Citizenship
• Discrimination • Hawaii • Migration,
Human • United States

Asmara



Population
(2002 estimate)
500,600

Asmara is the capital of the East African country of Eritrea. It is also the country's largest city. Located in a highlands region, Asmara is more than 7,500 feet (2,300 meters) above sea level.

Asmara is a major market for farm products. It is also a center for tanning hides. Factories in the city make textiles, footwear, and soft drinks. Roads, railroads, and airplane routes connect Asmara to a port on the Red Sea.

Asmara was once a small village of the Tigre people. In 1900 it became the capital of the Italian colony of Eritrea. In 1935 Italy invaded Ethiopia. The Italians made Asmara the main base for the attack. Afterward Asmara was the leading city in the territory called Italian East Africa. Later the British and then the Ethiopians controlled Eritrea. In 1993 Eritrea won its independence, and Asmara became its capital.

► More to explore

Eritrea

Asparagus

People have been eating asparagus as a vegetable since ancient times. The veg-



Tender asparagus spears shoot up from the ground in spring and early summer.

etable is also called garden asparagus. This helps to separate it from the hundreds of other types of asparagus plants. All asparagus plants belong to the lily family, along with onions and garlic.

Asparagus grows wild in parts of Europe, Africa, and Asia. Farmers and gardeners grow the vegetable in areas where the winters are cool or cold. The world's leading asparagus producers are China, Peru, and the United States.

People eat the young shoots of the asparagus plant, which are called spears. The spears shoot up from the roots during the spring and early summer. They must be picked by hand, not by machine. That makes asparagus an expensive crop to grow.

The spears of the asparagus plant are normally green. That is because they contain chlorophyll, the substance that uses light energy to make food for plants. Some growers in France and other places bury the growing spears in

soil. This shields them from the sun and prevents them from making chlorophyll. Spears grown this way are white. White asparagus is known for its delicate flavor.

People usually eat asparagus spears cooked. They are often served hot with melted butter or a rich sauce. The spears are also eaten cold in salads.

► More to explore

Garden • Lily • Plant

Aspen

The trees called aspens are known for their fluttering leaves. Their leaf stalks are long, weak, and flattened. They allow the leaves to move in even the slightest breeze.

Aspens belong to the group of trees called poplars. The poplars are closely related to willow trees. There are three species, or types, of aspen. The European aspen grows in Europe, northern Africa, and Asia. The quaking, or trembling, aspen and the big-tooth aspen are found in North America.



The quaking aspen grows in more areas of North America than any other kind of tree.

The bark of aspens is usually smooth and greenish gray or white. Aspen leaves are rich green. In autumn the leaves turn bright yellow before they fall off the tree. The European aspen and the quaking aspen can reach a height of 90 feet (27 meters). The big-tooth aspen can grow to about 59 feet (18 meters).

Aspens can reproduce both by producing seeds and by growing new sprouts. A single aspen can produce more than 50 million seeds each season. Aspens also grow sprouts from their own roots. These sprouts grow into new trees. Root reproduction makes it hard to get rid of aspens. If people cut down a batch of aspens, new aspen sprouts will shoot up if the roots still exist.

People use aspens to make paper. They also value aspens for their shade and beauty.

► More to explore

Poplar • Tree • Willow

Assassination

The murder of a public figure is called assassination. Many world leaders have been killed in this way, mostly for political reasons. In the 1900s ordinary citizens and military personnel also became targets of assassins.

Assassination is an ancient crime. The Roman ruler Julius Caesar was killed on March 15, 44 BC, by political enemies. However, the word assassin was not used until the Middle Ages. It comes from a word that means “hashish smokers” and



Both Indira Gandhi and her son Rajiv served as prime ministers of India. Indira Gandhi was assassinated in 1984. Rajiv Gandhi became prime minister after her assassination. Later he was also killed.

refers to an Islamic group that existed between the 1000s and the 1200s. According to legend, the members of this group were given the drug hashish to make them into fearless killers of their religious rivals.

Assassins strike for various reasons. Some feel that they were mistreated in some way. For example, U.S. president James A. Garfield was killed in 1881 by a man who was angry that he did not get a political job. Others disagree with the victim's beliefs or with a public stand that the victim has taken on a particular issue. The Egyptian leader Anwar el-Sadat was assassinated by people who were angry with him for signing a peace treaty with Israel. The U.S. civil rights leader Martin Luther King, Jr., was killed by a man who disagreed with the cause of civil rights.

Still other assassins want to call attention to a cause or make a political statement. U.S. president William McKinley died

after being shot on September 6, 1901. His killer was an anarchist—a person who wanted to do away with governments. Anarchists also killed several heads of state in Europe in the early 1900s. Some hoped to change the course of history.

One particular assassination had far-reaching effects. The assassination of Archduke Francis Ferdinand of Austria-Hungary in 1914 helped to bring about World War I.

► More to explore

Caesar, Julius • Garfield, James A. • King, Martin Luther, Jr. • McKinley, William • Sadat, Anwar el- • World War I

Assiniboin

The Assiniboin (or Assiniboine) tribe of Native North Americans were originally



An Assiniboin chief wears the traditional clothing of his tribe.

Did You Know?

The Assiniboin were friendly with the Cree. Their enemies were the Blackfoot and the Dakota Sioux.

part of the Yanktonai Dakota (Sioux) people. In the 1600s, they split from the Yanktonai and moved west into what are now the states of Montana and North Dakota and the Canadian provinces of Saskatchewan and Manitoba.

The Assiniboin's name came from an Ojibwa Indian word meaning "one who cooks with stones." This was because they used stones heated in a fire to boil cooking water.

The Assiniboin spent much of their time hunting bison (buffalo). Bison meat was their main source of food, and they used bison hides to make their clothing and shelter.

By the late 1600s, the French and the English began building trading posts near the Assiniboin's territory. The Europeans brought with them diseases such as measles and smallpox, which killed many members of the tribe.

Weakened by disease and warfare, in 1851 the Assiniboin agreed to give up much of their traditional territory to the U.S. government in exchange for reservation lands. The Assiniboin in the United States eventually settled on two reservations in Montana. Those in Canada moved to several reserves in Alberta and Saskatchewan. By the end of the 20th century, there were about 5,000 Assiniboin living in the United States and about 3,000 in Canada.

► More to explore

Native Americans

Astana



Population
(2006 estimate)
550,440

Astana is the capital of the central Asian country of Kazakhstan. The city lies along the Ishim River.

Astana is a railway hub. Many of its people work for the railroads. The city also has factories that finish metals, process foods, and make farm machinery.

The city was founded in 1824 as a Russian military outpost. It was originally called Akmolinsk. It has had several names over the years. For many years it was the capital of a province in the Soviet Union. Kazakhstan became an independent country in 1991. The city became its capital in 1997. The next year the city's name was changed from Akmola to Astana.

► More to explore

Kazakhstan

Asteroid

Asteroids are small, rocky bodies that orbit, or travel around, the sun. They are also called minor planets or planetoids. In general, they are materials left over from when the planets formed. They are also created



The asteroid called Gaspra is about 12 miles (20 kilometers) long.

when other bodies in space collide and break apart. Most asteroids travel around the sun in a loose path that falls between the orbits of the planets Mars and Jupiter. Astronomers identified the first asteroids in 1801.

Asteroids are much smaller than planets. The largest asteroids are between 62 miles (100 kilometers) and 620 miles (1,000 kilometers) across. Millions of asteroids are the size of large boulders. Asteroids can be almost any shape. Some are nearly round while others are irregularly shaped chunks. Asteroids are made up of stone and metal.

Many small asteroids enter Earth's atmosphere each day. Almost all burn up before they hit the ground. As they burn they create a streak of light called a meteor. An asteroid that survives the fall through the atmosphere and reaches Earth's surface is called a meteorite.

► More to explore

Planets

Asthma

Asthma is a long-term medical condition that affects a person's lungs. From time to time people with asthma suffer attacks, or episodes of sickness, in which they find it difficult to breathe. People can get asthma at any age. It is one of the most common long-term health problems in children. Asthma in children usually begins by the age of 5.

Symptoms

The symptoms, or signs, of an asthma attack include coughing and the feeling of not getting enough air. Wheezing, or breathing that makes a whistling sound, is also common. Asthma attacks usually last from about 30 minutes to several hours. The symptoms can range from mild to serious. In rare cases an asthma attack can lead to death.



A child uses an inhaler. An inhaler is a device that quickly delivers medicine to the lungs of a person with asthma.

Causes

An asthma attack results from changes in the small tubes in the lungs that carry air. During an attack the muscles around these airways tighten. This makes it harder for air to pass through. The tubes also swell up. This leaves less space inside for the airflow. In addition, the tubes fill up with extra amounts of a thick fluid called mucus.

Scientists do not know exactly why people get asthma. But once people have the condition, their bodies tend to overreact to certain things called triggers. The triggers vary from person to person. For some it may be exercising. For others, breathing polluted air or getting a cold may bring on an asthma attack. Sudden weather changes can cause attacks, too.

Asthma attacks are also often associated with allergies. Allergies are a body's negative reactions to certain substances. Things that cause allergic reactions may trigger asthma attacks, too. These things include plant pollen, mold, and tiny insects that live in house dust.

Treatment

There is no cure for asthma. However, several medications can help prevent asthma attacks. Other medicines can quickly relieve the symptoms of an attack. People with asthma also try to avoid the things that trigger their attacks.

► More to explore

Allergy • Lung • Medicine

Astronomy

Astronomy is one of the oldest sciences in the world. The study of astronomy involves all of the objects outside Earth's atmosphere. These include the sun, Moon, planets, stars, galaxies, and all other matter in the universe. People known as astronomers have studied these objects for thousands of years.

Study of Astronomy

Astronomers study the universe in different ways. Some are professionals, meaning that they make their living at the work. Others study objects in space as a hobby. They are known as amateur astronomers.

Some astronomers work in laboratories. There they study actual samples of objects that have been collected by spacecraft. These include meteorites,



An astronomer points a telescope toward the evening sky.



Astronomers study everything they can see or detect in the sky. Some astronomers study the oddly shaped clouds of gas and dust called nebulae.

rock samples from the Moon, and dust particles.

Many astronomers observe distant objects with the help of telescopes. Telescopes range in size. Some are small enough to be carried by hand. Large telescopes are often housed in buildings known as observatories. The Hubble Space Telescope is in orbit around Earth as a floating observatory. The Hubble magnifies and records images of distant space objects. It then sends the information to astronomers on Earth.

Astronomers also use cameras and other instruments to record information about

distant objects. Photographs provide astronomers with a visual record of their observations. Other instruments can help reveal faint, hard-to-detect objects in outer space. These instruments measure the light and other radiation coming from the objects.

Some Early Astronomers

Thousands of years ago there were no calendars or clocks. People kept track of time by watching the sun and the stars. It was important for them to know the time in order to sow their crops and reap their harvests. These people were the first astronomers.

The most influential ancient astronomer was Ptolemy of Alexandria in Egypt. He lived in the AD 100s. He developed the idea that Earth occupies the center of the universe. He thought that the other objects revolved around Earth. Most people believed this idea of Ptolemy's for more than a thousand years.

In 1543 Nicolaus Copernicus published a revolutionary new theory. He believed that Earth and the other planets revolve around the sun. Copernicus was criticized because he challenged Ptolemy's theory. Galileo Galilei, a great Italian scientist and astronomer, supported Copernicus' theory with his observations.

Later astronomers made new discoveries that also supported Copernicus' idea. In the early 1600s Johannes Kepler explained how the planets travel around the sun. In 1687 Isaac Newton learned about gravitation and motion. His work reinforced Kepler's laws. Today astrono-

Did You Know?

Chinese astronomers noticed an explosion in the sky on July 4, 1054. This was a supernova, or the explosion of a star. Its remains can be seen today in the Crab Nebula.

mers know that Copernicus was correct. But there are still many questions about the universe. Astronomers continue to try to answer those questions.

► More to explore

Solar System • Telescope • Universe

Asunción



Population

(2006 estimate), city, 519,361; (2007 estimate), urban area, 1,870,000

Asunción is the capital of Paraguay, a country in South America. It is Paraguay's largest city. Asunción is located on the Paraguay River. From the city's port, ships can travel to the Atlantic Ocean.

Asunción processes and ships much of the food grown throughout Paraguay. Factories in the city also process cotton and make cloth, shoes, and tobacco products. The government employs many people in Asunción. Others work in service industries such as health care, tourism, and trade.

The Guaraní Indians moved into the area hundreds of years ago. In the 1500s people from Spain settled among the Guaraní and created a colony. The Spanish named the city Asunción in 1537. Paraguay became independent from



The presidential palace in Asunción is brightly lit at night.

Spain in 1811. Asunción then became Paraguay's capital. During a war in the late 1800s Brazil took control of Asunción. But the city was returned to Paraguay about 10 years later.

► More to explore

Paraguay

Athapaskan

The Athapaskan (or Athabascan) were a large group of Native American tribes who spoke similar languages. They traditionally lived in northwestern North



An Athapaskan child shows his drawings of reindeer.

America. Before 1400 some Athapaskans, including the Navajo and the Apache, moved to what is now the southwestern United States. Others migrated to the Great Plains or the Pacific coast. Today the name Athapaskan is usually used for tribes who stayed in northern Canada and Alaska. They include the Chipewyan, the Han, and the Kutchin.

The Athapaskan lived in forests in areas with long, snowy winters. They fished and hunted for animals such as deer, moose, rabbits, and squirrels. They prized the reindeer for its skin and fur as well as its meat. The Athapaskan also gathered plants.

Living in such a cold environment, the Athapaskan spent most of the year in a constant search for food. They traveled in small family groups. While hunting they lived in portable, cone-shaped dwellings that resembled the tepees made by Plains Indians. They used dogsleds to carry their belongings over snow and ice.

For many years only a few French, English, and Russian fur traders entered Athapaskan lands. In the late 1800s many more people arrived in search of gold. The newcomers brought change, but traditional ways survived. In the late 20th century more than 40,000 Athapaskan lived in Alaska and northern Canada, where they are called Dene.

► More to explore

Apache • Chipewyan • Native Americans • Navajo • Plains Indians

Athena

In ancient Greek mythology Athena was the goddess of war, wisdom, and handi-crafts. She was one of the 12 gods believed to live on Mount Olympus. She is associated with the Roman goddess



Minerva because they shared many of the same characteristics. Athena's symbols were the olive tree, which represents peace, and the owl, which represents wisdom.

According to legend, Athena was the favorite daughter of Zeus, the chief god. She was said to have sprung from his head fully grown and clothed in a suit of armor. Like Zeus, Athena wore the aegis, which was a magical breastplate fringed with snakes. It produced thunderbolts when shaken.

Athena was very different from the war god Ares, who was a powerful fighter. Athena used her great wisdom to advise soldiers during wartime. She believed that war should be used only to protect people and to provide justice. In addition, she was known for inventing the plow, taming wild horses, and teaching farmers to yoke oxen. It was also believed that she invented the flute and the trumpet.

The city of Athens was associated with Athena. According to legend, Zeus decided to give the Greek city to the god who offered the most useful gift to the people. Poseidon, the god of the sea, gave the city a water spring. Athena struck the ground with her spear and caused an olive tree to grow. The people were delighted with this gift. Zeus awarded the city to Athena. He named it Athens in her honor.

► More to explore

Ares • Athens • Greece, Ancient
• Mythology • Zeus

Athens



Population
(2001 census),
city, 745,514;
metropolitan
area,
3,187,734

Athens is the capital of Greece, a country of southern Europe. The city is located on the Greek mainland. Mountains surround Athens on three sides. Athens was the most important of the city-states of ancient Greece.

Places of Interest

Parts of many ancient buildings still stand in Athens. On top of a high hill is an ancient fortress known as the Acropolis. It once held temples to Athena, the ancient Greek goddess of wisdom. The city of Athens was named for Athena.



Ruins of ancient monuments stand near modern neighborhoods in the city of Athens, Greece.

Economy

Athens is the main center in Greece for business, trade, and transportation. The city has a busy port on a bay of the Aegean Sea. Most of Greece's manufactured goods are made in Athens. Some of the main factories process food and beverages. Other factories make cloth, soap, chemicals, pottery, ships, and cars. Tourism and publishing also are major industries.

History

People have lived in the Athens area for at least 5,000 years. The earliest surviving buildings date from about 1200 BC.

Ancient Greece was made up of many independent city-states. Athens reached its peak as one of the most powerful city-states in the 400s BC. The leader of Athens during that period was Pericles. He helped develop the form of government known as democracy. Athens also thrived in the 400s BC as a center of culture and learning. The city was home to great playwrights, historians, and scholars.

After Athens lost a war in 404 BC, its power began to decline. Later the Macedonians and then the Romans controlled the city.

The Turkish Ottoman Empire took control of Athens in AD 1456. The Turks ruled the city until 1833. In that year Greece became an independent country, with Athens as its capital. In the second half of the 1900s the city grew rapidly.

In 2004 Athens hosted the Summer Olympics.

► More to explore

Acropolis • Athena • City-State • Greece
• Greece, Ancient

Athletics

► see Track and Field.

Atlanta



Population
(2000 census),
city, 416,474;
(2007 estimate)
519,145

Atlanta is the capital and largest city of the U.S. state of Georgia. It is located in the foothills of the Blue Ridge Mountains.



The Fountain of Rings is part of Atlanta's Centennial Olympic Park. The park was built for use during the 1996 Summer Olympic Games.

Did You Know?

The Jimmy Carter Library and Museum opened in Atlanta, Georgia, in 1986. It houses the official documents as well as letters and photographs of the 39th president of the United States.

Atlanta is the main trade and transportation center for the southeastern United States. The city is also an important financial center. The U.S. government has several offices in Atlanta.

The city had its beginnings in 1837. That year the site was selected as the end stop on a new rail line. A settlement soon grew up around the site. In 1845 it was named Atlanta.

During the American Civil War Atlanta became a rail center for the Confederate states. In 1864 Union troops captured Atlanta and burned most of its buildings. After the war ended, Atlanta recovered quickly. The city became the capital of Georgia in 1868.

In the 1900s Atlanta was the home of the civil rights leader Martin Luther King, Jr. It was also the first major Southern city to elect an African American man (in 1973) and African American woman (in 2001) as mayor. The 1996 Summer Olympics were held in Atlanta.

Atlantic Ocean

The Atlantic Ocean is the second largest ocean on Earth, after the Pacific Ocean. However, the Atlantic drains more of the world's land area than any other ocean. This means that much of the world's river water flows into the Atlantic. The ancient Greeks named the ocean after Atlas, a character in Greek mythology. Atlas stood on pillars in the ocean to hold up the heavens.



Physical Features

The Atlantic Ocean reaches the continents of Europe and Africa to the east. It extends to North America and South America to the west. It also extends from the Arctic Ocean in the north to Antarctica in the south. The equator divides the Atlantic Ocean into parts called the North Atlantic and the South Atlantic.

The surface area of the Atlantic is about 31,830,000 square miles (82,440,000 square kilometers). This is roughly half the size of the Pacific Ocean. The Atlantic's deepest point, at 27,493 feet (8,380 meters), is the bottom of the Puerto Rico Trench, north of the island of Puerto Rico.

Beneath the middle of the Atlantic is a long, undersea mountain range called the Mid-Atlantic Ridge. Along the ridge, hot, liquid rock, called magma, rises from beneath Earth's crust. The magma

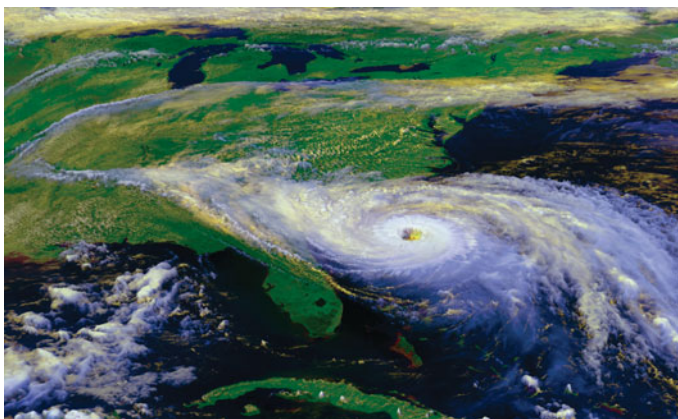
cools and hardens as it spreads out on both sides of the ridge. Volcanoes and earthquakes are common near the ridge.

Undersea volcanoes have formed some of the Atlantic's islands. Examples include the Cape Verde Islands, near Africa, and Bermuda, near North America. Iceland is a volcanic island that rises from the Mid-Atlantic Ridge.

Other Atlantic islands are parts of the same land as nearby continents. Examples include the islands of Great Britain, near Europe, and the Falkland Islands, near South America.

Currents and Climate

The waters of the ocean move in patterns called currents. Currents carry heat and affect climate. In general, the main currents of the Atlantic Ocean move in a clockwise direction in the northern part of the ocean. In the southern part they move in a counterclockwise direction. At the equator, the currents move from east to west. There the water picks up heat. The water then slowly cools as the currents move away from the equator.



A hurricane swirls off the eastern coast of the United States. Hurricanes often form over the warm waters of the Atlantic Ocean.

Large, circular storms called hurricanes often develop in the warm parts of the Atlantic. Hurricanes usually hit coastal areas in the Caribbean Sea and southeastern North America.

Economy

The Atlantic produces much of the world's fish. The ocean is also a source of many minerals. Large deposits of oil, natural gas, and coal are found in the Atlantic. In addition, many cargo ships use the ocean as a trade route.

Exploration

The ancient Egyptians, Celts (Europeans), Phoenicians (Middle Easterners), and Romans sailed on the Atlantic. No one knows how far west they went, however. In about AD 1000 Vikings from northern Europe crossed the Atlantic. They probably reached the island of Newfoundland, off the coast of North America.

In 1492 Christopher Columbus made his famous voyage across the Atlantic in search of a new trading route to Asia. In 1520 Ferdinand Magellan sailed around South America. He discovered the strait (passage), now named after him, that links the Atlantic and Pacific oceans.

Environmental Issues

Humans have heavily polluted some areas of the Atlantic Ocean. This pollution includes sewage from cities, waste from factories, and fertilizers and pesticides from farms. Oil spills from ships or offshore oil wells are sources of pollution, too.

Overfishing is another important environmental issue in the Atlantic. So many fish have been caught that some types are in danger of disappearing entirely. Some countries have set limits on how many fish can be caught in certain areas. They have also set up programs to protect the fish that are left and to rebuild the fish populations.

► **More to explore**

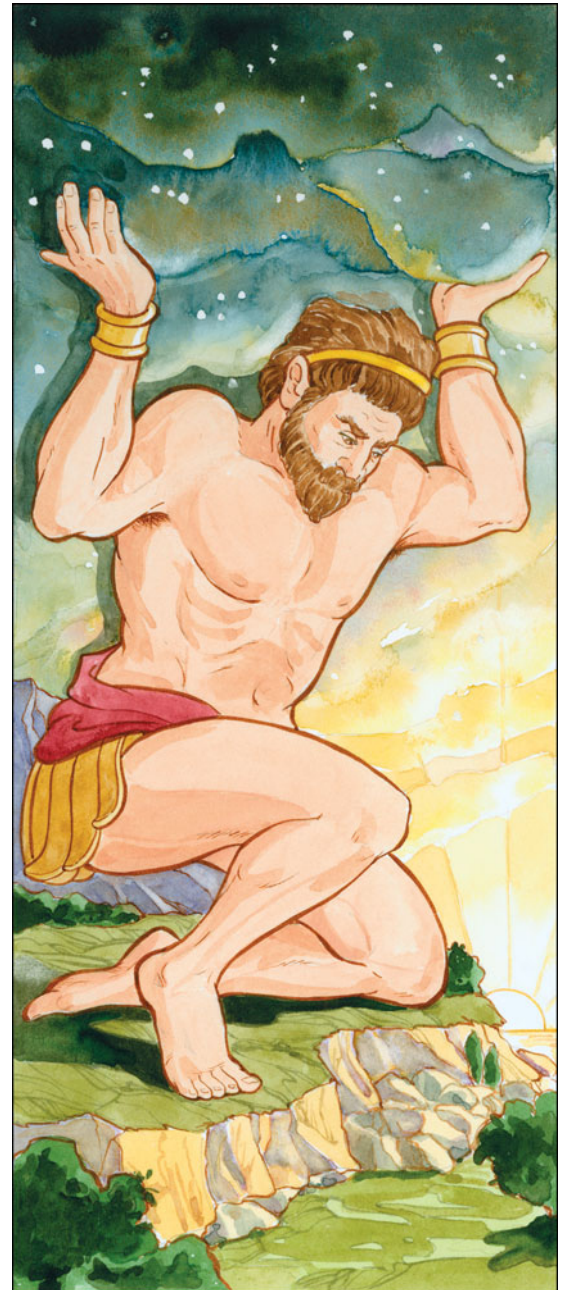
Ocean • Pacific Ocean

Atlas

In ancient Greek mythology Atlas was doomed to carry the heavens on his shoulders. In some stories, he had to support the pillars that separate heaven and Earth. Artists often pictured him carrying the heavens or a globe.

Atlas' mother was Clymene, a minor goddess known as a nymph. His father was Iapetus, a Titan. The Titans were giants who ruled the world. Atlas fought with the Titans in a war against Zeus. When Zeus won the war, he became chief god. Zeus punished Atlas by making him hold up the sky.

Another story told that Atlas was the father of nymphs called the Hesperides. They guarded a tree that bore golden apples. The hero Heracles (Hercules) had to perform 12 tasks to make up for killing his children. One of these tasks was to steal the golden apples. Heracles asked Atlas to help. He offered to carry the heavens for Atlas while Atlas got the apples. Atlas agreed and fetched the apples. He planned to refuse to take



back the heavens. But Heracles tricked Atlas into picking up his burden again.

In another story Perseus turned Atlas into a mountain by showing him the head of the monster Medusa. The Atlas Mountains of Africa were named for him.

► **More to explore**

Greece, Ancient • Heracles • Mythology
• Titans • Zeus

Atlas



An atlas can teach children about the world.

An atlas is a bound collection of maps. Atlases vary in size and in the information presented. Some travelers carry small atlases that give road and street directions. Other atlases are huge, very detailed books that need a reading stand for support. A general reference atlas focuses on place locations. A special-subject atlas deals with a single subject, such as agriculture or climate.

In Greek mythology Atlas was a giant condemned to hold up the heavens. In the 1500s a man named Gerardus Mercator put together a collection of maps. His collection included a picture of Atlas holding a globe on his shoulders. From then on, the word atlas was commonly used to describe a collection of maps.

► More to explore

Map and Globe

Atmosphere

The atmosphere is the layer of gas that surrounds Earth. It is often called air.

Other planets, and some of their larger moons, also have atmospheres.

Earth's atmosphere consists of several different gases. The gases are held close to Earth by a force called gravity. Near Earth's surface, the atmosphere is about three fourths nitrogen and one fifth oxygen. At higher elevations, the atmosphere is mostly hydrogen and helium. Surprisingly, air has weight. It is heaviest at sea level. There the gas particles are pressed together by the weight of the air above them. Air becomes lighter away from Earth's surface.

Scientists divide the atmosphere into five regions, or layers. The layer closest to Earth is the troposphere. It extends up to about 6 miles (10 kilometers) above Earth's surface. Most of Earth's weather, including the wind and most clouds, exists in the troposphere.

The second layer, the stratosphere, extends to about 30 miles (50 kilometers) above Earth's surface. The stratosphere includes the ozone layer. Ozone blocks much of the sun's radiation that would harm plants and animals if it reached Earth.

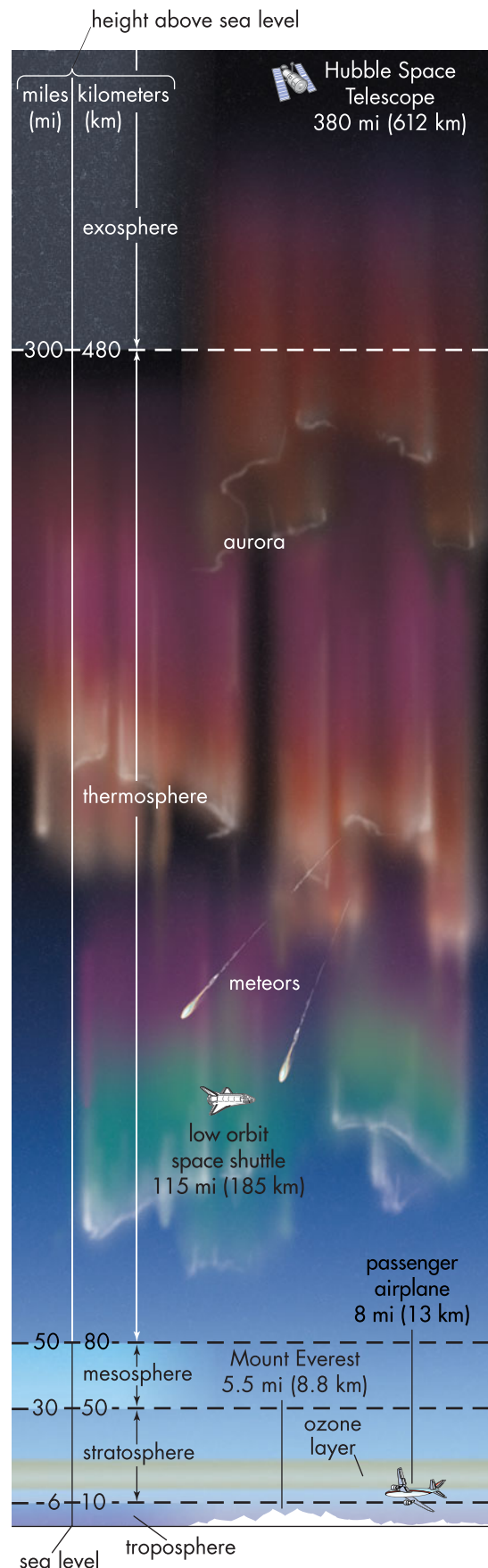
The third layer is the mesosphere. It extends up to about 50 miles (80 kilometers) above Earth's surface.

The fourth layer, the thermosphere, ranges from about 50 to 300 miles (80 to 480 kilometers) above Earth.

The fifth and highest layer of the atmosphere is the exosphere. This layer ends

Did You Know?

The atmosphere protects Earth's surface from being hit by objects from outer space. These objects are called meteoroids. Most burn up as they enter the atmosphere.



where Earth's gravity is too weak to prevent particles of gas from drifting into space.

Atom

The tiny particles called atoms are the basic building blocks of all matter. Atoms can be combined with other atoms to form molecules, but they cannot be divided into smaller parts by ordinary means.

The word atom comes from the Greek word *atomos*, meaning “indivisible.” The ancient Greeks were the first to think of the atom as the basic unit of all matter. It was not until the early 1800s, though, that scientists began to understand how atoms work.

Structure

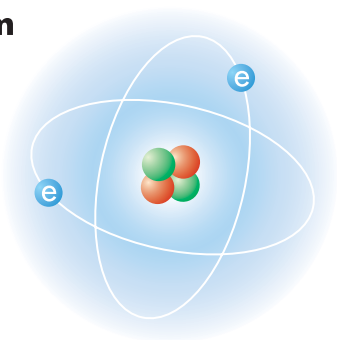
Each individual atom is made up of smaller particles—electrons, protons, and neutrons. These are called subatomic particles. At the center of an atom is a nucleus. The nucleus consists of protons and neutrons. Protons carry a positive electrical charge, while neutrons carry no electrical charge. Together, protons and neutrons are called nucleons. Surrounding the nucleus is a cloud of negatively charged electrons.

Scientists believe that subatomic particles—protons, neutrons, and electrons—are themselves made up of smaller substances. The substances are called quarks and leptons.

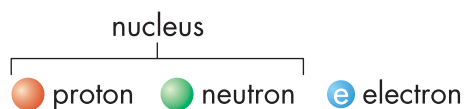
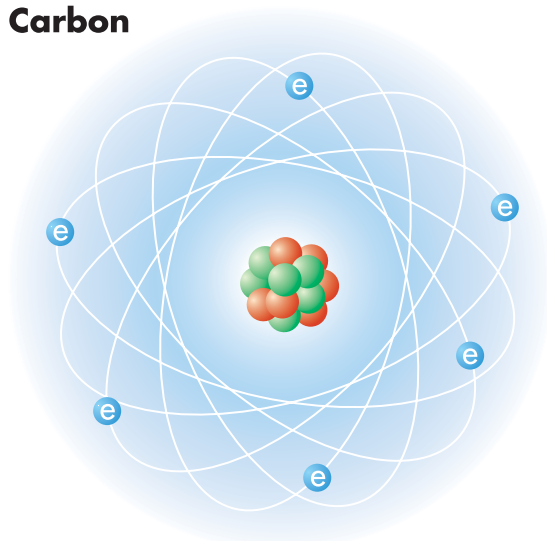
Properties

The single most important thing to know about an atom is how many protons it has in its nucleus. This is known as its atomic number. The atomic number determines what kind of atom it is. Every atom is associated with a specific chemical element. An atom is the smallest unit of an element, and each chemical element has a unique atomic number. For instance, hydrogen has an

Helium



Carbon



All atoms have the same basic parts. These are a nucleus and at least one particle called an electron. The nucleus contains protons and neutrons. Diagrams of two kinds of atoms show that each kind of atom has a different number of electrons.

atomic number of 1 because every hydrogen atom has one proton in its nucleus. No other element has an atomic number of 1.

Another property of atoms is their atomic weight. This is roughly equal to the total number of protons and neutrons in an atom. Atoms that have the same atomic number but different atomic weights are called isotopes. Carbon-12, the ordinary form of carbon, has six protons and six neutrons per atom. Carbon-14 is an isotope with eight neutrons per atom. It still has six protons. If it did not have six protons, it would not be carbon.

An ordinary atom has an equal number of protons and electrons. This means that the positive and negative charges are balanced. Some atoms, however, lose or gain electrons in chemical reactions or in collisions with other particles. Ordinary atoms that gain or lose electrons are called ions. If a neutral atom loses an electron, it becomes a positive ion. If it gains an electron, it becomes a negative ion.

► More to explore

Chemical Element • Chemistry • Matter
• Molecule

Atsina

► see Gros Ventre.

Attucks, Crispus

An event called the Boston Massacre helped to turn American colonists

Did You Know?

One proton is about as heavy as 2,000 electrons.



Crispus Attucks

against British rule, leading to the American Revolution. Crispus Attucks was killed by British soldiers during the massacre, and many consider him to be the first person to lose his life in the struggle for independence.

Crispus Attucks was of African and Native American ancestry. He was born in about 1723 and probably grew up in a Natick Indian settlement. He may have escaped from slavery in 1750. Most likely he became a sailor on whaling ships.

By 1770 many people in Boston, Massachusetts, were unhappy with British rule. When a crowd gathered on March 5 to challenge British troops, Attucks quickly came to the front of the group.

As the Americans waved their weapons and shouted, the British opened fire.

Attucks was shot twice. He was the first to die, but four others were also killed and six were injured.

Attucks was immediately recognized as a hero. It is said that 10,000 people joined his funeral procession. In 1888 Attucks was honored with a monument in Boston.

► More to explore

American Revolution • Boston

Augusta



Population
(2000 census)
18,560; (2007
estimate)
18,367

Augusta is the capital of the U.S. state of Maine. The city lies along both banks of the Kennebec River. Ships travel on the



Buildings of Augusta, Maine, look out onto the Kennebec River.

river from Augusta to the Atlantic Ocean, about 40 miles (65 kilometers) away.

Some of Augusta's factories process foods. Others make paper products, computer products, steel, and shoes. Many people in Augusta work for the state government or in education or tourism.

Traders first came to the area in the 1600s. They established a trading post on the site because of its location on the river. In 1754 a company built Fort Western to protect the site from Indian attacks. A village soon grew up around the fort. In 1797 the village was named Augusta. Augusta was chosen as the capital of Maine in 1827.

► More to explore

Maine

Augustus

The first emperor of Rome was Augustus. During his long reign the Roman world entered an era of wealth, peace, and cultural achievement that became known as the Augustan Age.

Augustus was born on September 23, 63 BC. His original name was Gaius Octavius. He was related to Julius Caesar, the Roman leader who was murdered in 44 BC. After Caesar's death he found out that Caesar had chosen him to be the next leader. From then on he was called Octavian.

Other leaders challenged Octavian for power. He finally defeated the last of

these—Mark Antony—in 31 BC.

According to historians, Octavian's victory over Antony marked the beginning of the Roman Empire. Octavian then controlled the whole Roman world. In 27 BC the Senate gave him the title Augustus (the exalted or sacred one).

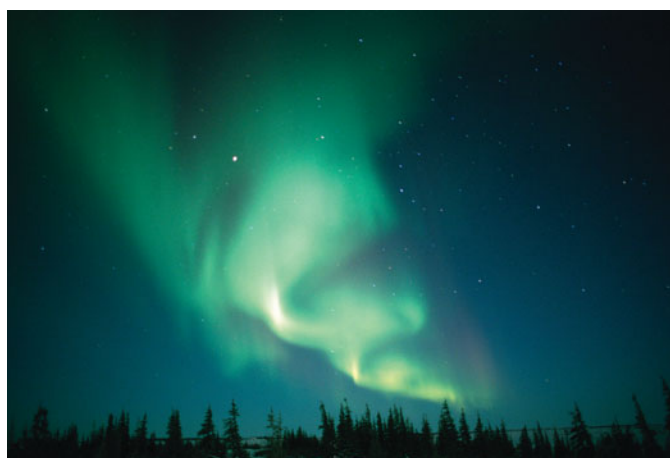
Augustus' armies conquered more territory for the Roman Empire until the Germans stopped them in AD 9. Augustus then focused on improving Rome. He founded cities, built roads, encouraged agriculture, and promoted the arts. Augustus died on August 19, AD 14. Tiberius, his adopted son, then took over as emperor.

► More to explore

Caesar, Julius • Rome, Ancient

Aurora

Auroras are dazzling displays of colored light that sometimes appear in the night sky. They occur in Earth's far northern and far southern regions. In the Northern Hemisphere such a display is known as aurora borealis, or the northern lights.



An aurora lights up the sky over Churchill, Manitoba, a city in northern Canada.

In the Southern Hemisphere it is called aurora australis, or the southern lights.

Auroras take many shapes and forms, with arcs and rays of colored light being the most common. The light may also look like shimmering curtains, bands, waves, or clouds. An aurora constantly changes shape as the light moves across the sky. The light also may brighten and fade.

Auroras are caused by the sun. The sun sends out a stream of electrically charged particles called the solar wind. The solar wind travels from the sun toward Earth at great speed.

Earth is a huge magnet surrounded by a magnetic field. Earth's magnetic field forces the charged particles in the solar wind toward the planet's northern and southern polar regions. The particles move downward through Earth's upper atmosphere. As they do, they crash into atoms and molecules of gases such as oxygen and nitrogen. These collisions cause the atoms and molecules to give off light. This light is an aurora.

An aurora's colors are determined by the different gases that give off the light. They also depend on the height of the gases. An aurora usually begins as white light. Then the light turns yellowish green. This color is produced by oxygen. Higher up, oxygen gives off red light. Nitrogen produces blue or violet light.

► More to explore

Atmosphere • Light • Sun

Austin



Population
(2000 census),
city, 656,562;
(2007 estimate)
743,074

Austin is the capital of the U.S. state of Texas. The city is located on the Colorado River.

Companies that make computers and other high-technology products are important to Austin's economy. Other companies in Austin provide business services. Many city residents work in government offices or in health care or education.

Austin began as the village of Waterloo in the 1830s. In 1839 the village became the capital of the Republic of Texas. It was then renamed in honor of Stephen Austin, who started early settlements in Texas. In 1845 Texas became a U.S. state, with Austin as its capital.

The first railroad service to Austin began in 1871. That helped the city grow as a trading center for ranchers and farmers. In the early 1900s people started building factories in Austin. Later many high-technology industries moved to the city. As a result, the city's population grew rapidly.

► More to explore

Texas

Did You Know?

Auroras are named after Aurora, the ancient Roman goddess of the dawn.

Australia



Australia is the only country that takes up a whole continent. It is known for its vast Outback, the Great Barrier Reef, and its unique wildlife. The capital of Australia is Canberra.

Geography

Australia is one of the largest countries in the world, but it is also the smallest continent. Located south of Asia, Australia lies between the Indian Ocean and the Pacific Ocean. Off the southeastern coast is the island of Tasmania. It has more than 4,000 lakes. Along Australia's northeastern coast is the world's largest coral reef, the Great Barrier Reef.

The western half of the continent is a plateau with several deserts, including the Great Victoria Desert. East of the plateau is a lowland area that rises to the Great Dividing Range, a range of mountains on the east coast. In the southeast are the Australian Alps. There, Mount Kosciusko, Australia's tallest mountain, stands 7,310 feet (2,228 meters) high. The Darling and Murray rivers also run through the southeast.

Australia is very dry. Most areas have hot summers and mild winters. Because Australia is in the Southern Hemisphere, summer starts in December, and winter starts in June.





Uluru-Kata Tjuta National Park is located in Australia's Northern Territory. The area is sacred to Australian Aborigines.

Plants and Animals

Australia's plants vary from region to region. The rain forests of the northeast include flowering plants, palms, and laurels. Woodlands and forests cover eastern Australia. Eucalyptus trees are common in the highlands of the south and at the edges of the deserts. Desert shrubs and grasses grow in dry areas.

The country is home to many unique animals, including emus (large flightless birds), dingoes (wild dogs), and platypuses (egg-laying mammals). Many of the world's marsupials live in Australia—for example, kangaroos, koalas, and wallabies. Crocodiles, lizards, snakes, turtles, and parrots also live there.

People

More than 90 percent of Australians have European roots. Australia welcomed many immigrants, or people from other countries, over the years. However, entry tests were set up to make it very hard for nonwhites to settle there.

This changed in 1973. Since then, many Asians have immigrated to the continent. Aborigines, the native people of Australia, make up a small percentage of the population.

Almost 70 percent of Australians are Christians. There are also small groups of Buddhists and Muslims. Many people do not follow any religion.

Few people live in the central region, called the Outback or "bush." About 85 percent of all Australians live in cities, mostly along the coasts. The official language is English.

Economy

Australia is a prosperous country. Most people work in trade, businesses that serve the public, and manufacturing. Manufacturers make food, print, and metal products; chemicals; and machinery.

Australia's rich natural resources include oil, coal, and natural gas. Mines provide



A bridge crosses the Yarra River in Melbourne. The city is Australia's second largest, after Sydney.



TIMELINE

Dutch explorers name the continent New Holland.

Britain sets up the first colony in Australia.

Australia separates from Britain.

Sydney hosts the Summer Olympic Games.

1644

1770

1788

1851

1901

1992

2000

James Cook claims Australia for Great Britain.

A gold rush brings many settlers to Australia.

Aborigines win the right to claim their traditional lands.

iron, bauxite, copper, opals, and sapphires.

Agriculture and fishing are small parts of Australia's economy. Still, Australia is one of the world's largest producers of wool. The wool comes from more than 100 million Australian sheep. Farmers grow wheat, vegetables, fruits, nuts, cotton, and other crops.

History

Aborigines lived in Australia for at least 40,000 years before Europeans arrived. They came from Asia by boat or by land that is now underwater.

European Explorers

Portuguese and Spanish explorers may have landed in Australia in the 1500s. In the 1600s several Dutch explorers reached the continent. They included Dirck Hartog and Abel Tasman. Hartog discovered the west coast, and Tasman sailed along the southern tip of what is

now called Tasmania. Because of all these voyages the Dutch named the continent New Holland in 1644. But they did not settle there.

William Dampier, an English pirate turned explorer, landed on the west coast twice in the late 1600s. In 1770 Captain James Cook landed in south-eastern Australia and claimed it for Great Britain. He named the region New South Wales.

First Fleet and Settlement

Captain Cook thought that New South Wales was a good place for settlement. At the time, England's prisons were overcrowded. So the English government decided to send prisoners to Australia to start a penal colony—a place where criminals are sent to live.

Captain Arthur Phillip was in charge of the First Fleet. He led 11 ships carrying about 200 marines, a few free settlers,

more than 700 convicts, food stores, and farm animals. The trip took eight months and conditions were very hard. They reached Australia in January 1788 and settled in a bay that they named Sydney Cove. Phillip became the first governor of the colony.

Convicts and settlers worked to clear land and to establish farms. They were not used to the climate, which was different from England's, so the colonists struggled to survive. But soon more convicts and settlers arrived. The settlement grew bigger and stronger.

In the 1800s other parts of the country were settled. Some were also penal colonies. In 1851 the discovery of gold drew thousands of new immigrants to Australia. The settlements grew and became colonies separate from New South Wales. They became Tasmania, Western Australia, Victoria, Queensland, and South Australia.

The flood of settlers nearly wiped out the aboriginal population. Many Aborigines died while fighting for their land or from diseases brought by the Europeans.

Independence and War

By the late 1800s the six separate colonies each had an elected parliament, or group of lawmakers. In 1901 they became states when they joined together to form a federation. The new Commonwealth of Australia had a national parliament and six state parliaments. It kept ties with Britain, however, as part

of the British Commonwealth (a group of former British colonies).

When World War I began, Australians fought alongside the British Army. Many Australians died during the battle of Gallipoli in 1915. Australia also supported Britain when World War II began in 1939. In the 1940s the Japanese attacked several Australian cities. Their airplanes bombed Darwin, and submarines fired on Sydney. After the war Australia's population grew rapidly. Many immigrants came from war-torn Europe.

Recent Events

In the 1970s Australia started to focus less on Europe and more on its Asian neighbors. Many Asian immigrants arrived, and trade increased between Australia and Asian countries.

In the 1990s Aborigines won some rights to land. They also won more respect from white Australians. Many still face hardships, however.

The British monarch is still the head of state in Australia. Some Australians have called for change. They want the country to become a republic with a president as head of state. In 1999, however, Australians voted against a complete separation from Britain.

► More to explore

Aboriginal Peoples • Canberra • Cook, James • Eucalyptus • Great Barrier Reef • Great Victoria Desert • Marsupial • Parliament • Platypus • Tasmania

Facts About AUSTRALIA



Population
(2008 estimate)
21,338,000

Area
2,969,978 sq mi
(7,692,208 sq km)

Capital
Canberra

Form of government
Federal parliamentary state

Metropolitan areas
Sydney, Melbourne, Brisbane, Perth, Adelaide

Austria



Most of Austria's mountains are part of a large mountain chain called the Alps.

Located in central Europe, Austria is a small, mountainous country. The capital of Austria is Vienna.

Geography

Austria is bordered by Switzerland, Liechtenstein, Germany, the Czech Republic, Slovakia, Hungary, Italy, and Slovenia. Some of the highest mountains of the Alps are in central and western Austria. Grossglockner, the highest peak, is 12,460 feet (3,798 meters) tall.

The major lowland areas lie in northern and eastern Austria. The northern lowland is the valley of the Danube River. Many other rivers, including the Enns, Inn, and Drava, flow through the valleys of the Alps. They form several passes through the mountains. Brenner Pass is the most important pass. It connects Austria with Italy.

Western Austria gets more rain and snow than eastern Austria. The east also has a greater range of temperatures. In some mountainous regions there is snow all year.

Plants and Animals

Austria is the most densely forested country in central Europe. Beech, birch, and oak trees grow in the warmer zones. Firs, larches, and pines grow in the hills and mountains.

Wild animals include brown bears, deer, hare, foxes, badgers, eagles, falcons, owls, cranes, swans, storks, and turkey vultures. In Austrian rivers live trout, grayling, pike, perch, and carp.

People

German is the official language of Austria. More than 90 percent of the people are Austrian. Small minority groups include Slavs, Turks, and Hungarians.



Most Austrians are Roman Catholic. About two thirds of Austrians live in cities and towns. Vienna is the largest city.

Economy

Services, or businesses that serve the public, and manufacturing are the most important parts of Austria's economy. Tourism and banking are major areas of the service industry. Tourists come for Austria's famous skiing resorts, cultural events, and scenic beauty. Manufacturers make machinery, food products, metals, and chemicals.

Austria's natural resources include lignite (brown coal), iron ore, petroleum (oil), natural gas, and magnesite (used to make magnesium). Austria is one of the world's leading producers of natural magnesite.

Austria uses less than half its land for farming and grazing. The major crops are sugar beets, corn, wheat, barley, potatoes, apples, grapes, and rye. Pigs, cattle, and chickens are the main livestock.

History

Romans, Germans, Slavs, Hungarians, and others have invaded Austria during its long history. A German family called the Hapsburgs ruled Austria and other parts of Europe from 1282 until 1918. In the 1800s the Hapsburgs joined with Hungary to form an empire called Austria-Hungary, which controlled much of central and eastern Europe. After the collapse of the empire in 1918,



A street in the Austrian city of Salzburg is lined with shops and cafés.

the country was reduced to one eighth of its original size.

German leader Adolf Hitler invaded Austria and made it a part of Nazi Germany in 1938. Austria was divided into four zones in 1945, after Germany's defeat in World War II. The United States, Great Britain, France, and the Soviet Union each occupied one of the zones. Austria's government had limited powers.

In 1955 Austria gained independence after its leaders promised to keep neutral, or stay out of foreign affairs. The country became stable, both politically and economically, in the 1970s. In the 1990s, however, some politicians began to blame immigrants for crime and economic problems. Others opposed these views.

► More to explore

Alps, The • Germany • Hapsburgs
• Vienna • World War II

Facts About AUSTRIA



Population
(2008 estimate)
8,338,000

Area
32,383 sq mi
(83,871 sq km)

Capital
Vienna

Form of government
Federal republic

Major cities
Vienna, Graz,
Linz, Salzburg,
Innsbruck,
Klagenfurt

Automobile

It is hard for anyone today to imagine what life was like before there were automobiles, or cars. Automobiles have made it easy for people to travel within a city or across a continent. They have also influenced where people live. People once had to live near their jobs, but now they can live farther away and drive to work.

Yet automobiles have brought problems as well. Tens of thousands of people are killed or injured each year in traffic accidents. Cities are often congested with huge traffic jams. And gasoline is a limited resource that pollutes the atmosphere when burned as fuel.

Parts of an Automobile

All automobiles have certain basic parts. The body of an automobile is the outer shell that encloses the vehicle's mechanical parts and its passengers. The body is attached to the chassis. This consists of a frame that holds all the other major

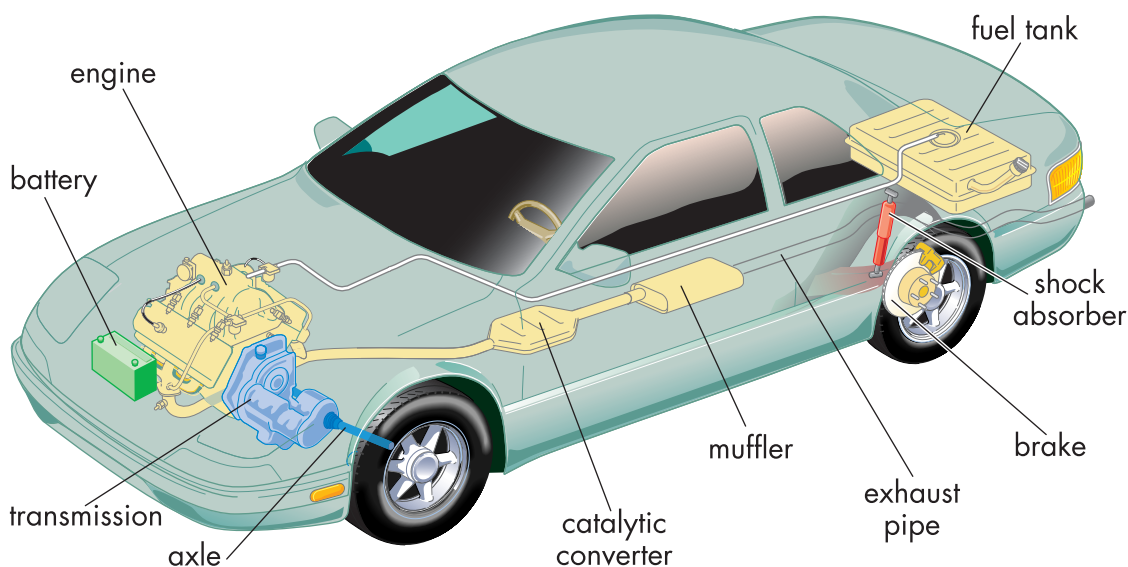
parts of the automobile together. Those other parts include the engine, a steering system, brakes, and the wheels.

How Automobiles Work

A driver operates a car by pressing on pedals to make it go and stop and by turning the steering wheel to guide where the car goes. The pedals and steering wheel work because they are part of a larger system.

Engine and Related Parts

Most automobiles are powered by internal-combustion engines. In such an engine a mixture of air and gasoline enters a tubelike cylinder through valves. There the mixture makes small explosions. Each explosion produces gases that expand rapidly and push against a device called a piston on one end of the cylinder. The piston goes up and down as the gases expand and contract. Rods connected to the pistons convert that movement into the power that eventually turns the wheels. Most automobile engines have four to eight cylinders.



Many parts work together to make an automobile run.

The air-fuel mixture that enters the engine cannot ignite by itself. It needs an electric spark. This comes from devices called spark plugs. They get their electric current from a battery. The battery also powers the automobile's lights, horn, turn signals, windshield wipers, starter, and instruments such as the gasoline gauge.

An exhaust system carries burned gases from the engine to the muffler. The muffler cools the gases. It also reduces their pressure. This reduces the noise coming from the tailpipe. Modern cars are also equipped with a device called a catalytic converter. The catalytic converter uses chemicals to reduce exhaust pollution.

Power Train

The engine provides power to make a car go, but something else must turn the wheels. The parts of the car that transmit, or deliver, power from the engine to the wheels are together called the power train. When a car is starting or moving uphill the engine must deliver more power than when it is cruising on level ground. The transmission uses gears to reduce or increase the speed and power of the engine. The drive shaft carries the power from the transmission to the axle, which connects the wheels.

Other Mechanical Parts

Once a car is moving it is important to be able to make it stop. When a driver presses the brake pedal, pistons force fluid through small, flexible pipes to brakes at each wheel that stop the vehicle.

The wheels of an automobile are part of a system called the suspension system. This consists of springs that absorb bumps and shock absorbers that cushion the spring movement. The air-filled tires of an automobile also cushion the ride.

History

The first true automobile was a machine that had three wheels and was powered by steam. It was built by Nicolas-Joseph Cugnot of France in 1769. It was heavy and moved very slowly. Many manufacturers produced steam-driven automobiles during the late 1890s and early 1900s. A disadvantage of steam was that water had to be brought to a boil before the car could go.

During this same period other manufacturers produced cars run by electric motors. Electric cars ran smoothly and were easy to operate. However, they did not run well at high speeds. They also had to have their batteries recharged every 50 miles (80 kilometers) or so.



Two men ride an early automobile in about 1901. The first cars looked very different than the cars of today.

Did You Know?

British and American people use different words for certain parts of cars. For example, the part called the hood in the United States is the bonnet in Great Britain.

Gas Engines

Étienne Lenoir of France developed a gasoline-powered internal-combustion engine in 1860. In 1876 the German Nikolaus Otto built an improved gasoline engine. Gasoline engines proved to be more reliable than the other kinds. The brothers Charles E. and J. Frank Duryea built the first successful gasoline-powered car in the United States in 1893. Soon several people set up factories to produce cars.

Development of the Automobile Industry

Henry Ford made his first automobile in Detroit in 1896. Ford introduced the assembly line in 1913. This made it easy to produce many cars very quickly. Assembly-line workers stay in one place and do only a single task as the parts pass by on a conveyor. Ford soon sold millions of cars. Several other companies were established at this time as well.

Innovations

In the period after World War I (1914–18), automobiles became easier to operate and more comfortable. Steel bodies and heaters became common.

After World War II (1939–45) automakers began using power steering, power brakes, and automatic controls for windows and seats. Air conditioning also became available.

In the late 1950s, European compact cars like the Volkswagen Beetle caused a sensation. U.S. makers built their own compact cars starting in 1959.

The Problem of Oil

The gasoline used in automobiles comes from petroleum (oil). As the United States began to use up its own oil supplies, it looked to other countries for more. In 1973 the oil-producing countries stopped shipping as much oil to the countries that needed it. This caused high prices and long lines at gas stations. It also made automakers work to produce cars that did not use as much gasoline. Japanese companies were especially successful at this.

Automobiles also cause air pollution. As gasoline is burned it produces harmful gases. Some scientists blame these gases for a problem called global warming. By the 21st century some automakers had created vehicles that combined gasoline and electric power.

Safety

Early cars were very dangerous to ride in. Since then automobile manufacturers have worked to create safer cars. They installed such devices as seatbelts and air



Hybrid cars use less gasoline than other cars. They rely on an electric motor for part of their power.

bags to protect riders in a crash. They have also tried to improve the way cars are built so that the cars will survive a crash better.

► **More to explore**

Global Warming • Internal-Combustion Engine • Petroleum • Pollution • Road

Avalanche

An avalanche is a large amount of snow that quickly moves down a slope. An avalanche can be deadly because it will bury or sweep away anything in its path. Large amounts of sliding earth or other materials may also be called avalanches. But these are often known as landslides.

Many different conditions make an avalanche possible. An avalanche is more likely to happen on a slope without trees or large rocks. These things help to keep snow in place. A weak layer of snow also makes an avalanche likely. For example, melting and refreezing may cause a layer of snow to become slick. Snow piling on top of this weak layer can easily slide off.

Heavy snowfall, strong wind, and rising temperature all can start an avalanche. Falling rocks or ice also can cause snow to slide. Even the movement of a skier or a snowmobile can begin an avalanche.

► **More to explore**

Landslide • Snow

Avocado

Although many people think that avocados are vegetables, they are actually



The avocado is a fruit with a large seed inside.

fruits. An avocado is a berry with one large seed, or pit, in the center.

There are more than 1,000 varieties of avocado. Avocado trees grow wild in Mexico and in Central and South America. American Indians in those areas developed some avocado varieties thousands of years ago. Today farmers grow avocados in many places with mild winters and plenty of sun.

Avocado trees have broad, shiny leaves that stay green all year. The trees can grow up to about 65 feet (20 meters) tall. Their fruits are round or pear-shaped. They vary widely in size. On the outside the fruits are green or dark purple. The greenish or yellowish flesh inside turns soft after picking.

Avocados are rich in fat, protein, and several vitamins. They can be eaten raw. Mashed avocado is the main ingredient in the Mexican sauce called guacamole.

Axum

► see Aksum.

Did You Know?

People in mountainous areas protect themselves from avalanches in several ways. Special fences hold snow in place. Barriers also help to stop sliding snow.

Azerbaijan

The country of Azerbaijan sits at the crossroads between central Asia, Europe, and the Middle East. The capital is Baku.

Azerbaijan is bordered by Russia, Georgia, Armenia, and Iran. The Caspian Sea lies to the east. A part of Armenia separates the Azerbaijani republic of Nakhichevan from the rest of Azerbaijan.

The Caucasus Mountains run through northern and southern Azerbaijan. The central area is a large plain crossed by the Kura River. Most of Azerbaijan is dry, with hot summers and mild winters. The region has many earthquakes.

Most of the country's people are Azerbaijani, though there are a few Russians, Armenians, and other minority groups. Most people speak Azerbaijani, a Turkic language. More than 90 percent are Muslims. However, the people of the



Nagorno-Karabakh region (an area also claimed by Armenia) are mostly Eastern Orthodox Christians. About half of the people live in cities.

Azerbaijan's economy is based on its natural resources and agriculture. Its major resources are petroleum (oil) and natural gas. Crops include grains, vegetables, fruit, sugar beets, cotton, tobacco, and tea. Sheep, goats, and cattle provide wool and meat. Manufacturers make mainly food and petroleum products.

Azerbaijan's written history is more than 2,000 years old. At various times Arabs, Persians, Turks, and Mongols dominated the land. Russia took over Azerbaijan in the early 1800s. In 1918 Azerbaijan declared its independence. In 1920, however, the new Soviet Union invaded Azerbaijan. At first the Soviets combined Azerbaijan with Georgia and Armenia. In 1936 Azerbaijan became a separate Soviet republic. With the breakup of the Soviet Union, Azerbaijan gained independence again in 1991.

In the late 20th and early 21st centuries Azerbaijan fought with Armenia over control of the Nagorno-Karabakh region. Armenia seized control of some Azerbaijani land.

► More to explore

Baku • Caspian Sea • Union of Soviet Socialist Republics



Facts About AZERBAIJAN



Population
(2008 estimate)
8,178,000

Area
33,400 sq mi
(86,600 sq km)

Capital
Baku

Form of government
Republic

Major cities
Baku, G nc , Sumqayit (Sumgait), Ming cevir (Mingeaur),  li Bayramli

Aztec

In the 1400s and early 1500s the Aztec people controlled a large empire in the area that is now central and southern Mexico. At its most powerful, the Aztec Empire spread over 80,000 square miles (207,000 square kilometers). Montezuma II, the last great Aztec emperor, ruled over 5 to 6 million people.

How the Aztec Lived

The capital city of the Aztec was Tenochtitlán. It was built on land that today is part of Mexico City. Tenochtitlán reflected the power and wealth of the empire. It had gleaming white palaces and temples on top of pyramids. City officials lived in houses made from stone and adobe, or sun-dried clay. Farmers lived in huts made of woven rods and twigs covered with clay.

Most Aztec were farmers. They grew corn, beans, peppers, squash, tomatoes, tobacco, and cotton. Other Aztec were traders and craftsmen.

The Aztec spoke a language called Nahuatl. They had no alphabet of their

own, but they used picture writing to record their history.

Religion was very important to the Aztec. They worshipped several gods who represented the forces of nature, such as rain or sun. The god of war was important, too.

The Aztec often used human sacrifice to get help from the gods. This practice involved killing a person to honor a god. The Aztec believed that because life was humankind's most precious possession, it was the best gift for the gods. They sacrificed thousands of prisoners captured in war.

History

The Aztec probably moved into central Mexico from the north in about AD 1200. There they took on parts of the cultures of earlier peoples, including the Toltec, the Maya, and the Zapotec. They founded Tenochtitlán in about 1325. They conquered neighboring peoples to build up their empire.

The Aztec were at the height of their power when Hernán Cortés and his Spanish soldiers arrived in 1519. The Spanish put the emperor Montezuma II in prison, where he died. In 1521 the Spanish took control of Tenochtitlán, ending the Aztec Empire. Many of the Indians living in the Mexico City region today are descendants of the Aztec.



An Aztec drawing shows Aztec and Spanish soldiers just before a battle. The Spanish are in a building.

► More to explore

Cortés, Hernán • Maya • Mexico
• Mexico City • Toltec

Britannica Student Encyclopedia

A



A collage of various subjects including a snake, a fly, a satellite, a globe, a flower, a knight, a boat, and a lemur.

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B

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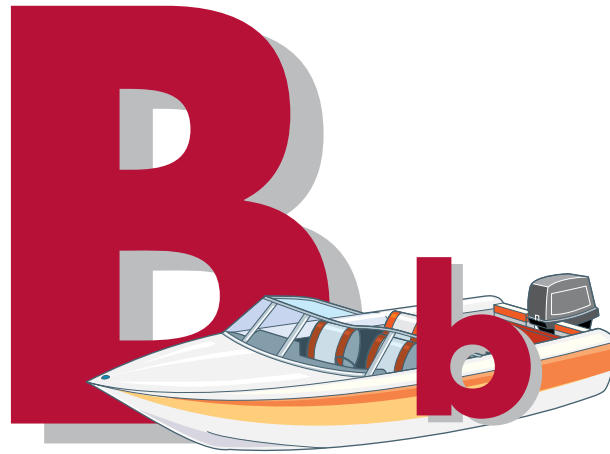
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Johann Sebastian Bach's music did not become popular until about 50 years after his death.

(See Bach, Johann Sebastian.)

Some kinds of bamboo can grow as much as 1 foot (0.3 meter) per day.

(See Bamboo.)

Boats were once made of wood or other natural substances. Today they are often made of metal, fiberglass, or plastic.

(See Boat.)

Bonobos, a type of ape, live only in the rain forests of the Democratic Republic of the Congo.

(See Bonobo.)

People have been making bronze, a mixture of copper and tin, for more than 5,000 years.

(See Bronze.)

Bach, Johann Sebastian

German musician Johann Sebastian Bach is considered one of the world's greatest composers of music. He was also a gifted player of the organ and the harpsichord (another keyboard instrument).

Bach created hundreds of musical compositions, including works for choir, orchestra, and individual instruments, especially the organ. Among his many masterpieces are the six *Brandenburg* concertos, which have parts for both an orchestra and solo instruments. Bach composed many works for Lutheran church services. He also wrote longer sacred pieces, such as the *Mass in B Minor* (1749), for choir, soloists, and orchestra.



A painting from 1720 shows Johann Sebastian Bach.

Early Life

Bach was born on March 21, 1685, in Eisenach (now in central Germany). His eldest brother, who was an organist, probably gave him his first keyboard lessons. Bach attended school in Lüneburg, where he sang in a boys' choir. By the time he left, he was a skilled organist and composer.

Career

Bach worked as a musician and composer in churches and in the service of German noblemen in various cities. His first major position was as the official organist for a duke at Weimar. Later he also became director of the duke's orchestra. His duties included composing a sacred cantata—a type of music for use during church services—every month.

In 1723 Bach became the director of church music for the city of Leipzig. During his early years in this job, he composed many cantatas, sometimes up to one per week. At Leipzig he also directed an orchestra off and on from 1729 into the early 1740s. Bach died in Leipzig on July 28, 1750.

During his lifetime Bach was known mainly for his skill as a musician. After his death his compositions were mostly forgotten until the early 1800s. Then people began to rediscover his works. Today the music of Bach is highly acclaimed and is performed frequently.

► More to explore

Classical Music • Musical Instruments
• Orchestra

Bacteria

Bacteria are small organisms, or living things, that can be found in all natural environments. They are made of a single cell. Most bacteria can be seen only with a microscope.

Bacteria do not have most of the structures found in the cells of other organisms. They are much simpler and smaller than all other cells of living things.

Bacteria take in food and send out waste through their cell walls. Most bacteria reproduce by dividing down the middle to form two separate cells. These each divide again to form a total of four cells. Through this process, billions of bacteria may form from a single bacterium in only 24 hours.

Bacteria that cause diseases can get into the human body through the nose, the

mouth, and cuts in the skin. Once inside, these bacteria quickly reproduce and cause illness, called an infection. The infection may result from the bacteria themselves or from their poisonous waste products, called toxins. Luckily, the immune system of the human body can fight these threats.

Sometimes the immune system needs help in fighting off bacteria. Doctors may inject dead or weakened bacteria into the human body. This is called a vaccine. A vaccine prepares the body to fight off the same bacteria in the future. Doctors may also use medicines called antibiotics to kill bacteria in the body.

► More to explore

Antibiotic • Cell • Immune System
• Vaccine

Badger

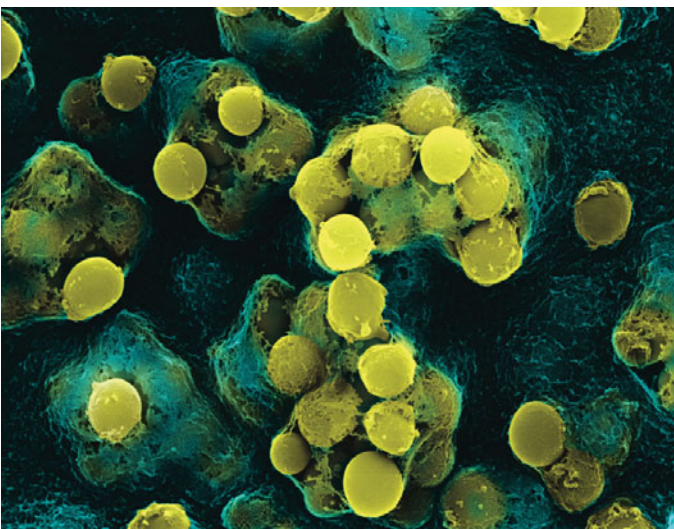
Badgers are mammals known for their powerful digging. They are related to weasels, skunks, otters, and mink.

Badgers live in many habitats, including grasslands and forests. There are eight species, or types, of badger. The American badger lives in the western part of North America. The Eurasian badger can be found in Europe and Asia. The other types live in Southeast Asia. They include hog badgers, ferret badgers, and stink badgers.

Badgers are heavily built animals with short legs. The different species range from 13 to 32 inches (33 to 81 centimeters) long, not including the tail. They

Did You Know?

Scientists have found remains of bacteria that are more than 360 million years old.



Most bacteria are so small that they can be seen only by using a microscope. This bacteria sample has been magnified 2,000 times.

are about 9 to 12 inches (23 to 30 centimeters) high. The American badger sometimes looks wider than it is high. Most badgers have gray or brown fur. Many types have black-and-white marks on the face and back.

Badgers have strong front feet with heavy claws that are excellent for digging. Badgers dig to make underground homes called burrows. They may also dig to find small animals such as squirrels, mice, and rabbits to eat. Many kinds eat insects, lizards, birds, and plants, too. Badgers feed mainly at night.



The American badger is usually found in open, dry areas of western North America. Like other badgers it has large front claws that it uses for digging.

Badgers are strong for their size. They can fight fiercely when threatened. All badgers have scent glands near the tail. Like skunks, stink badgers shoot a foul-smelling liquid from these glands at their enemies.

► More to explore

Mammal • Mink • Otter • Skunk
• Weasel

Baghdad



Population
(2007
estimate), urban
area,
5,054,000

Baghdad is the capital of the Middle Eastern country of Iraq. It is also Iraq's largest city. Baghdad lies on both banks of the Tigris River.

Most of Iraq's industries are located in and around Baghdad. At one time the city produced a wide variety of goods, including cloth, furniture, chemicals, and electrical equipment. The economy of the city was disrupted by wars in the late 20th and early 21st centuries.

People have lived on the site of Baghdad for some 4,000 years. In AD 762 an Arab Muslim ruler moved the capital of his large empire there. Baghdad reached its greatest power in the late 700s and early 800s. It also became a center of learning.

In 1258 the Mongols captured Baghdad. Later several other foreign powers invaded the city.

In 1921 Iraq became an independent country with Baghdad as its capital. The city began to grow again in size and importance.

Iraq's long war with Iran in the 1980s hurt Baghdad's development. During

the Persian Gulf War of 1991, the United States and its allies dropped bombs on the city. Baghdad suffered further damage when forces led by the United States invaded the city in 2003.

► More to explore

Iraq

Baha'i Faith



All Baha'i houses of worship have nine sides and a dome. The House of Worship in Wilmette, Illinois, is the only one in the United States.

In the middle of the 1800s a religion called the Baha'i faith started in what is now Iran. It later spread around the world. Its followers, called Baha'is, seek to bring together all people in one religion.

Beliefs and Practices

Baha'is believe that all religions are one and all people are one. They also believe

that God is beyond understanding. They teach that people should worship God and try to make the world a better place.

At services, members listen to readings from the scriptures of all religions. Baha'is have no priests or special ceremonies. There are rules about prayer and fasting, however. Also, a person is supposed to marry only once and should not use alcohol or tobacco.

History

A man named Mirza 'Ali Mohammad started a group called the Babi in Persia (now Iran) in 1844. He believed that a new prophet, or messenger of God, would soon appear. Muslim leaders and the government opposed his ideas. He was arrested, and in 1850 he was killed.

One of the first Babis was Mirza Hoseyn 'Ali Nuri. After he joined the group, he called himself Baha' Ullah. He was arrested in 1852. While in jail, he realized that he was the new prophet. In 1853 he was released and sent to Iraq. He led the Babi community there. The Babis who believed that he was the new prophet were called the Baha'is.

Baha' Ullah died in 1892. After his death, his oldest son led the group. He helped spread the faith to North America, Europe, and other continents. By the end of the 1900s, it had about 7 million followers around the world.

► More to explore

Iran

Did You Know?

The Baha'i calendar has 19 months of 19 days each because the religion started with 19 followers.



Bahamas, The



Located just southeast of Florida, the country of The Bahamas is a chain of islands in the Atlantic Ocean. The capital is Nassau on New Providence Island.

The Bahamas includes about 700 islands, but people live on only about 30 of them. The islands are low and flat. There are no rivers. The climate is tropical, with warm weather year-round. From July to November, hurricanes may occur.

Forests of pine, broadleaf, and palm trees grow on some islands. Animals of The Bahamas include frogs, lizards, and snakes. The surrounding waters are filled with fish, conchs, crayfish, and other marine animals.

Most people in The Bahamas trace their roots to slaves from West Africa. Smaller groups include mulattos (people with both black and white ancestors), British and U.S. whites, and Haitians.

The economy of The Bahamas depends on tourism. Tourists come to enjoy the beaches and crystal blue waters. Banking is another important industry. Crayfish, poultry, and fruit are the main agricultural products. Bahamians also mine limestone, harvest salt from the sea, and make rum.

The peaceful Arawak people lived on the islands before Europeans arrived. Christopher Columbus landed in The Bahamas in 1492 and claimed the islands for Spain. Within 30 years the Arawak had completely disappeared from The Bahamas.



Many tourists arrive in The Bahamas on cruise ships.

British settlers arrived on Eleuthera Island in 1648. Except for brief control by both the United States and Spain in the late 1700s, The Bahamas stayed British until 1973. That year the islands gained independence.

► More to explore

Arawak • Columbus, Christopher
• Nassau

Facts About THE BAHAMAS



Population
(2008 estimate)
335,000

Area
5,382 sq mi
(13,939 sq km)

Capital
Nassau

Form of government
Constitutional monarchy

Major cities
Nassau, Freeport, West End, Cooper's Town, Marsh Harbour

Bahrain

Bahrain is a small country in the Persian Gulf. It is made up of one main island, called Bahrain Island, and about 30 smaller islands off the coast of Saudi Arabia. The capital is Manama.

Fruit trees grow on the northwestern coast of Bahrain Island. Desert plants grow in the dry areas. Animals include gazelles, hares, lizards, jerboas (desert rats), and mongooses.

The majority of the country's people are Arabs. There are also groups of South Asians and Persians. Arabic is the official language, and Islam is the official religion. Most of the people live in cities.

Bahrain is a center for more than 60 foreign banks. Its major industries depend on its reserves of petroleum (oil) and natural gas. Bahrain also manufactures aluminum products and clothing. Tourism is a growing industry. Agriculture



The desert sun shines down on a mosque in the city of Madinah 'Isa, Bahrain.

tural goods include dates, other fruits, vegetables, eggs, and milk.

Bahrain was likely the site of ancient Dilmun, a trading center in about 2000 BC. Arab Muslims have lived in Bahrain since the AD 600s. Portugal ruled from 1521 to 1602, followed by the Persians. In 1783 the Khalifah family drove out the Persians. A sheikh, or chief, of that family has ruled Bahrain ever since.

Great Britain took control of Bahrain's foreign affairs in the 1800s. Bahrain declared itself independent in 1971. Disagreements between two Muslim groups soon caused problems. About half of Muslims are Shi'ites, but Sunnites hold most of the political and economic power.

► **More to explore**
Arabs • Islam • Manama



Facts About BAHRAIN



Population
(2008 estimate)
1,084,000

Area
277 sq mi (718 sq km)

Capital
Manama

Form of government
Constitutional monarchy

Major urban areas
Manama, Al Muharraq, Ar-Rifa', Madinat Hamad, Madinat 'Isa



Bairiki

Bairiki is the capital of Kiribati, an island country in the central Pacific Ocean. Bairiki is a small coral island. It is part of a group of coral islands called Tarawa Atoll.

Bairiki is a center of government, business, and education for Kiribati. The office of the president and the Parliament building are on Bairiki. The island also has a branch of the University of the South Pacific. Dried coconut meat and other products are shipped from Bairiki's port.



Tarawa Atoll is a long, narrow chain of tiny islands. Bairiki is at the southern end of the chain.

People have lived on Tarawa Atoll for thousands of years. In 1892 the British took over Tarawa and many nearby islands. The Japanese controlled the islands briefly in the 1940s, during World War II. Kiribati became an independent country in 1979. Bairiki became its capital.

► More to explore

Coral • Kiribati

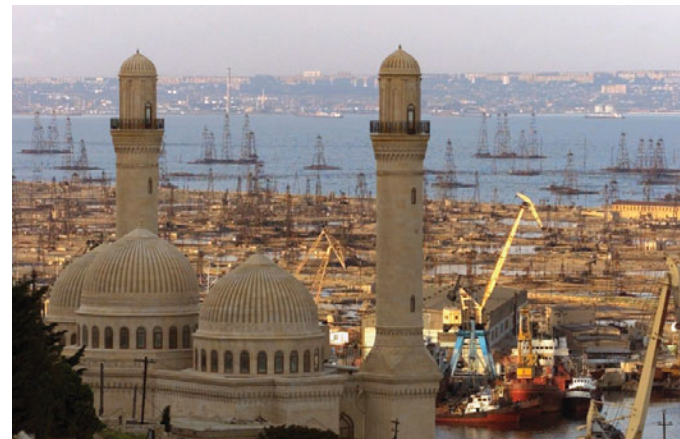
Baku



Population
(2006 estimate)
1,132,800

Baku is the capital and largest city of Azerbaijan, a country of southwestern Asia. The city lies on Baku Bay, which is part of the Caspian Sea. Baku has the best harbor on the Caspian Sea. It is a center of education, culture, and industry.

Petroleum (oil) drilling in the Caspian Sea is a major industry. Processing the petroleum is the basis of Baku's economy. In addition, several factories in the city make equipment for the petroleum industry. Others produce electrical equipment, appliances, cloth, and shoes. Shipping at Baku's port also brings money to the city.



A mosque stands near the Caspian Sea in Baku. In the background is equipment that drills for petroleum in the sea.

People have lived in the Baku area for thousands of years. Oil was first taken from the area in the 900s. Persians ruled the region for many years. Russia captured Baku in 1806. In 1918 Azerbaijan became an independent country with Baku as its capital. The Soviet Union took over Azerbaijan in 1920. Baku became the national capital again when Azerbaijan became independent in 1991.

► **More to explore**

Azerbaijan • Caspian Sea

Balboa, Vasco Núñez de

The Spanish conquistador (conqueror) Vasco Núñez de Balboa was the first European to see the Pacific Ocean. He also helped to found the first successful



Vasco Núñez de Balboa

European colony on the mainland of the Americas.

Balboa was born in Spain in 1475. He left for America in 1500 and settled on the island of Hispaniola, in the West Indies. In 1510 he sailed with a group headed for a colony in what is now Colombia. When they arrived they discovered that the colony had been abandoned except for a few people. Balboa persuaded them to go with him to Darién, in what is now Panama. There they established a stable colony.

Indians told Balboa about a great ocean with gold on its shores. Balboa asked for a large expedition from Spain to search for this ocean, but before it arrived he set out on his own with a smaller group. In September 1513 he reached the Pacific, which he called the South Sea, and claimed it for Spain.

The expedition from Spain arrived in 1514, with Pedro Arias Dávila at its head. Balboa and Dávila competed for power. As governor of Darién, Dávila eventually charged Balboa with various crimes. Balboa was found guilty and beheaded in January 1519.

► **More to explore**

Pacific Ocean

Balkan Peninsula

The Balkan Peninsula is a large piece of land in southeastern Europe. It is divided into many countries, including Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Macedonia,



Moldova, Romania, Bulgaria, Albania, Kosovo, Greece, and the European part of Turkey. Sometimes the region is called the Balkans. The history of the Balkans includes many invasions and wars.

Geography

Mountains cover most of the peninsula. The name Balkan means “mountain” in the Turkish language. The only large lowland regions are plains in Romania and Bulgaria. The Danube River is the most important waterway of the Balkans. The northern part of the peninsula has cold, snowy winters and warm summers. The south has mild winters and hot, dry summers.

People

Many different peoples live in the Balkans. Most of the peoples belong to a larger group called Slavs. The main Slavic peoples include Serbs, Croats, Slovenes, and Macedonians. The other peoples of the Balkans include Romanians, Albanians, Bulgarians, Hungarians, Turks, Germans, and Roma (Gypsies). Each group has its own lan-

guage. Christianity and Islam are the main religions. Religion has been a source of conflict in the Balkans.

History

Peoples called Illyrians, Thracians, and Dacians lived in the Balkans in ancient times. In 229 BC the Romans invaded the peninsula. They controlled the Balkans for many centuries. Christianity spread through the Roman Empire in the 300s AD. In 395 the empire divided in two. The dividing line ran through the Balkans. The western part of the empire was ruled from the city of Rome. The peoples who lived there became Roman Catholics. The east was ruled from the city of Constantinople (now Istanbul, Turkey). The peoples who lived there became Eastern Orthodox Christians. At about the same time different peoples began invading the Balkans from the north. The Slavs were among them. By the 500s the Slavs had spread over much of the peninsula.

The Slavs then started to separate into different peoples. Religion was a major force in those separations. The Slavs who lived in the western part of the Balkans mostly became Roman Catholics. Those who lived in the east mostly became Eastern Orthodox Christians.

Some Balkan peoples created their own kingdoms. The Bulgarians and the Serbs built up empires. But in the late 1300s and 1400s the Ottoman Turks conquered the Balkans. They made the whole region part of the Ottoman Empire. The Turks converted some Slavs and other peoples to Islam.

During the 1800s Balkan peoples formed states that rebelled against the Turks. In 1912 the states of Serbia, Bulgaria, Greece, and Montenegro joined together to defeat the Turks in war. Soon, though, the Balkan states began fighting each other. They disagreed over who should control the land that had been won from the Turks. During World War I (1914–18) the Balkan states were split between the two sides.

After World War I a new Balkan country was created. It combined the Slavic lands of Serbia, Montenegro, Croatia, Slovenia, Bosnia and Herzegovina, and Macedonia. Each became a republic of the new country. In 1929 the country was named Yugoslavia.

For many years after World War II most of the Balkan countries were ruled by strict Communist governments. In 1989 the Communists began to lose power. The Balkan countries then made their governments more democratic.

In 1991 and 1992 Croatia, Slovenia, Macedonia, and Bosnia and Herzegovina broke away from Yugoslavia to form separate countries. That led to fighting that lasted for several years. The two republics that stayed in Yugoslavia were Serbia and Montenegro. In 2003 they dropped the name Yugoslavia. Then, in 2006, Serbia and Montenegro split into separate countries. In 2008 another split occurred. The province of Kosovo declared itself independent from Serbia. Serbia refused to recognize Kosovo as an independent country, however.

► More to explore

Europe • Ottoman Empire • Union of Soviet Socialist Republics • Yugoslavia

Did You Know?

When people say that a region or group is balkanized, they mean that it has been split up into many small units.

Ballet

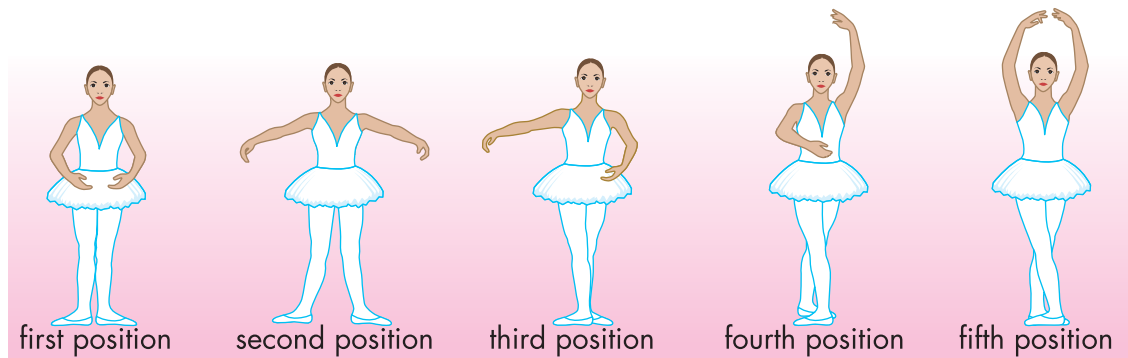
Ballet is a dance form that began in the 1500s. It is a theatrical art, meaning that it is performed to music and with costumes and scenery.

Positions and Steps

Ballet is based on a formal system of poses and steps that have been changed only slightly through the years. There are five basic positions of the feet. In all of them the legs are “turned out,” or rotated from the hips so the feet point outward. The foot positions in ballet are balanced by matching positions of the arms. In addition to the position of the feet and arms, there are two major body positions. In an arabesque one leg supports the body’s weight while the other leg extends backward with the knee



A church stands on an island in the middle of Lake Bled in Slovenia.



Ballet dancers use five basic positions of the feet and arms in all of their dancing.

straight and the foot pointed. In a similar position called an attitude, the knee of the raised leg is bent.

Among the basic steps of ballet are various jumps, turns, and quick gliding or sliding steps. Female dancers, called ballerinas, dance part of the time on the tips of the toes. This often gives their movements a floating quality.

History

Ballet developed from dances performed in the late 1500s for and by members of the French royal court, including the king. These court ballets used many steps of the social dances of the time. In 1661 the French king Louis XIV established the Royal Academy of Dance for the study of ballet. Soon only trained professionals danced in ballets. The academy's first director created the five basic ballet positions. Over the next several decades, its dancers developed many of ballet's basic steps.

Many early ballets combined dancing with opera or scenes from a play. The dramatic ballet, which tells a story through dance, was developed in the 1700s. Choreographers (who create a

dance's steps and movements) and dancers of the time also began to use new, more expressive steps and gestures.

In the mid-1800s French dancer and choreographer Marius Petipa moved to Russia and established Saint Petersburg as the major center for ballet. Petipa and composer Peter Ilich Tchaikovsky created several famous ballets, including *Swan Lake*, *Sleeping Beauty*, and *The Nutcracker*.

In the early 1900s Sergey Diaghilev founded a company called the Ballets Russes. Among his associates were famous composers and artists and such great choreographers and dancers as



Dancers perform the ballet *Swan Lake*.

Michel Fokine, Léonide Massine, Vaslav Nijinsky, Anna Pavlova, and George Balanchine. The Ballets Russes toured widely and greatly influenced dancers in the West. Many of its artists later moved to the United States.

Balanchine founded what became the New York City Ballet in the 1940s. He choreographed more than 150 works for the company, several featuring music by Igor Stravinsky. The company that became the American Ballet Theatre began performing in 1940. It is also based in New York City.

Other great companies, such as the Royal Ballet of England and the Royal Danish Ballet, also flourished in the 1900s and beyond. In Russia the Bolshoi Ballet in Moscow and the Kirov Ballet in Saint Petersburg continued to uphold the highest standards.

► More to explore

Dance

Balloon

Like airships, balloons are lighter-than-air craft. They are filled with a gas or heated air that makes them float in the air. Early experiments with balloon flight led to the development of the motor-powered airship and later the airplane.

Types of Balloons

Balloons come in all shapes and sizes, from small toy balloons to large passenger balloons. They can be used for advertising purposes, for scientific



Balloons are popular features of many parades.

experiments, for entertainment, or for recreation. Giant balloons of cartoon characters and other entertaining subjects are familiar sights in parades. These are controlled by people on the ground, who carry them along the parade route. Scientific balloons and those used for recreation are free to move through the air as they are guided by a pilot.

How Balloons Fly

A balloon rises because it is filled with a gas that is lighter than air. The lightest gas is hydrogen. Hydrogen, however, catches fire and explodes easily. Helium is almost as light as hydrogen, and it does not burn. Helium is used for balloons that are held down with ropes, such as the ones seen in parades. Some free passenger balloons are also filled with helium or with hydrogen. Others are filled with heated air, which is lighter than unheated air. For long-distance

balloon flights a combination of helium and hot air is used.

A free passenger balloon has a huge gas bag, or envelope. It is filled through an opening at the bottom, called the neck or appendix. In a hot-air balloon, a propane burner at the neck keeps the air inside the bag hot. The entire bag is enclosed in a strong net. A basket is attached to the net and hangs underneath the bag. This holds the passengers. At the top of the bag is a valve for releasing gas. This valve is connected to a cord that usually runs through the bag and out the neck. It hangs within reach of the person operating the balloon. Bags of sand are hung around the basket for ballast, or extra weight, so that the balloon does not rise too fast.

The balloon rises gently after the cables holding it on the ground are unhooked. The movement of the balloon is largely



Colorful hot-air balloons soar above Albuquerque, New Mexico.

controlled by the wind. The main control the balloonist has is to move the balloon up and down. As ballast is thrown overboard, the balloon rises. As gas is released through the valve, the balloon drops.

History

Joseph-Michel and Jacques-Étienne Montgolfier were two brothers who lived in France. They made the first successful experiments with hot-air balloon flights in 1783. The first balloon passengers were a sheep, a rooster, and a duck, but soon afterward two men sailed for 5.5 miles (9 kilometers) over Paris.

Soon others began experimenting with balloons. Some people focused on the sport of trying to make longer and longer flights. Others saw balloons as useful tools, especially during wartime. During the American Civil War and World War I, armies used balloons to spy on their enemies. Today scientists send tools up in balloons to gather information about the weather and the upper atmosphere.

Free balloons are still used for sport and adventure. In 1999 Bertrand Piccard and Brian Jones became the first balloonists to complete a nonstop voyage around the world. Three years later U.S. adventurer Steve Fossett became the first person to complete the trip alone. In Albuquerque, New Mexico, and other locations there are annual hot-air balloon festivals featuring hundreds of colorful balloons.

Baltic Sea



An arm of the Atlantic Ocean, the Baltic is a shallow sea in northern Europe. For a sea, the Baltic does not have very salty water. Several rivers, including the Oder and the Vistula, drain into the sea. The huge flow of fresh river water keeps the Baltic from getting too salty.

The Baltic Sea lies between the Scandinavian peninsula and the rest of Europe. It covers an area of about 149,000 square miles (386,000 square kilometers). The countries that border the Baltic are Sweden, Denmark, Russia, Finland, Estonia, Latvia, Lithuania, Ger-

many, and Poland. The coasts of Sweden and Finland are generally rocky, but the coasts on the southern Baltic are flat. The Baltic coastline of Germany has a lot of bays and shallow inlets called fjords. Canals link the Baltic to the North Sea and the Arctic Ocean.

The countries around the Baltic use the sea for trade. The chief ports are Copenhagen, Denmark; Stockholm, Sweden; Helsinki, Finland; Saint Petersburg, Russia; and Gdansk, Poland.

The Vikings were the first to trade on the Baltic, in the AD 700s. During the Middle Ages, German merchants of a group called the Hanseatic League controlled trade on the sea. As the countries around the sea prospered, the area became more developed. By the middle of the 1900s pollution from industries and farms was a concern. In the 1990s the Baltic countries agreed to clean up the environment in and around the sea.

► More to explore

Atlantic Ocean

Bamako



Population
(2007
estimate), urban
area,
1,494,000

Bamako is the capital of the West African country of Mali. The city is also



A small town in Sweden is set in the rocky coast of the Baltic Sea.

Mali's center for industry and trade. Bamako spans both sides of the Niger River. Large boats can travel on the river for part of the year, when the water level is high. The river is used to ship products and for fishing.

At first Bamako was a settlement of only a few hundred people. In 1880 the French took it over. Bamako became the capital of a colony called French Sudan in 1908. When the area became the country of Mali in 1960, Bamako became its capital.

► More to explore

Mali

Bamboo

Bamboo is a name used for many types of tall, treelike grasses. There are hundreds of different species, or types, of bamboo in the world. They grow in mild to warm and humid areas. Most are in Asia and on islands of the Indian



Many types of bamboo look like trees, but they are actually tall grasses.

and Pacific oceans. A few types grow naturally in the southern United States.

The stems of bamboo are called culms. They vary greatly in size. The smallest types are 4 to 6 inches (10 to 15 centimeters) tall. In the largest species the culms can be more than 130 feet (40 meters) tall. Culms are hollow and grow in clusters from an underground stem called a rhizome. Some grow as much as 1 foot (0.3 meter) per day.

Bamboo is used for a variety of purposes, especially in Asia. In some countries, the seeds are eaten as grain, or the young shoots are cooked and eaten as vegetables. Cattle eat the leaves. Some types of bamboo are crushed to make paper. The stems of other types are tied together and used as rafts. They are also used to form scaffolding, or a framework on building construction sites. Bamboo stems are also used to make buckets, pipes, furniture, walking sticks, fishing poles, garden stakes, chopsticks, and other utensils.

Banana

Bananas are one of the most important and popular foods in the world. They are a flavorful fruit that is full of vitamins. They can be found in stores throughout the year.

Where Bananas Grow

Scientists believe that bananas first grew in the tropics in Asia. Over the years they spread to other humid tropical places. Today people grow bananas in



Bananas grow in clusters on a banana plant.

Africa, Asia, Central America, and South America.

Physical Features and Growth

Bananas grow on a banana plant. Although it is often called a tree, the banana plant is really a large herb. That means it does not have a woody trunk like a tree. Instead the banana plant has a stalk that looks like a tree trunk. The stalk grows from an underground stem.

The banana plant can be more than 20 feet (6 meters) tall. Large leaves grow near the top. These leaves are 9 to 12 feet (3 to 3.5 meters) long. Each plant produces 50 to 150 bananas. The bananas grow in clusters of 10 to 20. The bananas are usually chopped down while green and unripe.

A banana plant only produces one bunch of fruit. After the bananas have been picked, the plant is cut down. In

six months new shoots grow from the underground stem.

There are hundreds of types of banana. One of the most popular is the common banana. Its fruit is yellow and sweet when ripe.

Uses

Bananas contain the mineral called potassium. They are also a good source of vitamins A and C. Bananas are usually eaten fresh. However, they can be used in pies, muffins, cakes, or breads. The plantain is a close relative of the common banana. It is always cooked before being eaten.

► More to explore

Fruit • Herb

Bandar Seri Begawan



Population
(2001 census),
city, 27,285;
(2004
estimate), urban
area, 81,500

Bandar Seri Begawan is the capital of Brunei, a country in Southeast Asia. It is also Brunei's largest city. The city has a port on the Brunei River. Ships can travel from the port to the South China Sea. Bandar Seri Begawan is a center for the trade of farm products. It also has



A mosque in Bandar Seri Begawan is set in an artificial lake.

factories for processing Brunei's rich reserves of oil and natural gas.

A water village probably existed in the region as early as the 600s. The modern city became the capital of Brunei in 1920. Bombing during World War II (1939–45) destroyed most of the city. But after the war the city was rebuilt.

► More to explore

Brunei

Bangkok



Population
(2007 estimate)
6,704,000

Bangkok is the capital of Thailand, a country of Southeast Asia. It is Thailand's largest city by far. Bangkok is a center for government, education, cul-

ture, and business. It is also Thailand's main port. The city lies on both banks of the Chao Phraya River.

More than 300 groups of Buddhist temple buildings, called *wats*, are found throughout Bangkok. They are centers of the city's religious and cultural life.

Factories in Bangkok process foods and make cloth, building materials, and electronics. Rice, tapioca, rubber, sugarcane, and other products are shipped from the city's port. Tourism is also important to the economy.



Merchants sell fruits, vegetables, and other items from boats at a floating market in Bangkok.

In 1782 Bangkok became the capital of the kingdom of Siam, which is now Thailand. Railways, electricity, and other improvements made the city more modern in the 1800s and early 1900s. Bangkok began to grow rapidly in the second half of the 1900s.

► More to explore

Thailand

Bangladesh

Bangladesh is a country in south-central Asia. It is one of the most crowded countries in the world. Although 92 countries are larger than Bangladesh, only seven have more people. Dhaka is the capital.

Geography

Bangladesh is surrounded by India and Myanmar. The Bay of Bengal lies to the south. The country's many rivers include the Ganges (known as the Padma in Bangladesh), the Brahmaputra (known as the Jamuna in Bangladesh), the Tista, the Meghna, the Surma, the Karnaphuli, the Sangu, and the Matamuhari.

Bangladesh has a tropical monsoon climate. This means that it has heavy rains and high temperatures during the summer. Damaging floods occur every two or three summers. In 1991 a cyclone killed more than 100,000 people. The winters, however, are dry and cool.

Plants and Animals

Forests cover about one sixth of Bangladesh. Plant life includes groves of mango, jackfruit, bamboo, betel nut, coconut, and date palm trees. The country's animals include elephants, royal Bengal tigers, langur monkeys, leopards, and black bears. About 750 types of bird nest in Bangladesh, and snakes are also common.

People

Almost 98 percent of the people are Bengalis. They speak Bengali, the state language. West Bengal, a neighboring state of India, shares the Bengali culture.

Islam is the main religion in Bangladesh. Followers of Islam, called Muslims, make up about 86 percent of the population. About 12 percent of the people are Hindus. The rest are mostly Buddhists and Christians.

Economy

Bangladesh is a poor country. Most of the people live in rural areas and make their living by farming. The main crops are rice, sugarcane, potatoes, wheat, jute, bananas, sweet potatoes, oilseeds, mangoes, and tea. Goats and cattle are the main livestock.

Bangladesh is one of the world's largest producers of jute fibers. These fibers are





A fishing boat sails on the Meghna River in Bangladesh.

Facts About BANGLADESH



Population
(2008 estimate)
142,547,000

Area
56,977 sq mi
(147,570 sq km)

Capital
Dhaka

**Form of
government**
Republic

Major cities
Dhaka, Chit-
tagong, Khulna,
Rajshahi

used to make fabric and twine. Manufacturers also make clothing, shoes, tobacco and food products, chemicals, and iron and steel.

History

Bangladesh is part of a historic region called Bengal. From the 700s to the 1100s Buddhist and Hindu kings ruled Bengal. Muslims invaded in about 1200. The region remained largely independent until the 1600s. Then the Mughal Empire, which controlled India at the time, made Bengal one of its provinces. The British took control of all of India in the 1700s. They ruled the area as a colony until 1947.

After the British left, the colony of India was divided into two independent countries: India and Pakistan. India lay between Pakistan's two provinces—East

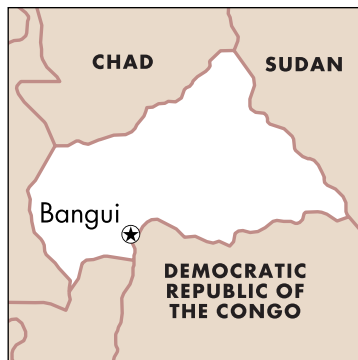
Pakistan (now Bangladesh) and West Pakistan (now Pakistan). The people of East and West Pakistan spoke different languages and had different cultures. The provinces struggled for power. War broke out in 1971. About 1 million Bengalis were killed, and millions more fled to India. India helped East Pakistan defeat West Pakistan. Then East Pakistan became the independent country of Bangladesh.

Bangladesh held its first national election in 1973, but the military soon took over the government. Beginning in 1991 Bangladesh held a series of free elections. However, the elections often led to protests and violence over the results.

► More to explore

Dhaka • Ganges River • India • Islam
• Pakistan • Tiger

Bangui



Population
(2003 census)
622,771

Bangui is the capital and largest city of the Central African Republic, a country in the middle of Africa. The city is located on the Ubangi River.

Bangui is the country's main port. Rivers and railroads connect it with other cities and to the West African coast. Bangui is also the country's largest city and center for manufacturing and business. The city has a university as well.

The French built a fort in the area in 1889 to help them take control of central Africa. Bangui grew up around the fort. The city later became the capital of the French colony in the area. In 1960 the Central African Republic became independent from France. Bangui became the new country's capital.

Different groups tried to take over the government of the Central African Republic in Bangui several times in the late 20th and early 21st centuries. Bangui was then the site of power struggles, riots, and looting.

► **More to explore**
Central African Republic

Banjul



Population
(2003 estimate),
city, 34,800;
metropolitan
area, 523,600

Banjul is the capital of the West African country of The Gambia. The city lies on Saint Mary's Island in the Gambia River. It is the largest city in the country.

Banjul is The Gambia's center for business and transportation. The city's factories process peanuts and peanut oil. These and other products are shipped to other countries from Banjul's port. Tourism also brings money to the city.

The city dates from 1816, when the British set up a fort and trading post on the site. They named the settlement Bathurst. The British used the fort to force an end to the slave trade on the



Workers stack bags of peanuts in a warehouse in Banjul.

western coast of Africa. In 1965 The Gambia became an independent country with Bathurst as its capital. The city was renamed Banjul in 1973.

► More to explore

Gambia, The

Bank and Banking



Young people can open a savings account at a bank with the help of a parent or another relative.

A bank is a business that borrows and lends money. It borrows money from customers called depositors. It lends money to other customers called borrowers. It pays fees to the depositors and collects fees from the borrowers. The fees are called interest. The bank makes a profit by collecting more interest than it pays out. Modern banks do many other things for their customers as well.

Bank Accounts

A person who has money deposited in a bank is said to have a bank account. One kind of bank account is called a checking account. A person with a checking account can write checks to pay for things. A check is an instruction to the bank to pay out money from that person's account. People can also use a plastic card, called a debit or check card, to pay out money from their checking accounts. Checking accounts pay little or no interest to the depositor. People use them because they are a safe and convenient way to handle money.

Another kind of bank account is a savings account. People keep money in savings accounts in order to earn interest. The bank pays a certain amount of interest for every dollar that someone has in their savings account.

A bank keeps only part of the money in its accounts as cash. It uses the rest to lend to other people and to make investments. It keeps track of all this money in computers.

Lending and Other Services

People and businesses often borrow money from banks. The money they borrow is called a loan. They pay the loan back with interest. They usually pay in monthly portions called installments. If the borrower does not repay, the bank may take away the thing—a car, for example—that the loan paid for.

Modern banks provide other services as well. Some banks sell insurance, provide help with taxes, and handle investments



Some aid agencies operate small banks and credit unions to help people in developing areas. They loan money to people to start small businesses.

in stocks and bonds. Many banks issue credit cards and send monthly bills to the people who use them. Banks also maintain automated teller machines, or ATMs. Bank customers can use the ATMs to withdraw money from their accounts or to make deposits.

Types of Banks

The banks most people use are called commercial banks. Other kinds of banks do special things. Investment banks sell stocks and bonds. Credit unions make loans to workers. Savings banks and associations make loans to home buyers. Central banks—such as the Bank of England or the banks of the U.S. Federal Reserve System—are responsible for their country's money. International banks lend money to developing countries.

History

There was banking in ancient Mesopotamia at least 4,000 years ago. The first bankers kept gold and silver for people and also lent it out. In ancient

Greece and Rome there were companies very much like modern banks.

Florence and Venice, two cities in Italy, became banking centers in the 1400s. In England gold dealers served as bankers until the Bank of England was founded in 1694.

Many people in the United States did not want the U.S. government to control banking. The central Bank of the United States closed in 1836. But in 1913 the U.S. government set up the Federal Reserve System. This system oversees U.S. banks today.

Many banks failed during a period known as the Great Depression that started in 1929. Depositors at these banks lost their money. To protect depositors, the U.S. Congress set up the Federal Deposit Insurance Corporation (FDIC) in 1933. The FDIC gives depositors money if their bank fails.

Today banks use computers for nearly all their business. Customers often use their home computers for banking, too.



A woman uses an automated teller machine in Shanghai, China.



An illustration from the 1400s shows people using a bank in the city of Florence.

People can pay bills or transfer money between their bank accounts over the Internet.

► More to explore

Money

Banneker, Benjamin

A man of many talents, Benjamin Banneker was one of the first distinguished African American scientists and mathematicians. He was also an inventor and a writer.

Banneker was born on November 9, 1731, in Ellicott's Mills, Maryland. His father had been a slave, but Benjamin was free. Although he had little schooling, he grew up with a love of book learning.

Banneker attracted attention in his early 20s by designing and building a wooden

clock. It was the first clock of its type to be built in what is now the United States.

Banneker taught himself astronomy and in 1791 began to publish a yearly almanac. In it he tracked when the sun, Moon, and stars would appear in the skies on every day in the coming year. His almanacs were praised by European scientists. Banneker also wrote essays and pamphlets arguing against slavery and war.

In the 1790s Banneker helped to lay out the new national capital of Washington, D.C. When the city plans were lost, Banneker was able to reproduce them from memory. He died in Baltimore, Maryland, on October 25, 1806.

► More to explore

Astronomy • Washington, D.C.



A U.S. postage stamp honors African American scientist Benjamin Banneker.

Barbados

The island country of Barbados lies at the eastern end of the West Indies, a group of islands in the Caribbean Sea. A longtime British colony, Barbados still shows the influence of British culture. Bridgetown is the capital and largest city.

Coral reefs surround Barbados. The surface of the island is also made of coral, which lies over rocks. There are no rivers or lakes and few hilly areas. Barbados has a moderate tropical climate with wet and dry seasons.

The most common plant on Barbados is sugarcane, which is grown on large plantations. Trees include mahogany and cabbage palm. Monkeys, hares, mon-gooses, and egrets are common animals. Green dolphins, barracudas, and parrot fish live in the surrounding waters.

Barbados is a densely populated island. About half of the people live in cities or towns. Most Barbadians have African



ancestors. Smaller numbers of people have mixed, British, U.S., or Asian ancestry. English is the official language of Barbados. Some people speak a form of English called Bajan. Most of the people are Christians.

The economy of Barbados is based on tourism and on the production of sugar and rum. Finance and other services are also important. Manufacturers make chemicals, paper, and metal products.

Arawak people may have lived on Barbados when the Spanish visited the island in the early 1500s. The English settled there in 1627. They built sugar plantations and brought slaves from Africa to work on them. Great Britain ruled the island until 1966. Barbados then became an independent country.

► More to explore

Bridgetown • Coral • West Indies



Facts About BARBADOS



Population
(2008 estimate)
282,000

Area
166 sq mi (430 sq km)

Capital
Bridgetown

Form of government
Constitutional monarchy

Major cities
Bridgetown, Speightstown



A market that sells souvenirs to tourists is located near a boat docking area in Barbados.

Bark



Bark helps protect trees from people, animals, and weather.

Bark is the outer layer of the trunk of a tree. Trees have an inner and an outer layer of bark.

The inner layer of bark is alive and continues to grow as the tree grows. It contains a tissue called phloem. Phloem carries the food that is made in the leaves to all the other parts of the tree.

The outer layer of bark is dead. As the living bark grows, it pushes outward and later dies. It then becomes the rough bark that is seen on the trunk of a tree.

Even though the outer layer of bark is dead, it is still very useful to the tree. It helps to keep water in the tree from escaping. It also protects the tree from injury by people, animals, and weather. In addition, the outer bark helps to keep out living things such as germs and fungi, which can cause diseases.

► More to explore

Tree

Barley

Barley is a valuable grain. Grains are grasses that produce seeds that can be eaten. Barley seeds are called kernels or barleycorns.

Barley was probably first grown in Ethiopia and Southeast Asia in ancient times. Today Russia, Canada, and Germany are leading barley producers.

A barley plant grows to about 1 to 4 feet (0.3 to 1.2 meters) tall. It has a thin stem and long, narrow leaves. At the ends of the stems are structures called spikes, which produce small flowers. The flowers develop into kernels. Each spike produces two to six rows of kernels, depending on the type of plant.

About half of the world's barley is used to feed livestock. The rest is used for human foods and for malting. Malted barley is soaked in water and then dried



Kernels of barley grow in neat rows.

with hot air. It is used mostly to make beer. A type called pearl barley is common in hot cereal and soups. Barley is also ground into flour and used to make flatbread and porridge, which is like oatmeal. The stems of barley plants are used as bedding and food for farm animals.

► More to explore

Grain • Grass

Barracuda

Barracudas are among the fiercest fish in tropical waters. They circle around groups of smaller fish until the fish huddle together in fear. The barracudas then dive in and slash the fish with their teeth. The species, or type, called the great barracuda will sometimes even attack human swimmers.

There are about 20 species of barracuda. They live in warmer parts of the Atlantic and Pacific oceans, including the Caribbean Sea. Fishers often catch them for sport and food. But barracudas that live in some seas can be poisonous.

Barracudas have long mouths filled with large, knifelike teeth. Their slender,



Barracuda

powerful bodies help them swim fast. They have two fins on the back and small scales on the body. Barracudas average about 3 to 4 feet (1 meter) in length. The great barracuda can reach a length of 8 feet (2 meters).

Barracudas travel far in search of food. They eat mainly smaller fish, such as mullets, anchovies, and grunts.

► More to explore

Fish

Barton, Clara

Clara Barton was called “the angel of the battlefield” for her work tending to wounded soldiers in the American Civil War. Later she organized the American Red Cross to aid the victims of all wars and disasters.

Clarissa Harlowe Barton was born on December 25, 1821, in Oxford, Massachusetts. She was educated at home. As a young woman she taught school in Massachusetts and New Jersey.

When the American Civil War began in 1861, Barton heard that Union (Northern) soldiers were suffering and dying because there were not enough bandages and other medical supplies. She organized a private agency to buy supplies. Starting in 1862 she herself worked as an unpaid nurse, aiding the wounded where they fell. After the war she led an effort to track down missing soldiers.

Did You Know?

Clara Barton helped the United States to agree to the Geneva Convention. The convention was an agreement that protected wounded soldiers.



Clara Barton

Some people in Europe also wanted to help soldiers wounded in battle. In 1863 these people founded the International Red Cross. In 1870, while Barton was staying in Europe, a war broke out between France and Germany. Barton tended the wounded under the Red Cross banner. She also studied how the organization worked.

Barton returned home in 1873 and worked to organize a branch of the Red Cross in the United States. She succeeded in 1881. Barton was head of the American Red Cross for 23 years. She expanded the mission of the organization to include helping victims of disasters in peacetime as well as in war. In 1904 Barton retired. She died on April 12, 1912.

► More to explore

American Civil War • Red Cross and Red Crescent

Base

► see Acid and Base.

Baseball

The sport of baseball has been called the national pastime of the United States. Each spring millions of fans look forward to the beginning of a new baseball season. Baseball is also popular in many Latin American and Asian countries, especially Japan. The game is played with a bat and a fist-sized ball. Two teams of nine players compete against each other. The goal is to score the most points, which are called runs.

Playing Area and Equipment

A baseball field is divided into an infield and an outfield. Within the infield is a square area called the diamond. There are four bases, one on each corner of the diamond. One base is called home plate. The others are called first, second, and third base. The bases are 90 feet (about 27 meters) apart. The outfield is a grassy area beyond the infield. A wall usually marks the outer boundary of the outfield.



A Boston Red Sox player bats during the 2004 World Series against the Saint Louis Cardinals.

A raised, circular mound is located in the middle of the infield diamond. A player called the pitcher throws the ball toward home plate from a spot on the mound. The spot is known as the rubber. In professional baseball the rubber is 60 feet, 6 inches (18.4 meters) from home plate.

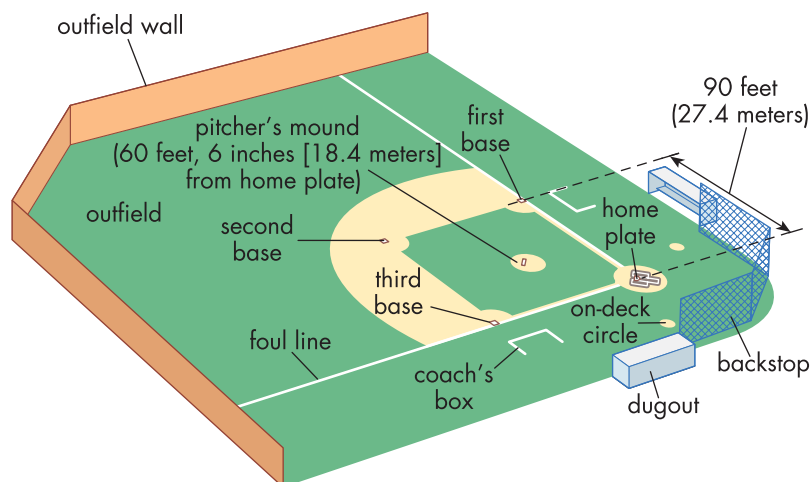
A baseball has a core made of cork and rubber. Yarn is wrapped around the core. The cover is made of two strips of white leather that are sewn together. Players hit the ball with a bat. A baseball bat is a smooth, rounded stick made of wood or aluminum. To catch the ball, players wear leather gloves.

Playing the Game

The two teams in a baseball game take turns being batters (playing offense) and fielders (playing defense). The batting team, also called the team at bat, tries to score runs. It does this by advancing its players around the bases. The fielding team tries to prevent the batting team from scoring.

Play begins when the fielding team's pitcher throws, or pitches, the ball toward home plate. A batter tries to hit the pitched ball, called a pitch, out of the reach of the fielders. The fielding team tries to get the batters out. When a batter is called out his turn at bat is over.

The pitcher can get a batter out by throwing three strikes. This is called a strikeout. An umpire behind home plate calls each pitch either a strike or a ball. A strike is a pitch that passes through the strike zone. The strike zone



Baseball fields do not all look the same, but they all have certain features in common.

is an imaginary rectangular box above home plate. From bottom to top, it extends from the batter's knees to about the middle of his chest. The umpire calls a strike if the batter fails to swing at a pitch thrown in the strike zone. The batter also gets a strike for swinging at the ball and missing.

If a pitch is outside the strike zone and the batter does not swing, the umpire calls a ball. If the umpire calls four balls during a batter's turn at bat, the batter receives a walk. A walk lets the batter go to first base. The batter also goes to first base if a pitch hits him.

If the batter hits the ball onto the field, he tries to run to first base or farther without making an out. The fielders can get the batter out in a variety of ways. For example, they can catch a hit ball before it bounces. They can also scoop up the ball and throw it to first base before the batter gets there. With the ball in hand, a fielder may also tag the

batter out. If the batter safely gets to first base or farther, he is said to have gotten a hit.

After a batter reaches a base, he becomes a base runner. He tries to advance from base to base around the diamond. Usually he does this as the next batters get hits of their own. The batting team scores a run when a base runner goes all the way around the bases and returns to home plate.

After three batters have made outs, the fielding team takes its turn at bat. A period of play called an inning is completed after both teams have batted. After nine innings, the team with the most runs wins. If a game is tied, the teams play extra innings until the tie is broken.

History

Historians once thought that Abner Doubleday, a U.S. Army officer, invented baseball in 1839 in Coopers-town, New York. Now, though, most historians agree that baseball developed from an English game called rounders. English children played rounders in the 1700s. The game was quite similar to modern baseball. It had nine-member teams and a diamond-shaped infield with bases on the corners.

In 1845 Alexander Cartwright organized the Knickerbocker Base Ball Club in New York City. The club was made up of amateur players (players who were not paid). The club put together a set of rules for playing the game. Many of those rules are still used today.

In 1869 the Cincinnati Red Stockings began to pay players. The Red Stockings are considered to be the first professional baseball team. Two years later nine teams formed the first professional baseball association. In 1876 the National League was formed. The American League was founded in 1900 as a rival to the National League.

Today the National and American leagues are combined in the organization called Major League Baseball. As of 2006 there were 30 professional teams divided between the two leagues. Since 1903 the best teams from each league have competed in a championship called the World Series.

Amateur baseball is played in high schools and colleges. Younger children play baseball in the Little League system.

Did You Know?

The Cleveland Spiders of 1899 had one of the worst major league baseball seasons ever. They won 20 games and lost 134.



African Americans were not allowed to play in baseball's major leagues until 1947. Jackie Robinson was the first African American to join a team. In 1949 Roy Campanella, Larry Doby, Don Newcombe, and Robinson (from left) were the first to play in an All-Star game.

Each year the two best teams compete in the Little League World Series.

Basho



A woodblock print from the 1800s shows Basho standing and talking to two others.

Basho was one of the most important poets of Japan. He is considered the master of the haiku, a type of poem that has only three lines.

Basho's original name was Matsuo Manefusa. He was born in 1644 near Kyoto, Japan. Basho was a member of the samurai, a class of warriors. He worked for a landowner, and the two men wrote poetry together.

After the landowner died in 1666, Basho devoted himself to writing. He published his first poems in 1671 and soon began attracting students and admirers. In 1680 his students built him a house. They planted a basho, or

banana plant, in the yard. That plant was the source of his pen name.

Basho forever changed Japanese poetry. Earlier haiku were playful and silly. But Basho wrote serious artistic haiku. Many of his poems were about nature. Soon other poets began copying his style. Basho also became known for his poetic diaries. He wrote them during four long journeys he took on foot across Japan. The diaries include descriptions of the places he visited, his thoughts, and many short poems. The most famous is *The Narrow Road to the Deep North*. Basho died while on a journey in 1694.

► More to explore

Japan • Poetry • Samurai

Did You Know?

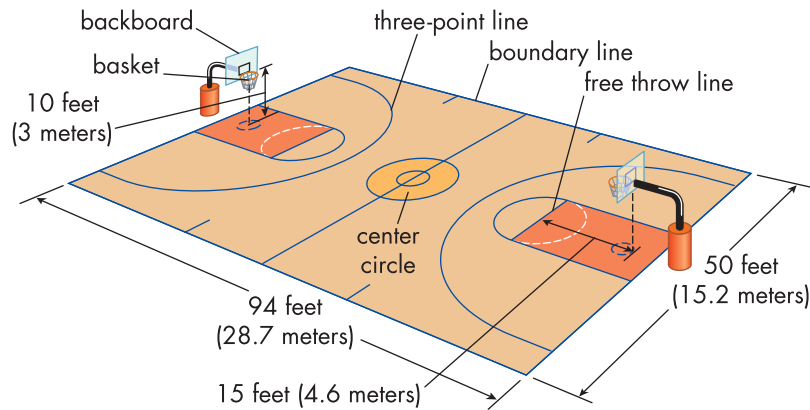
A haiku is a very short poem. It has three lines that have five, seven, and five syllables each.

Basketball

Basketball is a fast-paced and exciting sport. It is very popular in the United States, where it began in the 1890s. It has also become popular in many other countries. In a basketball game two teams of five players compete. The goal is to score more points than the other team. Players score by tossing, or shooting, a ball through a raised goal called a basket.

Playing Area and Equipment

Basketball is played on a rectangular court. A professional basketball court is 94 feet (28.7 meters) long and 50 feet (15.2 meters) wide. High school and international courts may be slightly smaller.



Every U.S. professional basketball court has the same dimensions.

Each end of the court has a basket. The basket is a metal ring with a net hanging from the rim. It is attached to a backboard, which is usually made of strong glass. The rim of the basket is 10 feet (3 meters) above the floor of the court. A basketball is round and full of air, which makes it bounce well.

Playing the Game

A basketball team has five players: two forwards, two guards, and a center. The players are named for the different positions, or roles, that they play on the court. In general, the players at each position have special abilities and duties. For example, guards usually excel at moving the ball down the court and passing it to teammates.

Basketball players play both offense and defense. When a team has the ball, it is on offense and tries to score points. The other team plays defense—it defends the basket at its end of the court. The defensive team tries to keep the other team from scoring. It also tries to gain control of the ball by taking it away from the offensive team.

Play begins with a jump ball. A referee tosses up the ball between two opposing players in the middle of the court, inside a circle called the center circle. The two players jump for the ball and try to tap it to a teammate. The other players stand outside the center circle, ready to catch the ball. The team that gets control of the ball plays offense first.

The offensive team tries to advance the ball toward the defensive team's basket. Offensive players can pass the ball to teammates. They can also move the ball down the court by themselves. However, players cannot run freely with the ball. They must dribble, or bounce, the ball on the court as they run with it.

Any player with the ball may take a shot at the basket. Most successful shots score two points. Very long shots, from behind a line called the three-point line, score three points.

The defensive team tries to keep the offense from getting a good shot at the basket. When a shot is missed, both teams try to recover the ball. This is called rebounding. If the offense gets the



As one player tries to get the ball in the basket another raises his hand to try to stop him.

ball on the rebound, it can try to take another shot. If the defense gets the rebound, then it becomes the offense. It tries to move the ball down the court to the opponent's basket. The defense can also get the ball by taking it away, or stealing it, from the offense. Defenders can make a steal when the offense is passing or dribbling the ball.

A group of officials makes sure that the players follow the rules. The officials penalize a team when one of its players breaks a rule. For example, if an offensive player runs without dribbling the ball, the officials give the ball to the defense. Some penalties are called fouls. Most fouls happen when one player makes physical contact with another player. For example, officials call fouls for bumping, pushing, and tripping. The player who is fouled often gets to take shots without having to worry about the defense. These shots are called free throws. They score one point.

History

James Naismith invented basketball in 1891. Naismith was a physical education teacher in Springfield, Massachusetts. His school asked him to create a sport that students could play indoors during the winter. The first basketball game had peach baskets as the goals. That is why the sport was named basketball. The metal hoop was not invented until 1906.

Basketball quickly became popular throughout the United States. Both men and women started playing basketball at the college level in the early 1890s. The first professional basketball league in the United States was formed in 1898. The National Basketball Association (NBA) started in 1949. It is the main professional league in the United States today.

Outside the United States, basketball developed more slowly. Men's basketball became an Olympic event in 1936. International world championships began in 1950 for men and in 1953 for women. Women's basketball was added to the Olympics in 1976.

The NBA grew especially popular in the 1980s. More games were televised than ever before. Outstanding players such as Magic Johnson, Larry Bird, and Michael Jordan attracted many new fans.

The first women's professional leagues in the United States began during the 1970s. They failed after a year or two. The current Women's National Basketball Association (WNBA) began in 1997.

Did You Know?

James Naismith's original rules of basketball did not allow players to run with the ball. They had to throw it from the spot where they caught it.



Basketball is a very popular sport at the college level for both men and women.

High school and college championship tournaments are traditionally held in March. There are separate tournaments for both men's and women's teams.

► More to explore

Johnson, Magic • Jordan, Michael

Basque

The Basques are a people with a unique history and culture. Most Basques live in northern Spain, but some live in southern France. They have lived in this region for many hundreds of years. Some Basques have moved away from Europe, mostly to South America and the United States.

The Basques have a unique language called Euskara. It is unlike any other European language. Some Basques who

live in the mountains still speak Euskara. However, most Basques speak either Spanish or French.

The Basques traditionally were farmers. They also sailed far over the Atlantic Ocean to fish and hunt whales. In more recent times they have built large industrial towns. Their factories make lumber, furniture, iron, and steel.

For many years some Basques living in Spain have not liked being under Spain's control. They have worked to get more control over their region. In 1978 the Spanish government gave the Basques in Spain some of the freedom they wanted. For example, the Basques won the right to make their own laws.

However, some Basques want to break away from Spain completely. Their goal is to form an independent Basque nation. Some of these Basques belong to a terrorist group known as the ETA.



People carrying Basque flags attend a rally for Basque independence held near Bilbao, Spain.

They have killed Spanish officials and performed other acts of violence.

► More to explore

France • Spain

Bass

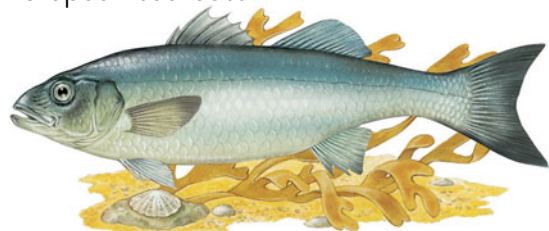
The fish called bass are valued all over the world as a source of food. There are hundreds of different species, or types, of bass. Many of them belong to the sea bass family. Others, such as black bass, belong to the sunfish family. Some fish in other families are also called bass.

Most bass have a spiky fin running along their back. Many are dark on top with a pale belly. Bass vary greatly in size. Rock bass are about 6 inches (15 centimeters) long. By contrast, giant sea bass may be more than 6 feet (2 meters) long and more than 500 pounds (225 kilograms) in weight.

Sea bass are large-mouthed ocean fishes that usually prefer warmer waters. They are usually large. Some can change color. Sea bass feed on fish, mollusks, and smallmouth black bass



European sea bass



other small animals without spines. They also eat crustaceans, which are animals that live in shells.

Black bass live in the freshwater ponds, rivers, and lakes of North America.

Largemouth black bass have an upper jawbone that extends beyond their eyes. Their body varies in color from green to black, with a dark, horizontal stripe. Smallmouth black bass are smaller and have a green to brownish color. Black bass feed on smaller fishes.

► More to explore

Fish

Basseterre



Population
(2006 estimate)
12,900

Basseterre is the capital of Saint Kitts and Nevis, an island country in the Caribbean Sea. The town is located on the coast of Saint Kitts Island. It is the country's largest town and main port. Basseterre is also a center for shipping goods to nearby islands. Its chief industries are tourism and sugar processing.

The French founded Basseterre in 1627. The British took over Basseterre and the rest of Saint Kitts and Nevis in 1783. A fire destroyed Basseterre in 1867, but

the town was rebuilt. In 1983 Saint Kitts and Nevis became an independent country. Basseterre became its capital.

► More to explore

Saint Kitts and Nevis

Bastille Day



Jets trail the French national colors at a Bastille Day parade in Paris, France.

The French celebrate their freedom each year on July 14. On that day in 1789 an angry mob attacked the Bastille, a state prison in Paris. The mob associated the prison with the harsh rule of the king of France. The attack is therefore considered the beginning of the French Revolution, which forced the king to give up control of the country. French people celebrate the day much as Americans celebrate the Fourth of July, with parades, speeches, and fireworks.

Bastille Day was first celebrated in 1790, but it did not become a French national

holiday until 1880. Long before that, the Bastille itself was torn down.

► More to explore

French Revolution

Bat

Bats are the only mammals that can truly fly. Sometimes people mistake bats for birds. But bats are more closely related to other mammals—including humans—than they are to birds. And bats do not have feathers.

Where Bats Live

There are about 900 species, or types, of bat. Bats are found worldwide, especially in the tropics. They usually rest in dark places such as caves, hollow trees, or attics.

Physical Features

Bats have fur that is usually gray, tan, brown, or black. They vary greatly in size, depending on the species. Their wings can measure from 6 inches (15 centimeters) to 5 feet (1.5 meters) across when spread open. Their ears point forward and are usually very large.



A leaf-nosed bat flies in the night.

The wings consist of thin layers of bare skin. They stretch from the long arms down to the legs.

Behavior

Most kinds of bat live in large groups. Nearly all bats rest during the day. Most bats eat flying insects. Some kinds eat small animals such as birds, frogs, mice, and fish. Other kinds eat fruit or the pollen and nectar from flowers. The vampire bats of South and Central America feed on the blood of mammals and large birds.

While flying, most bats send out a cry. This cry is so high-pitched that people cannot hear it. The sounds bounce off objects and echo back to the bat. The bat can figure out the distance and size of the objects based on the returning sounds. Bats use this information to avoid flying into objects in their paths and also to find insects to eat.

► More to explore

Animal • Mammal

Baton Rouge



Population
(2000 census),
city, 227,818;
(2007 estimate)
227,071

Baton Rouge is the capital of the U.S. state of Louisiana. The city is located on

the Mississippi River. It is one of the leading U.S. ports. Goods brought to the port by rail and river are transferred to oceangoing ships. Baton Rouge is also a center of industry and services. Its chief industries process oil and natural gas.

The French founded Baton Rouge in 1719. The city and its surrounding area changed hands several times. The British gained control of Louisiana in 1763. But the Spanish captured it in 1779. In 1800 France again took control of Louisiana. A few years later the United States bought Louisiana from France. Louisiana became a U.S. state in 1812. Baton Rouge became the state capital in 1849.

► More to explore

Louisiana

Battery

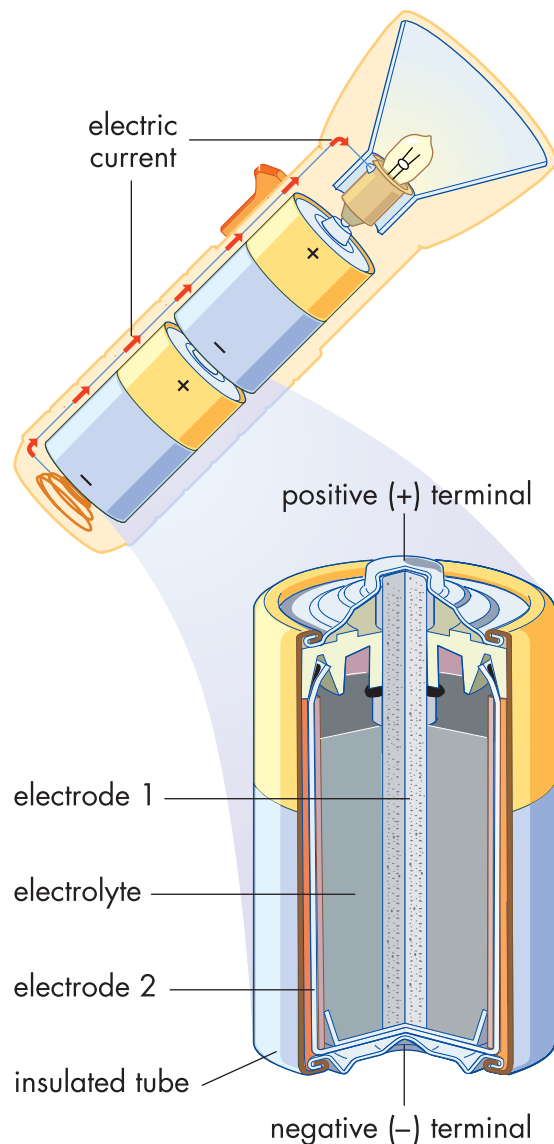
Batteries give electric power to flashlights, radios, cell phones, handheld games, and many other types of equipment. A battery is a sort of container that stores energy until it is needed. Chemicals inside the battery store the energy. When the battery is used, the chemical energy changes into electric energy.

How Batteries Work

Inside a battery there are two pieces of metal in a liquid or a paste. The metal parts are called electrodes. The liquid or paste, called an electrolyte, is a mix of chemicals. Each electrode has a point, called a terminal, that sticks out of the battery.

Did You Know?

"Baton rouge" means "red stick" in French. French settlers named the town for a post they saw that marked a boundary between Native American territories.



In some flashlights, two or more batteries produce an electric current. The current flows out of the batteries, through a wire, and through a lightbulb.

For a battery to work, the terminals must be linked by an outside wire. Then the chemicals in the electrolyte cause tiny particles called electrons to flow out of one electrode's terminal (the negative terminal). The electrons travel along the wire back to the other terminal (the positive terminal). This flow of electrons is an electric current. The wire usually runs through a lightbulb or other device

before returning to the battery. The current flowing through the wire makes the device work.

Types of Batteries

There are two basic types of batteries. A battery that can be used only once is called a primary battery. When the metals or electrolyte is used up, the battery can no longer make electricity. The batteries used in flashlights, radios, and toys are primary batteries.

A battery that can be used more than once is a secondary battery. Car batteries and some batteries used in telephones and medical equipment are secondary batteries. Secondary batteries can be recharged with an electric current from another source. For example, a person can recharge a cell phone battery by plugging the cell phone into an electric socket in a wall.

► More to explore

Electricity • Energy

Bean

Beans are seeds that people often eat. They are an excellent source of protein. Beans are used in many dishes, including soups and chili.

Many different plants produce beans, but they are all members of the same scientific family. The family includes peas, peanuts, and lentils as well as beans. These plants grow in most parts of the world. Most types grow either as a bush or as a climbing plant.



Beans come in many different shapes, sizes, and colors.

Beans come in many colors—white, green, yellow, tan, pink, red, brown, purple, and black. They also have different shapes. Some are nearly round or oval. Others are flat or kidney-shaped.

Beans grow inside cases called pods or legumes. Pods are usually 3 to 8 inches (7.6 to 20 centimeters) long. They come in shades of green, yellow, red, and purple. Many pods are too tough to eat. This is why beans are usually taken out of the pod. Some pods can be eaten if

they are picked at an early stage in their growth. These include green beans (also known as snap or string beans).

Dry beans are grown only for their dry seeds, not the pods. They include pinto, lima, navy, black, kidney, fava, and mung beans.

One of the most useful beans is the soybean. Many chemical products, including paint, are made from soybean oil. Soybeans are fed to farm animals. They are also a rich source of protein for people around the world. They are used to make soy milk, soy sauce, and tofu.

► More to explore

Legume • Seed

Bear

Bears are large, powerful mammals related to dogs and raccoons. The biggest bears are the world's largest animals that live on land and eat meat.

There are several species, or types, of bear. They are the polar bear, the brown bear, the black bear, the Asiatic black bear, the sun bear, the spectacled bear, and the sloth bear. The brown bear is commonly called the grizzly bear in North America. Most scientists also consider the giant panda to be a member of the bear family.

Where Bears Live

Bears are found in the Americas, Europe, and Asia. They are often found in mountainous areas and forests. The black bear lives in North America. The



Many beans are taken out of the pod before they are eaten.

Did You Know?

The polar bear has fur on the bottom of its feet. This fur helps the bear to keep from slipping on ice.



A polar bear travels over snow and ice in the Arctic region of Canada.

brown bear is found in North America, Europe, and Asia. The Asiatic black bear and the sloth bear live in parts of Asia. The world's far northern regions called the Arctic are home to the polar bear.

Physical Features

Bears range in height from about 3 to 10 feet (1 to 3 meters). The sun bear is the smallest species. A kind of Alaskan brown bear called the Kodiak bear is the largest bear. It may weigh 1,720 pounds (780 kilograms). Some polar bears are almost that big.

Most bears are mainly brown, red-brown, or black. Some have white markings on the chest or face. The type called

the black bear is sometimes actually brown, blue-gray, or even white. The polar bear's white fur helps it blend in with the Arctic ice and snow.

A bear has a broad head, a heavy body, short legs, and a small tail. Bears have poor eyesight but an excellent sense of smell. Most kinds are good at climbing trees and at swimming.

Behavior

Bears are carnivores, or meat eaters. For example, the polar bear eats seals, walrus, and fish. However, other bears eat a lot of plants as well as animals. They may eat roots, seeds, berries, and nuts in addition to insects, fish, and deer.

In the autumn most bears eat a lot to put on extra fat. They then sleep through most of the winter. This is similar to a very deep resting state called hibernation. But bears are not true hibernators. Their body temperature, heartbeat rate, and breathing rate do not drop much lower than normal.

► More to explore

Hibernation • Mammal • Panda



Brown bears fish for salmon in Alaska.

Beatles, The

The Beatles were one of the most successful and influential pop-music groups of the 1960s. This quartet of British musicians were rhythm guitarist John Lennon (October 9, 1940–December 8, 1980); bass guitarist Paul McCartney (born June 18, 1942); lead guitarist George Harrison (February 25, 1943–November 29, 2001); and drummer

Ringo Starr (originally Richard Starkey; born July 7, 1940).

Beginnings

Lennon formed a band in Liverpool, England, while in high school in the mid-1950s. McCartney and then Harrison joined the group in the late 1950s. In its early years the band also had several other members. In 1962 they signed a recording contract with a large music company. At about this time they chose Starr to replace drummer Pete Best.

At first the Beatles' songs were upbeat and fairly simple. The first song recorded by the Beatles was "Love Me Do" in 1962. Their first hit came the following year, when "Please Please Me" climbed to the top of the British music charts.

Beatlemania

The Beatles became very famous in Britain. People started calling the excitement over the band Beatlemania. The Beatles became wildly popular in the United States too after appearing on Ed Sullivan's television program in February 1964. Teenage girls across the country screamed and fainted over them, and boys copied the Beatles' look. By April 1964 the top five hits in the United States were all Beatles songs.

Later Years

In the late 1960s the Beatles began creating more adventurous music, combining different musical styles. The album *Sergeant Pepper's Lonely Hearts Club Band* (1967) showed a new complexity.



The Beatles were John Lennon, George Harrison, Paul McCartney, and Ringo Starr.

The band also recorded the albums *The Beatles* (1968), *Abbey Road* (1969), and *Let It Be* (1970).

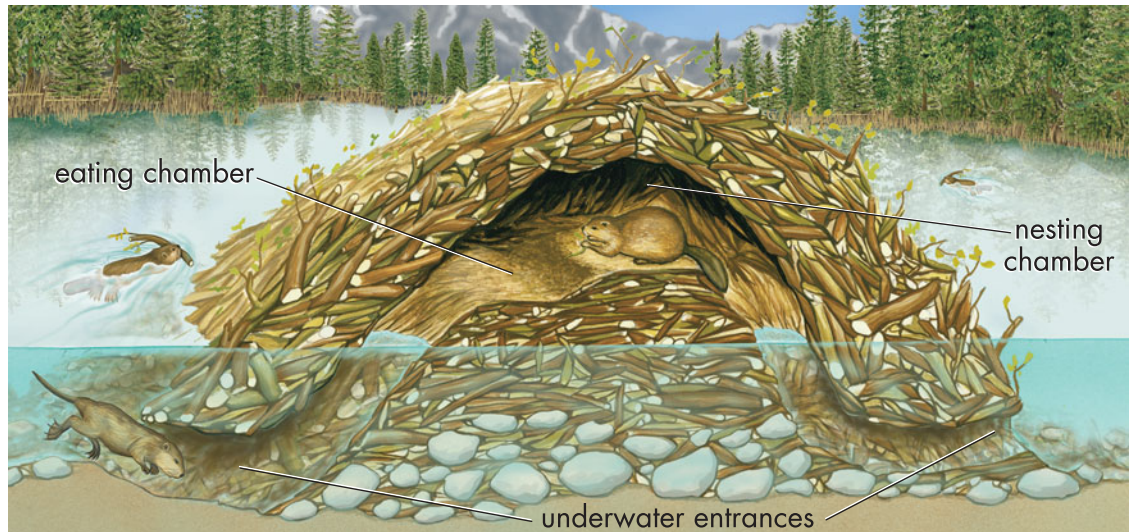
The pressures of fame led the Beatles to break up in 1970. All four continued their musical careers—Lennon with his wife, Yoko Ono; McCartney with the band Wings and later as a solo performer; and Starr and Harrison mainly as solo artists.

► More to explore

Popular Music

Beaver

Beavers are mammals known for their building skills. They use branches, stones, and mud to build structures called dams. A dam stretches across a stream and blocks the flow of water. This creates a large pond. Beavers build



Beavers live in dome-shaped lodges. They build the lodges out of branches plastered with mud. Tunnel entrances open into a room above water level.

their homes in the still waters of these ponds rather than in rushing streams.

Beavers belong to the group of animals called rodents. They are related to mice, squirrels, and muskrats. There are two species, or types, of beaver. The American beaver is found in North America. The Eurasian beaver is found in parts of Europe and Asia. Beavers live in rivers,

streams, and lakes. They also spend some time on land.

Beavers are about 4 feet (1.3 meters) long, including the tail. Beaver tails are scaly, flat, and shaped like paddles. Thick brown fur covers their stocky body and short legs. Beavers use their small front feet to carry objects. Their large back feet are webbed, which helps them swim. Beavers can stay underwater for up to 15 minutes.

Beavers are active at night. They eat mainly trees, including buds, leaves, twigs, and the layer under the bark.

Beavers use their powerful jaws and teeth to cut down young trees. They work in groups to build dams. Pairs of beavers build homes called lodges out of sticks and mud. A lodge may be 5 feet (1.5 meters) high. Its roof is shaped like a dome.

► More to explore

Dam • Rodent



A Eurasian beaver gnaws on a branch.

Beckham, David



David Beckham shows his skills on the soccer field at a match in 2005.

Soccer star David Beckham is known as a great midfielder. His shots often appear to “bend” around players from the other team.

David Robert Joseph Beckham was born on May 2, 1975, in London, England. At age 11 he won a soccer contest. One of England’s best teams, Manchester United, soon took interest. As a teenager, Beckham played for Manchester United’s youth team and led it to a national championship.

Beckham joined the professional Manchester United team in 1995. He went on to help the team win six Premier League championships.

Beckham also played for England’s national team for 11 years. He led the team to appearances in the World Cup

in 1998, 2002, and 2006. In 2006 he made history by becoming the only player from England’s national team to score a goal in three World Cup tournaments.

In 2003 Beckham left Manchester United. He joined the Spanish soccer club Real Madrid. Four years later he moved to the United States to play for the Los Angeles Galaxy team. In 2008 he signed a deal to play for the Italian team AC Milan during the Galaxy’s off-season.

► More to explore

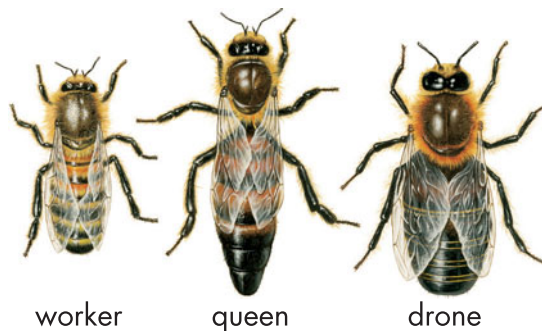
Soccer

Bee

Bees are insects related to wasps and ants. They live all over the world except Antarctica. There are more than 20,000 species, or types, of bee. The best-known kinds are honeybees and bumblebees. People have kept honeybees for their honey for at least 4,000 years. Honeybees also produce beeswax, which people use to make candles.

Physical Features

Adult bees range in length from about 0.08 to 1.6 inches (0.2 to 4 centime-





Worker honeybees surround a queen as she lays eggs.

ters). They usually have a short, thick body covered with hair. Most bees are black, often with yellow or brown markings. Like all insects, bees have six legs. They have two pairs of wings and five eyes. They also have mouth parts that act like a long tongue. Female bees also have a stinger. Male bees cannot sting.

Role in Pollination

Bees get all their food from flowers. This food consists of a sweet liquid called nectar and a dustlike substance called pollen. Honeybees change nectar into honey, which they feed to their young. Bees also gather pollen to feed their young. As they go from flower to flower, they spill some pollen. In this way bees perform a very useful task. When pollen spreads from one flower to another of the same kind it allows the flowers to make seeds and therefore to make new flowers.

Behavior

Most kinds of bee live in small families. But some bees live in large, organized groups that work together. These social

bees include honeybees and some bumblebees. They are divided into classes. Most of the females are workers. They gather pollen, build the nest, and take care of all the young. Each nest has one queen. Her eggs develop into females. The workers' eggs develop into males. Male bees, called drones, help the queen reproduce.

► More to explore

Ant • Insect • Pollen • Wasp

Beet

Beets are vegetables. They come in four different types. The garden beet, the sugar beet, Swiss chard, and the mangelwurzel are all varieties of the same plant. This plant's scientific name is *Beta vulgaris*. It is related to spinach.



Garden beets, or beetroots, have red roots that are often eaten after being cooked or pickled.

Beets grow in Europe, Asia, and North America. The beet plant is a biennial, which means that it lives for two years. The root forms in the first year. In garden beets, the root is thick and usually round. It measures 1 to 4 inches (2.5 to 10 centimeters) across when fully grown. The roots of garden beets are usually red or purplish red. Sugar beets have white roots. Those of mangel-wurzels are yellowish. Swiss chard does not have thick roots.

In the second year, a stem grows. It is tall and leafy. The stem has groups of small green flowers. These flowers become brown fruits called seedballs.

The leaves of the garden beet are a good source of vitamins A and C. Many people also eat its root. A beet soup called borscht is popular in eastern Europe. Swiss chard is grown for its large leaves, which are used in cooking. Mangel-wurzels are mostly fed to cattle.

The sugar beet is the most valuable type of beet. In 1747 a German chemist first made sugar from beets. Today about one third of the world's sugar comes from sugar beets.

Beethoven, Ludwig van

The composer Ludwig van Beethoven created some of the most influential music in history. He transformed many traditional forms of Western classical music. For example, he set new stan-



A portrait of Ludwig van Beethoven shows him writing his music.

dards for the symphony, creating longer pieces that expressed important ideas and deep feelings rather than just serving as entertainment. His works include nine symphonies, one opera, and many pieces for small groups and for piano and other solo instruments.

Early Life and Career

Beethoven was born in Bonn, Germany, in December 1770. He learned musical composition from the official organist in a nobleman's court. Beethoven became the assistant organist at age 11 and published his first musical composition soon after.

In 1787 Beethoven studied briefly with the great composer Wolfgang Amadeus Mozart in Vienna. Five years later Beethoven settled in Vienna permanently. There he studied with Joseph Haydn and other famous composers.

Did You Know?

Beethoven could not hear the audience clapping when his *Ninth Symphony* was first played. He did not know that they liked it until he turned to look at them.

Growing Fame and Deafness

Beethoven became known as a highly skilled piano player. Many of Vienna's wealthy residents enjoyed his music and gave him money to live on. In 1800 he performed some of his works at a large public concert in Vienna. This event helped him become widely famous.

In the late 1790s Beethoven began to lose his hearing. For some time he continued to compose and perform as before. But by 1819 Beethoven had become totally deaf. From then on he no longer performed much in public, spending most of his energy composing music.

In his last years Beethoven created longer and more complicated pieces. In 1824 he conducted the first performance of his *Ninth Symphony* with great success despite being unable to hear the music. Beethoven died in Vienna on March 26, 1827. The masterpieces he created continue to be performed nearly two centuries after his death.

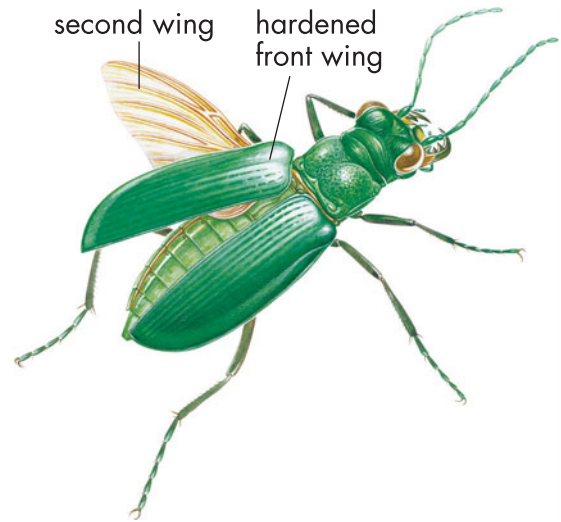
► More to explore

Classical Music • Mozart, Wolfgang Amadeus

Beetle

Beetles are insects that have hardened front wings. These front wings are not used for flying. Instead, they cover and protect a second pair of wings. In the past all beetles could fly. But some kinds have lost that ability over time.

There are at least 250,000 species, or types, of beetle. Some beetles are called



by other names, such as weevils, fireflies, ladybugs, borers, and chafers. Beetles are found all over the world except Antarctica and the peaks of the highest mountains. Most live on land, but some live in water.

Beetles vary greatly in size. Adult beetles range in length from about 0.01 inch (0.025 centimeter) to more than 7 inches (18 centimeters). Many kinds are colorful. They may be bright orange, red, yellow, green, or blue. Some kinds are black or brown.

Adult beetles have two antennae, or feelers, on the head. These help beetles find food and recognize other beetles. Like all insects, they have six legs. A hard covering protects the body.

Beetles eat a great variety of foods, including other insects, small animals, and plants. Some kinds are useful to humans because they eat insect pests, garbage, or decaying meat. Other kinds are harmful. They destroy crops, spread disease, or eat clothing and carpet.

Many beetles produce light and sound to attract a mate or frighten an enemy. They make light by mixing chemicals inside special organs. They make a high-pitched sound by rubbing together two hard body parts.

Beetles hatch from eggs. The newborn beetles do not look like adult beetles. Over the course of their lives, their form changes completely. Their bodies change in three stages: larva, pupa, and adult. This process is called metamorphosis.

► More to explore

Firefly • Insect • Metamorphosis

Beijing



Population
(2007
estimate), urban
area,
11,106,000

Beijing is the capital of China, a country in eastern Asia. The city sits between two rivers on a plain in northeastern China. Beijing is an old city that has played an important role in China's history. It has been China's center of government for almost 800 years. It is also the country's main center of industry, education, and culture.



European rhinoceros beetle



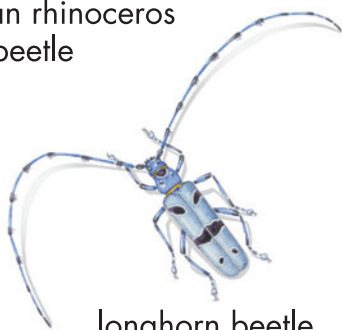
clover seed weevil



great silver water beetle male



violet ground beetle



longhorn beetle



green tiger beetle



seven-spotted ladybug



stag beetle male



deathwatch beetle



click beetle



glowworm

Beetles come in many different sizes and colors.

Places of Interest

A huge plaza called Tiananmen Square is often the site of political celebrations. Many museums and monuments are located there. At one end of the square is a large gate called the Tiananmen. It has become a symbol of China.

Through this gate is the Forbidden City, a group of buildings from the 1400s. It contained the palaces of several emperors. The Forbidden City was so named because for many years common people were not allowed there. It is now a museum that is open to the public.

Beijing is famous for its many parks. The Summer Palace is known for its beautiful landscaping and buildings, including temples and bridges. Tiantan Park contains the Temple of Heaven, where emperors used to pray. Beihai Park was built in the 1600s. Today, its



The Temple of Heaven in Beijing is more than 500 years old.



Hundreds of children show their martial arts skills in Beijing, China.

large lake is filled with boats in the summer and ice skaters in the winter.

Economy

Factories in Beijing make cloth, cars, electronics, computers, and machinery. Unlike in many large cities, farmers grow fruits and vegetables in the city itself. Tourism also brings money to Beijing.

History

People have lived in the Beijing area for thousands of years. Several towns were built on the site and later destroyed. In the 1200s the Mongol leader Kublai Khan built the city of Dadu on the site. He made Dadu the capital of China. Except for a few brief periods, the city has been China's capital ever since.

The city was renamed Beijing in the early 1400s. It was known as Peking in the United States and other Western countries until the early 1980s. "Beijing" is now the official way to write the city's name in English.

In 1989 students held a protest against the government in Tiananmen Square. Government forces brought in tanks and killed many people to break up the protest. People around the world criticized the government for its actions. In the 1980s and '90s, three of Beijing's historical areas were named World Heritage sites by a branch of the United Nations. They were the Forbidden City, the Summer Palace, and the Temple of Heaven.

► More to explore

China • Mongol Empire

Beirut



Population
(2003 estimate)
1,171,000

Beirut is the capital of Lebanon, a country in the Middle East. The city spreads over two hills along the coast of the Mediterranean Sea. Beirut is Lebanon's main port and largest city. It was once the most modern city in the Middle East. However, a war in the late 20th century caused a lot of damage there.

Tourism, banking, and other services are important to the economy. Trade through the port also brings money to the city. Other major industries include printing and food processing.



Modern buildings stand among the ruins of ancient structures in Beirut.

Beirut is an ancient city. It has been conquered, destroyed, and rebuilt a number of times. Over the centuries it was ruled by Romans, Christian Crusaders, and Arabs. Beirut was part of the Turkish Ottoman Empire from the 1500s to the early 1900s. After World War I (1914–18) the French ruled Lebanon. They made Beirut the capital. Lebanon became an independent country in 1943. Beirut remained its capital.

Groups of Lebanese Muslims and Lebanese Christians fought each other in a civil war from 1975 to 1991. During the war Beirut was divided into two sections—a Christian East Beirut and a Muslim West Beirut. After the war the city remained divided, but it began to rebuild its damaged buildings and economy. In 2006 the city was damaged again in fighting between the Lebanese Muslim group known as Hezbollah and forces from Israel.

► More to explore

Lebanon

Did You Know?

Beirut has been a center for education since ancient times. The American University of Beirut became a respected school during the 1900s.



Belarus

Belarus is a country in eastern Europe. Its capital and largest city is Minsk.

Belarus shares borders with Russia, Poland, Ukraine, Lithuania, and Latvia. Most of the country is flat, except for central low hills. There are many wetlands, including the Pripet Marshes in the south. Belarus has cold winters and cool summers.

Silver birch trees grow throughout Belarus. Pines and spruces grow in the north, while oak and hornbeam trees grow in the south. Elk, deer, boars, and European bison live in the forests. Birds include partridges and ducks.

Belarusians make up the largest ethnic group, followed by Russians. Most people speak Belarusian and Russian. Less than half the people are Christian; the rest are nonreligious. More than two thirds of the people live in cities.

Facts About BELARUS



Population
(2008 estimate)
9,675,000

Area
80,153 sq mi
(207,595 sq km)

Capital
Minsk

Form of government
Republic

Major cities
Minsk, Homyel, Mahilyow, Vitsyebsk, Hrodna



People dance around a burning scarecrow in Minsk, Belarus. The festivities are part of a celebration marking the end of winter.

Banking and other services, manufacturing, and mining are important to Belarus' economy. Manufacturers make machinery, chemicals, and food. Mines provide potash, which is used to make fertilizers. Belarus is also a leading producer of peat, a type of fuel. Farmers grow potatoes, sugar beets, barley, and rye.

Slavic people settled in what is now Belarus between the AD 500s and 700s. Over the years the area was controlled by various foreign powers, including Russia, which took over in the 1700s. In 1922 Belarus became part of the Soviet Union. In 1986 an accident at the Chernobyl nuclear power plant in Ukraine led to many health problems in Belarus. In 1990 Belarus broke away from the Soviet Union. In 1991 it declared full independence.

► More to explore

Minsk • Union of Soviet Socialist Republics • Wetland

Belau

► see Palau.

Belfast



The United Kingdom is a country in western Europe that is made up of four main parts: England, Scotland, Wales, and Northern Ireland. Belfast is Northern Ireland's capital and largest city. The city is located in the northeastern part of the island of Ireland. It lies where the Lagan River flows into a part of the Irish Sea.

The economy of Belfast is based mainly on service industries, such as health care, social services, and tourism. The city is Northern Ireland's center of trade, bank-

ing, and education. It is also the main seaport in Northern Ireland.

People have lived in the Belfast area for thousands of years. Belfast began as a small fishing village. In the 1600s Scottish and English settlers formed a colony in the area. They built up a large industry that made linen cloth.

Belfast and the rest of the island of Ireland became part of the United Kingdom in 1801. In 1920 the southern part of the island became the separate country of Ireland. Belfast was made the capital of Northern Ireland, which remained in the United Kingdom.

Throughout much of the 1900s Belfast was torn by violent conflicts between its two main groups—Protestants and Roman Catholics. They fought about whether Northern Ireland should stay in the United Kingdom or join Ireland. The United Kingdom is mainly Protestant, while Ireland is mostly Catholic. Most of the city's people are Protestant.

In the late 1960s Belfast's Catholics protested against unfair treatment by the Protestants. Deadly violence broke out. Many people left the city in the 1970s and 1980s because of the violence and the loss of manufacturing jobs. The fighting lasted until a peace agreement was signed in 1998. After that the city was more stable, and its economy improved. However, clashes broke out again in the early 21st century.

Did You Know?

Belfast is famous for its shipbuilding. The passenger ship *Titanic*, which sank during its first trip in 1912, was built in Belfast.



Queen's University is the oldest university in Belfast. It was founded in 1845 by Victoria, queen of the United Kingdom.

► More to explore

Northern Ireland • United Kingdom



Belgium

The Kingdom of Belgium is a small, prosperous country in northwestern Europe. Brussels is the capital and largest city.

Geography

Belgium is bordered by The Netherlands, Germany, Luxembourg, and France. The North Sea lies to the northwest.

Belgium is divided into three main regions. Lower Belgium, in the north, is flat and low. Middle Belgium, in the central part of the country, has many farms on its plains. Upper Belgium, in the south, includes the Ardennes highlands and forests. Most of Belgium's wild animals—including boars, wildcats, deer, and pheasants—are found in the Ardennes.

People

Belgians are divided into two main groups. More than half of the people are



The Ardennes is a region of hills and forests in the south of Belgium.

Flemings, who live mostly in the north. About one third are Walloons, who live mostly in the south. The Flemings speak Netherlandic, also known as Flemish or Dutch. The Walloons speak French. A smaller number of people speak German. Most Belgians are Roman Catholics. Most of the people live in cities.

Economy

Banking and other services, manufacturing, and international trade are the most important parts of Belgium's economy. Manufacturers make chemicals, food products, cars and car parts, and machinery. The city of Antwerp is a center of diamond cutting and dealing. Farming is only a small part of the economy.

History

Belgium takes its name from the Belgae, a group of Celts who settled in





The city of Brugge in northwestern Belgium is known for its network of canals.

the region during prehistoric times. The Romans, led by Julius Caesar, conquered the area in 57 BC. Germanic Franks took control of the area in the AD 400s and converted the people to Christianity. By the end of the 800s Belgium was divided into many independent territories. Flemish towns became centers of international trade during the Middle Ages.

Foreign Rule

In the 1300s Belgium came under the control of Burgundy, a territory that included part of France. The Hapsburgs, a powerful German family, ruled Belgium for most of the 1500s through the 1700s.

In 1795 France seized Belgium. Following the defeat of French emperor Napoleon I in 1815, Belgium passed to the mostly Protestant country of The Netherlands. The many Roman Catholics in Belgium fiercely resisted Dutch rule. In 1830 the Belgians rose up in rebellion,

and the following year they proclaimed the independent Kingdom of Belgium.

Independence

In the late 1800s Belgian king Leopold II gained control of a colony in the Congo region of Africa (now the Democratic Republic of the Congo). The Belgians ruled their colony, sometimes harshly, until 1960.

During World War I (1914–18) and World War II (1939–45) Germany invaded and occupied Belgium. During World War II the Nazis sent hundreds of thousands of Belgians to Germany and forced them to work.

After World War II Belgium supported the peaceful cooperation between the countries of western Europe. It was a founding member of the North Atlantic Treaty Organization (NATO) and the European Economic Community (later called the European Union).

During the 1960s tensions grew between Flemings and Walloons. The government divided Belgium into three language regions: Flemish Flanders, French Wallonia, and bilingual Brussels. In the 1990s the regions gained more power to govern their own affairs, such as education, transportation, and cultural matters. They shared other powers with the national government. The king kept little political power.

► More to explore

Brussels • Congo, Democratic Republic of the • European Union • Hapsburgs • North Atlantic Treaty Organization

Facts About BELGIUM



Population
(2008 estimate)
10,697,000

Area
11,787 sq mi
(30,528 sq km)

Capital
Brussels

Form of government
Federal constitutional monarchy

Major cities
Brussels, Antwerp, Ghent, Charleroi, Liège

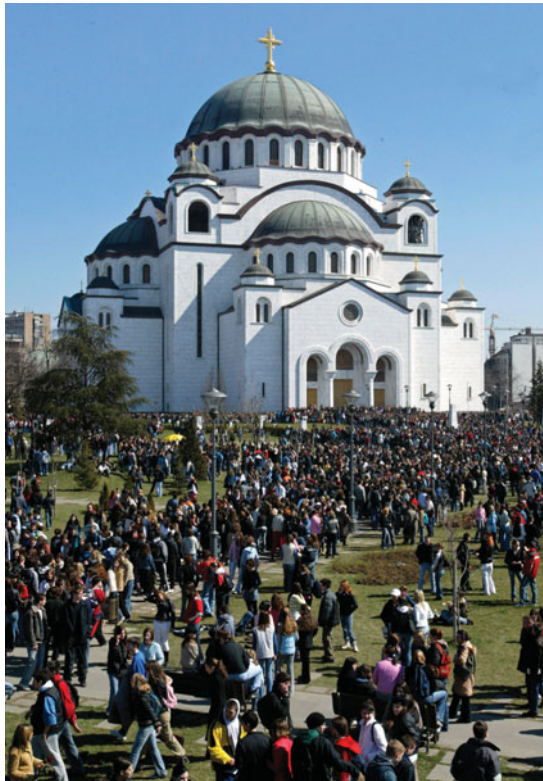
Belgrade



Population
(2002 estimate)
1,120,092

Belgrade is the capital of Serbia, a country in southeastern Europe. The city is located where the Sava and Danube rivers meet.

Most of Serbia's industry is in Belgrade. Factories there make tractors, machines, electrical equipment, chemicals, and clothing. Many people in Belgrade work



A crowd of students gathers at Saint Sava Church in Belgrade for a peace celebration.

for the government or in service industries, such as education and banking. Serbia's best farmland is also in the Belgrade region.

Belgrade has long been an important city because of its location. Several land and river trade routes meet at the city's site. Celtic people settled the site in the 300s BC. The town was later attacked and rebuilt many times. In AD 1284 a group called the Serbs captured Belgrade. In 1402 they made Belgrade the capital of their kingdom. The Turkish Ottoman Empire ruled the city from 1521 to the 1800s. In the late 1800s Belgrade again became the capital of Serbia.

In the 1900s fighting damaged Belgrade many times, including during World Wars I and II. In 1918 the city became the capital of the new Kingdom of Serbs, Croats, and Slovenes. That country was later renamed Yugoslavia. In the early 1990s parts of Yugoslavia broke away, leaving only Serbia and neighboring Montenegro in the country. In 1999 a part of Serbia called Kosovo tried to break free. International forces bombed Belgrade during the conflict.

In 2003 Yugoslavia changed its name to Serbia and Montenegro. The government remained in Belgrade. In 2006 Serbia and Montenegro split, and Belgrade became the capital of Serbia.

► **More to explore**
Serbia

Belize

The Central American country of Belize was Great Britain's last colony on the American mainland. The capital is Belmopan.

Belize is bordered by Mexico and Guatemala. The Caribbean Sea lies to the east. Rain forests cover much of the interior. The Maya Mountains run through the south. Lowlands lie along the coast. The climate is warm year-round. Hurricanes may occur from July through November, during the rainy season.

Forests of mahogany, sapodilla, and other trees cover almost half of Belize. Grasslands and mangrove trees cover the coastal lowlands. Wild animals include jaguars, tapirs, American crocodiles, and manatees.

The people of Belize include mestizos (people with both European and Mayan roots), Creoles (those with European and African roots), Maya Indians, and Gari-



The Mayan ruins of Xunantunich sit on a hilltop in Belize.

funa (those with African and Caribbean Indian roots). There are also some whites and Asians. English is the official language, but people speak many local languages. Most of the people are Christian. About half of the people live in cities.

Tourism and trade are the most important parts of Belize's economy. But many people in Belize earn their living from farming. Sugarcane, oranges, grapefruit, and bananas are among the main food crops. Fishing and logging are important, too. Belize's exports include shrimp, sugar, fruit, and clothing.

The Maya lived in what is now Belize from about AD 300 to 900. The Spanish came in the 1500s. British loggers settled there in the 1600s. In 1862 Great Britain made the area the colony of British Honduras. Belize gained independence in 1981.

► More to explore

Belmopan • Central America • Maya



Facts About BELIZE



Population
(2008 estimate)
323,000

Area
8,867 sq mi
(22,965 sq km)

Capital
Belmopan

Form of government
Constitutional monarchy

Major cities
Belize City, San Ignacio/Santa Elena, Orange Walk, Belmopan, Dangriga

Bell, Alexander Graham

Did You Know?

Alexander Graham Bell also invented a machine called a photophone. It transmitted sound on a beam of light.

Alexander Graham Bell was an inventor and a teacher of the deaf. He is famous for creating one of the world's most important communication devices—the telephone.

Alexander Graham Bell was born in Edinburgh, Scotland, on March 3, 1847. Alexander was mostly schooled at home. As a young man Alexander worked with his father to teach deaf people to speak.

In the mid-1870s, Bell began work on the telephone with Thomas Augustus Watson. On March 10, 1876, Bell made the first successful test of the telephone. He spoke a few words to Watson, beginning with “Mr. Watson, come here.”

At the Centennial Exposition of 1876 in Philadelphia, Pennsylvania, Bell and



Alexander Graham Bell demonstrates his telephone in 1876.

Watson demonstrated the telephone to the public. People were amazed by this new device. In 1877 Bell established the Bell Telephone Company.

After his success with the telephone, Bell pursued his interests in science, invention, and the education of deaf people. In 1890 he founded an organization in Washington, D.C., to teach speech to hearing-impaired people. This organization later became the Alexander Graham Bell Association for the Deaf and Hard of Hearing.

Alexander Graham Bell died on August 2, 1922. At the time of his burial, every telephone of the Bell system in the United States and Canada was kept silent for one minute.

► More to explore

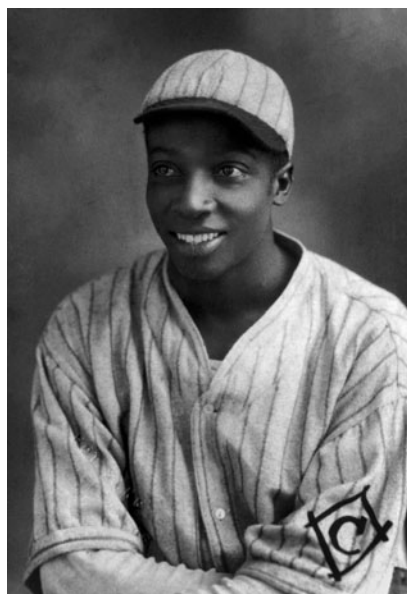
Telephone

Bell, Cool Papa

The baseball player called Cool Papa Bell is known as one of the fastest base runners of all time. He was elected to the Baseball Hall of Fame in 1974.

James Thomas Bell was born on May 17, 1903, in Starkville, Mississippi. He began playing baseball as a professional at age 19. At the time, African Americans were not allowed to play for major league teams. They played instead for teams in the Negro leagues.

Bell earned the nickname Cool Papa as a young pitcher. One day he struck out Oscar Charleston, a future Hall of Fame



Cool Papa Bell

player, without showing any nervousness at all. Later, after hurting his pitching arm, Bell played in the outfield.

Bell's career lasted from 1922 to 1950. He played for several different Negro league teams as well as for leagues in Mexico and the Dominican Republic. In 1940 he won the Mexican League's triple crown, leading the league in batting average, home runs, and runs batted in.

Bell's outstanding talent was his speed. It is believed that he once stole 175 bases in less than 200 games. The most famous story about his speed was told by his old roommate Satchel Paige. Paige joked that Cool Papa could turn out the hotel room lights and be in his bed before the room got dark!

Bell finished his baseball career in 1950 as a player-manager of a team in Kansas City. He died on March 7, 1991.

Belmopan



Population
(2007 estimate)
16,435

Belmopan is the capital of the small Central American country of Belize. Most people in the city work for the government of Belize.

Belize City was once the capital of Belize. Floods from a hurricane damaged Belize City in 1961. The government of Belize decided to build a new capital. It chose a site away from the coast to avoid flooding. Work began on Belmopan in 1966. The government offices moved there in 1970. But few people moved there besides government workers.

► More to explore

Belize



A fruit and vegetable market overflows with goods in Belmopan.



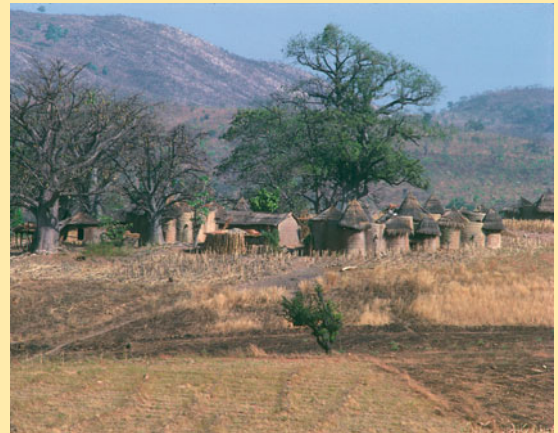
Benin

Benin is a country on the west coast of Africa. Porto-Novo is the capital, but many government offices are in the city of Cotonou.

Benin is bordered by Niger, Nigeria, Togo, and Burkina Faso. The Gulf of Guinea lies to the south. Benin is mostly flat but has some hills and low mountains. It is hot and humid in the south. The north is drier.

Woodlands cover most of central Benin. Grasslands cover the north. Elephants, antelope, panthers, monkeys, crocodiles, and tropical birds live in the south.

There are more than 40 ethnic groups in Benin. The largest groups are the Fon, the Yoruba, and the Adjara. Most Beninese are Christians or follow traditional beliefs, including voodoo. About 20 percent of the people are Muslims. French is the official language, but most people speak local languages.



A traditional village stands in the hills of Benin.

Benin's economy is based on agriculture. Its main crops include cassava, yams, corn, cotton, and oil palm fruit. The Beninese also raise cattle, goats, sheep, pigs, and chickens. Trade is another important industry. Benin's main products are cotton yarn, food and beverages, and crude petroleum (oil).

In the early 1600s several kingdoms, including the large and powerful Dahomey kingdom, ruled what is now Benin. Dahomey became one of the largest suppliers of slaves to Europeans. France made Dahomey a colony in 1894.

Dahomey became independent in 1960. After years of political troubles, army officer Mathieu Kérékou seized power in 1972. In 1975 he changed the country's name to Benin. In the 1990s Benin got a more democratic government.

► **More to explore**
Dahomey • Porto-Novo

Facts About BENIN



Population
(2008 estimate)
8,295,000

Area
43,484 sq mi
(112,622 sq km)

Capital
Porto-Novo

Form of government
Multiparty republic

Major cities
Cotonou, Porto-Novo, Parakou, Djougou, Abomey

Bering Sea

The Bering Sea lies between Asia and North America in the far northern part of the Pacific Ocean. On the west the sea borders the part of Russia called Siberia. To the east is the U.S. state of Alaska. The Aleutian Islands stretch across the sea's southern boundary.

The Bering Sea is one of the coldest and most dangerous seas in the world. In winter, the temperature over northern and eastern parts of the sea may drop to -49°F (-45°C). Floating ice is common in the north. Ships normally sail in the sea only between May or June and October.

Fishing and fish-related industries are the main economic activities in the region. More than 300 species of fish are found in the Bering Sea. They include herring, cod, flounder, halibut, and pollock. Huge numbers of salmon from Alaska and Russia spend their adult lives in the sea. There are also many shellfish.

The islands in the Bering Sea are a breeding ground for sea otters and fur



Water flows under a natural arch on the Bering Sea in Alaska.

seals. A huge number of seabirds also live in and around the sea.

► More to explore

Pacific Ocean

Berlin



Population

(2006 estimate), city, 3,395,189; urban area, 4,200,072

Berlin is the capital of Germany, a country in central Europe. It is Germany's largest city. Berlin is also a center of education and culture. Two of Germany's leading universities are in the city. The Berlin Opera and Berlin Philharmonic Orchestra are world famous.

Economy

Trade and the development of technology are important to Berlin's economy.



The city is also a center of industry. Factories in Berlin make electronics, machinery, chemicals, cloth, and many other products.

History

Berlin was founded in the early 1200s. It was the capital of the German kingdom of Prussia for most of the 1700s and 1800s. The city later became the capital of Germany.

During World War II (1939–45) Berlin was nearly destroyed. The city was the site of heavy bombing and bloody fighting. More than 150,000 residents of Berlin died.

Germany lost the war to the countries known as the Allies. The Allies divided Germany into two countries: East Germany and West Germany. They also divided Berlin into two sections. East Berlin became the capital of East Germany. (The capital of West Germany was Bonn.) Different Allied powers created different types of government in East and West Germany. The Soviet Union brought Communism into East Germany and East Berlin. The other Allied powers made West Germany and West Berlin a democracy.

About 2.5 million people fled from East Berlin into West Berlin between 1949 and 1961. To prevent more people from leaving, East Germany built a wall through Berlin. The Berlin Wall was heavily guarded. It separated East Berlin from West Berlin for almost 30 years.



For many years the Brandenburg Gate, on the left, was part of a wall that divided East and West Berlin. Now it stands at the center of a reunited Berlin.

East Germany's Communist government collapsed in 1989. People began to tear down the Berlin Wall. In 1990 the two parts of Germany and Berlin were reunited. Berlin was again the capital of all of Germany.

► More to explore

Communism • Democracy • Germany
• World War II

Bermuda

Bermuda is a cluster of islands in the North Atlantic Ocean. There are seven main islands and about 170 small islands. The seven main islands form a shape that looks like a fishhook. Bermuda is a colony of Great Britain. The capital is Hamilton.

Bermuda is far from other land. The closest land is Cape Hatteras, North Carolina, which lies about 650 miles (1,050 kilometers) to the west. The largest island is Great Bermuda, which is

Did You Know?

In 1948–49 the United States and its allies brought food to Berlin in airplanes, after Soviet troops blocked the roads. This project was called the Berlin Airlift.

usually called Main Island. It is larger than all the other islands combined. Coral reefs surround the islands.

Bermuda's climate is mild and humid. Common plants include flowering shrubs and palm, pine, and mangrove trees. Some birds visit the islands every year as they migrate. Lizards and frogs are the only other wildlife.

More than half of the people of Bermuda are black. They are descendants of Africans that white settlers brought to the islands as slaves. There are also many British and some Portuguese. English and Portuguese are the main languages.

Bermuda's economy depends on services. Tourism and finance are the most important industries. Many insurance companies and other financial businesses have offices in Bermuda.

Bermuda was named for the Spanish explorer Juan de Bermúdez. He may have visited the islands in 1503. English settlers arrived in Bermuda in the early 1600s. Britain made Bermuda a colony in 1684.

Britain and, later, the United States set up military bases in Bermuda. By the late 20th century the bases had been shut down. However, Bermuda remained a British colony. In 1995 the people of the islands voted against independence from Britain.

► More to explore

Atlantic Ocean • Coral

Bern



Population
(2007
estimate), urban
area, 344,724

Bern is the capital of Switzerland, a country in central Europe. The Aare River loops through the older part of the city. Bern's name comes from the German word for "bear." Bears are a symbol of the city. They have been kept on display in Bern for hundreds of years.

Many people in the city work for the government or the University of Bern. Tourism is also important to the economy. Factories in Bern make milk chocolate, condensed milk, machinery, and scientific instruments.

Bern began in 1191 as a military post. According to legend, it was named for the first animal killed by its founder, Berthold V, in that year. It grew into a city and then into an independent state. Bern became part of Switzerland in 1353. From the 1300s to the 1700s Bern was very powerful. This power ended when the French invaded in 1798. French rule ended in 1803. Bern became the capital of Switzerland in 1848.

► More to explore

Switzerland

Did You Know?

The Universal Postal Union, a group that sets rules for the flow of mail between countries, is based in Bern, Switzerland.

Berry

Berries are small, fleshy fruits that usually have many seeds. People and animals eat many types of berries.

A true berry is a single fruit that grows from one flower. Blueberries, cranberries, currants, and gooseberries are all true berries.

Botanists, or people who study plants, call many other fruits true berries. These fruits include grapes, tomatoes, dates, watermelons, and oranges.



Blackberries, strawberries, raspberries, and blueberries are all called berries. But scientists say that only one of them, the blueberry, is a true berry.

Most people call other fruits berries—for example, blackberries, raspberries, and strawberries. But these are not true berries. They are aggregate fruits, or groups of little fruits that grow from one flower. Mulberries are not true berries, either. They are multiple fruits, or fruits that grow from a bunch of flowers.

► More to explore

Blueberry • Cranberry • Fruit
• Raspberry • Strawberry

Bethlehem



Population
(2007 estimate)
25,266

Bethlehem is an ancient town in the Middle East. It is important to Christians, who believe it is where Jesus Christ was born. Bethlehem lies just outside the city of Jerusalem. It is located in an area called the West Bank. In modern times the country of Israel and the Palestinian people have fought to control the West Bank.

Tourists from all over the world visit Bethlehem because of its religious importance. Craftspeople in the town make religious gift items to sell to the tourists. Bethlehem is also a center of trade and a market for local farm products.

Bethlehem is an important historical site to Jews as well as to Christians. The town is mentioned in the Hebrew Bible as the early home of King David. He ruled a Jewish kingdom about 3,000 years ago.

The Christian Bible tells that Jesus was born in Bethlehem about 2,000 years ago. In the 300s the Church of the Nativity was built at the site thought to be Jesus' birthplace. It was rebuilt in the



Many Christians visit Bethlehem at Christmastime to celebrate the birth of Jesus Christ.

500s. Today it is one of the world's oldest Christian churches.

► More to explore

Israel • Jerusalem • Jesus Christ
• Palestine

Bethune, Mary McLeod

Throughout her life Mary McLeod Bethune worked to improve the lives of African Americans. She served as an adviser to President Franklin Roosevelt on the problems of minority groups. She also led several African American organizations.

Mary McLeod was born on July 10, 1875, on a small farm near Mayesville, South Carolina. Her parents were former slaves. She was not able to go to school until 1885, when missionaries opened a school for black children. She went on to college in North Carolina and Illinois. In 1898 she married Albertus Bethune.

She taught school in the South and in 1904 opened a school for black girls in Daytona Beach, Florida. She later said she started the school with nothing more than “five little girls, a dollar and a half, and faith in God.” It later merged with a school for boys called Cookman Institute and became Bethune-Cookman College.

Bethune later entered public life. In 1936 Roosevelt appointed her to the National Youth Administration. The year before that she had founded the National Council of Negro Women. She also served as vice president of the National Association for the Advancement of Colored People (NAACP) from 1940 to 1955. She died on May 18, 1955.

► More to explore

African Americans • National Association for the Advancement of Colored People • Roosevelt, Franklin D.



Mary McLeod Bethune



Bhutan

The country of Bhutan lies in the high Himalayas of south-central Asia. The capital is Thimphu.

Bhutan is surrounded by China and India. In the north, snowcapped mountains rise to more than 24,000 feet (7,300 meters). Valleys cover central Bhutan. In the south are jungles and savannas.

Pine and oak trees grow on the mountains. In the summer, yaks graze in pastures on the mountain slopes. Wild animals include snow leopards, monkeys, and migrating birds.

The Bhutia, people with ancestors from the Tibet region of China, make up about half of the population. The Bhutia practice Buddhism, the official religion, and mainly speak Dzongkha, the official language. The Nepalese are the second largest group. They speak Nepali and practice Hinduism. The smallest group



A Buddhist monastery known as the Tiger's Nest sits high up on a cliffside in western Bhutan.

is the Sharchops, Buddhists from nearby Indian areas who probably lived in the region first.

Farming is the main occupation of Bhutan. Farmers raise cattle, pigs, goats, horses, and sheep. They grow corn, rice, potatoes, sugarcane, wheat, fruits, and vegetables. Logging and construction are also important to the economy.

People from Tibet likely settled in what is now Bhutan in the AD 800s. In the 1600s a Tibetan Buddhist priest became the first king of Bhutan. The country's kings kept Bhutan isolated from the rest of the world for hundreds of years. In the mid-1900s that began to change. The king at the time made changes to start to modernize the country. By 2008 Bhutan had a new constitution and an elected parliament for the first time.

► **More to explore**
Himalayas • Thimphu • Tibet

Facts About BHUTAN



Population
(2008 estimate)
682,000

Area
14,824 sq mi
(38,394 sq km)

Capital
Thimphu

Form of government
Constitutional monarchy

Major cities
Thimphu,
Phuntsholing



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Bible

The Bible is an important book to both Jews and Christians. However, the Bible of Judaism is different from the Bible of Christianity, even though they include some of the same writings. The books of the Bible were written by many different authors over many hundreds of years.

The Bible of Judaism

The Jewish Bible focuses on the religious experiences of the ancient nation of Israel. It was written from about 1200 BC to 100 BC, mostly in Hebrew. It contains 24 books divided into three sections: the Law, the Prophets, and the Writings.



Many early copies of the Bible were written by hand. They included colorful pictures. One such illustration shows a story from the book of Exodus. It tells how Moses helped free the Israelites by leading them from Egypt through the Red Sea.

The first five books are Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. Together they are known as the Law because they explain and interpret God's laws. They also tell how ancient Israel became a nation and came to possess the promised land. These five books are sometimes called the Torah.

The books of the Prophets contain messages from the prophets—people of ancient Israel who spoke to the nation on behalf of God. These books also tell more about the history of ancient Israel.

The Writings section includes a variety of books that contain poetry, stories, history, and other types of literature. Among them is the Psalms, a collection of sacred songs and poems from various periods in the history of Israel. The other Writings use sayings and stories to teach people about proper behavior.

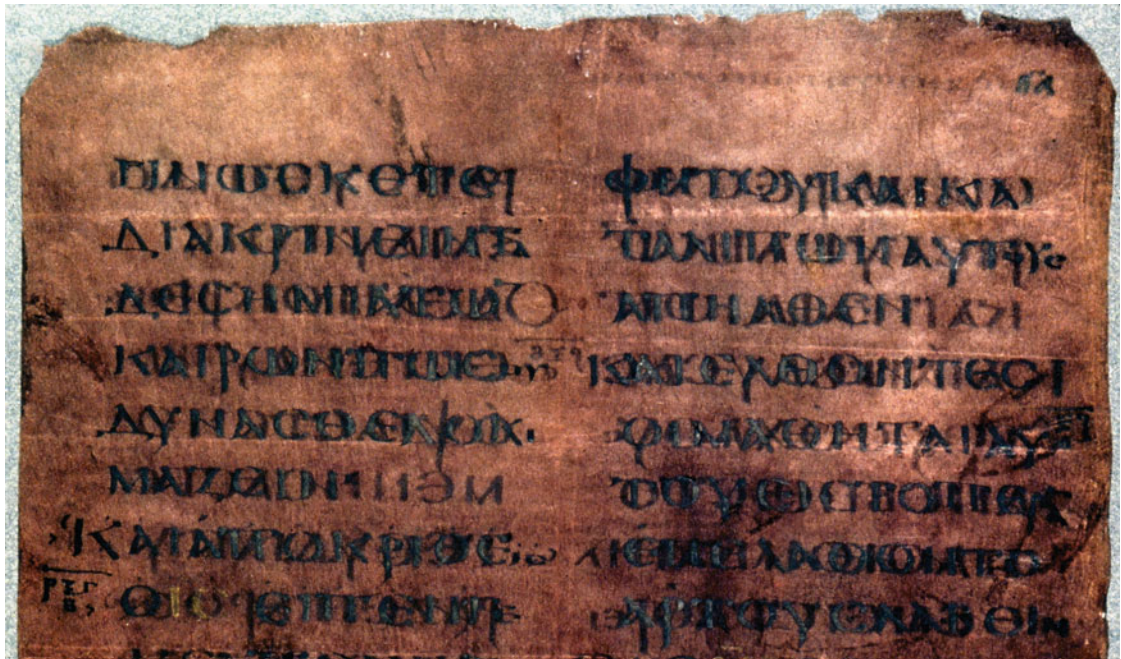
The Bible of Christianity

The Christian Bible is made up of two parts: the Old Testament and the New Testament. The Old Testament is very similar to the Jewish Bible, but the books are arranged and numbered differently.

Not all Christian Bibles are exactly alike. Besides the 39 books of the Christian Old Testament, Roman Catholic and Eastern Orthodox churches include some books that are not accepted by Protestants. These books are known as the Apocrypha. The Jewish Bible does not contain the Apocrypha either.

Did You Know?

The word Bible comes from a word in the Greek language that means "book."



The books of the New Testament were originally written in Greek. The Greek text can be seen on a page from a Bible made in the 500s.

Christians created the New Testament after Jesus' death to help spread the message about Jesus to the world. The New Testament is thought to have been written between about AD 50 and 150. The New Testament has four sections: the Gospels, the Acts of the Apostles, the Epistles (letters), and Revelation.

The four books called the Gospels tell about Jesus' life and teachings. Each book is believed to have been written by one of Jesus' closest followers: Matthew, Mark, Luke, and John.

The Acts of the Apostles tell about the early history of the church and its messengers (apostles) after Jesus' death.

The Epistles are letters of advice and instruction. Saint Paul wrote most of them. All the letters were later copied and spread among the churches in the

Roman Empire to give followers solutions to local church problems and instructions on how to live a Christian life. The letters also gave interpretations of the Gospels.

The Book of Revelation describes the end of the world and the events leading up to it. It sends a message of hope to Christians, reminding them to keep their faith through trying situations because the Kingdom of God is near.

► More to explore

Christianity • Eastern Orthodox Churches • Jesus Christ • Judaism
• Protestantism • Roman Catholicism
• Torah

Bicycle

A bicycle, or bike, is a machine for getting from place to place. Most bicycles



Safe bicyclists always wear helmets.

have two wheels set in a frame. The frame includes handlebars for steering, a seat, and two pedals. Millions of people throughout the world ride bicycles for fun, for exercise, for sport (called cycling), and for transportation.

How a Bicycle Works

To ride a bicycle, the rider sits on the seat and places the feet on the pedals. The pedals are connected by a chain to the back wheel. When the rider pushes on the pedals, the back wheel turns. This moves the bicycle forward. The rider steers by turning the handlebars or by leaning.

Bicycles may have coaster brakes or hand brakes. On a bicycle with coaster brakes, a rider stops by pedaling backward. Hand brakes are controlled using levers on the handlebars. When a rider squeezes the levers, pads squeeze against the wheels and the bicycle stops.

Some bicycles also have gears, or speeds. Shifting, or changing, gears lets the rider keep a steady pedaling speed when traveling on different surfaces. Higher gears

make pedaling harder but allow the bicycle to go faster. A rider may shift the bicycle into a higher gear when riding on smooth, flat ground. Lower gears make pedaling easier but slow down the bicycle. A rider may shift to a lower gear when riding up a hill.

Types of Bicycles

There are six main types of bicycles: utility, mountain, hybrid, touring, racing, and bicycle motocross (BMX). Utility bicycles have heavy frames and usually one speed. Mountain bikes have wide tires, flat handlebars, and many speeds. They are good for riding on rough trails. Hybrid bicycles are like mountain bikes, but their tires are not as wide. They are good for both roads and off-road trails. Touring and racing bicycles have narrow tires, lightweight frames, curved handlebars, and many speeds. They are often called road bikes because they are best for riding on roads. BMX bikes are designed for racing on dirt tracks. BMX bikes have a small



Two men ride an early form of bicycle called an ordinary, or a penny-farthing.

frame, a low seat, high handlebars, and one speed.

History

The first machines similar to bicycles were invented in the early 1800s. They had no pedals. Later machines had pedals and front wheels that were much larger than the back wheels. The front wheels were about 5 feet (1.5 meters) tall. By about 1900 bicycles looked similar to the bicycles of today.

► More to explore

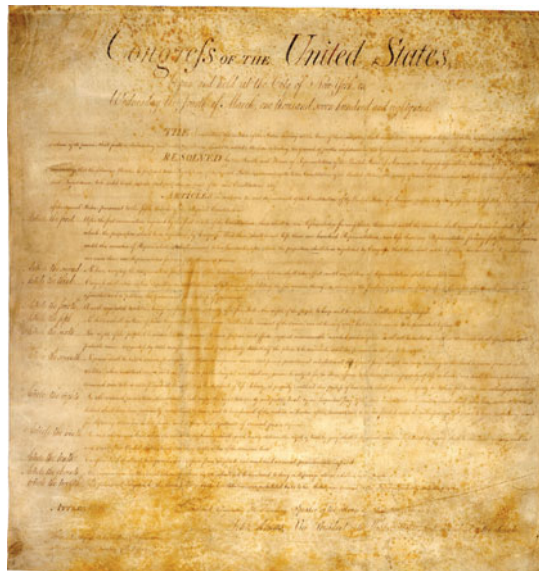
Cycling • Transportation

Big Tree

► see Giant Sequoia.

Bill of Rights

A written statement that explains the basic freedoms and rights of citizens is generally called a bill of rights. In the



The U.S. Bill of Rights became law in 1791.

United States, the first 10 amendments to the Constitution are called the Bill of Rights.

History

For most of human history there was no thought given to the rights of individual citizens. The king or other ruler often had complete power over the people. This began to change in the late Middle Ages. The nobles of England forced King John in 1215 to guarantee them certain rights. The document he signed was called the Magna Carta, or Great Charter.

Many years later people in some countries tried to change their governments so that the governments would represent the people and not just the king. They often drew up a bill of rights. England produced a Bill of Rights in 1689, and the French Declaration of the Rights of Man (1789) stated the principles of the French Revolution.

United States Bill of Rights

The U.S. Constitution of 1787 set up a government that was subject to majority rule. However, many people wanted to protect individual rights and limit government power. They put statements such as the Virginia Declaration of Rights (1776) into state constitutions. Their demands led lawmakers to add 10 amendments to the Constitution in 1791. Among other things, those amendments guarantee freedom of religion, freedom of speech, and the right to public assembly. The rights granted by the Bill of Rights are not absolute.

Decisions by judges have expanded some rights and reduced others.

Other Documents

In 1948 the United Nations accepted the Universal Declaration of Human Rights as a standard for all countries. Governments and international organizations have used the declaration to judge how well human rights are observed around the world.

► More to explore

Amendment • French Revolution
• Human Rights • Magna Carta
• United Nations • United States Constitution

Bin Laden, Osama

Osama bin Laden is the leader of the terrorist group al-Qaeda. A terrorist is a person who tries to control people through violence and fear. Bin Laden and others founded al-Qaeda in the late



Osama bin Laden

1980s. Their goal was to protect the religion of Islam and Muslim people.

Early Life

Bin Laden was born in 1957 in Riyadh, Saudi Arabia. He grew up in a large and very rich family. He attended King Abdul Aziz University and became an engineer.

Organizing al-Qaeda

In 1979 troops from the Soviet Union invaded Afghanistan, a Muslim country. Bin Laden went to Afghanistan to help fight the invaders. It was during this period that he helped found al-Qaeda. He returned to Saudi Arabia as a hero.

Soon after he returned the Persian Gulf War broke out. The Saudi government allowed troops from the United States to establish a military base there. Bin Laden was angry with his government for letting the U.S. troops into the country. He was also angry with the U.S. government because he believed that it was interfering in the Muslim world. He moved to Sudan to set up training camps in 1994. He later moved to Afghanistan.

Attacks

Al-Qaeda carried out attacks worldwide throughout the 1990s. On September 11, 2001, members of al-Qaeda hijacked four airplanes. They crashed three of them into the World Trade Center in New York City and the Pentagon near Washington, D.C. The fourth airplane crashed in a field in Pennsylvania. About 3,000 people died in these attacks.

Did You Know?

Osama bin Laden had more than 50 brothers and sisters.

Afterward U.S. forces invaded Afghanistan to try to capture or to kill bin Laden.

► More to explore

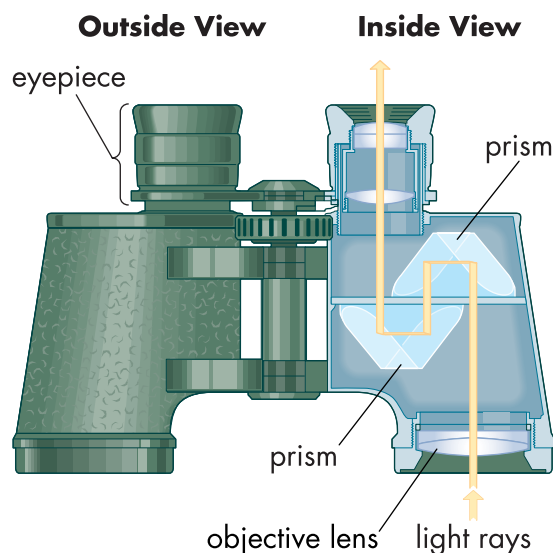
Terrorism

Binoculars

Binoculars, like telescopes, magnify far-away objects to make them easier to see. To magnify is to make something look bigger. People use only one eye to look through a telescope, but they use both eyes to look through binoculars. Using both eyes makes faraway objects look more real.

How Binoculars Work

Most binoculars contain a series of lenses and prisms. Lenses are circles of curved glass. Prisms are pieces of glass with several flat sides. The lenses and prisms change the direction of the light going through them. The lenses and



A cutaway view shows how light passes through the lenses and prisms of binoculars.



Many people at a horse race use binoculars to get a better view.

prisms together change the image of the object being viewed.

When someone looks through a pair of binoculars light enters through a lens, called an objective lens, in each side. The objective lenses turn the image being viewed upside down. Then the light passes through the prisms. The prisms turn the image right side up and reflect it toward eyepieces. Finally, the light passes through the eyepieces into the eyes. The lenses in the eyepieces make the image look bigger. A ring located between the eyepieces lets the user adjust the focus of the binoculars. Focusing makes objects look clearer. The ring works by changing the distance between the eyepiece and the prisms.

How Binoculars Are Used

There are different strengths of binoculars. High-powered binoculars can make faraway objects look six, eight, or even 10 times bigger than they really are. Such binoculars are often used for watching birds and wild animals. Low-

powered binoculars can make objects look three times bigger. They are handy for watching a sporting event or a play or concert in a theater.

The size of the lenses is important, too. Larger lenses allow more light to enter the binoculars. This makes them work better at night or in dim light. However, larger lenses are also heavier. This makes the binoculars harder to carry and harder to hold steady. Smaller lenses might not be best for night viewing, but they are easy to hold and to carry.

► More to explore

Lens • Prism • Telescope

Biology

Biology is the study of living things. A biologist is a scientist who studies biology. Biologists try to understand the natural world and the things that live in it. These things include plants, animals, fungi, protozoa, algae, bacteria, and viruses.

The study of biology covers many areas. It is usually divided into separate branches, or fields. Some biologists study anatomy, or the structure of living things. Some study physiology, or how the different parts of a body work together. Still others study ecology, or how organisms interact with their environment. There are many other branches as well.

In addition to these general fields, some branches of biology study certain types of living things. Some biologists study large groups, such as all animals (zoology) or all plants (botany). Others, however, only study specific groups, such as insects, birds, or mosses.

No one knows exactly when humans first began to study the natural world. Most biologists agree, however, that it was thousands of years ago. Many of today's ideas about biology started from the work of scientists who lived hundreds of years ago.

► More to explore

Anatomy • Botany • Ecology • Zoology

Did You Know?

During the 1900s, some of the biggest discoveries in biology had to do with a material called DNA. DNA is present in every cell of every living thing.

Biome

A biome is a large region of Earth that has a certain climate and certain types of living things. Major biomes include tundras, forests, grasslands, and deserts.

The plants and animals of each biome have traits that help them to survive in their particular biome. Plants and animals that live within smaller areas of a biome also depend on each other for



Biologists study an island gray fox on Santa Catalina Island near California.

Did You Know?

Not all deserts are hot. A cold desert covers part of Antarctica.

survival. These smaller areas are called ecosystems. Each biome has many ecosystems.

Tundras

The tundra biome is found in extreme northern regions. This biome has cold, dry conditions. The main plants include mosses, lichens, and short grasses. Arctic foxes, reindeer, and migrating birds are some common tundra animals.

Forests

Trees are the main plants in forest biomes. There are several different types of forest biome.

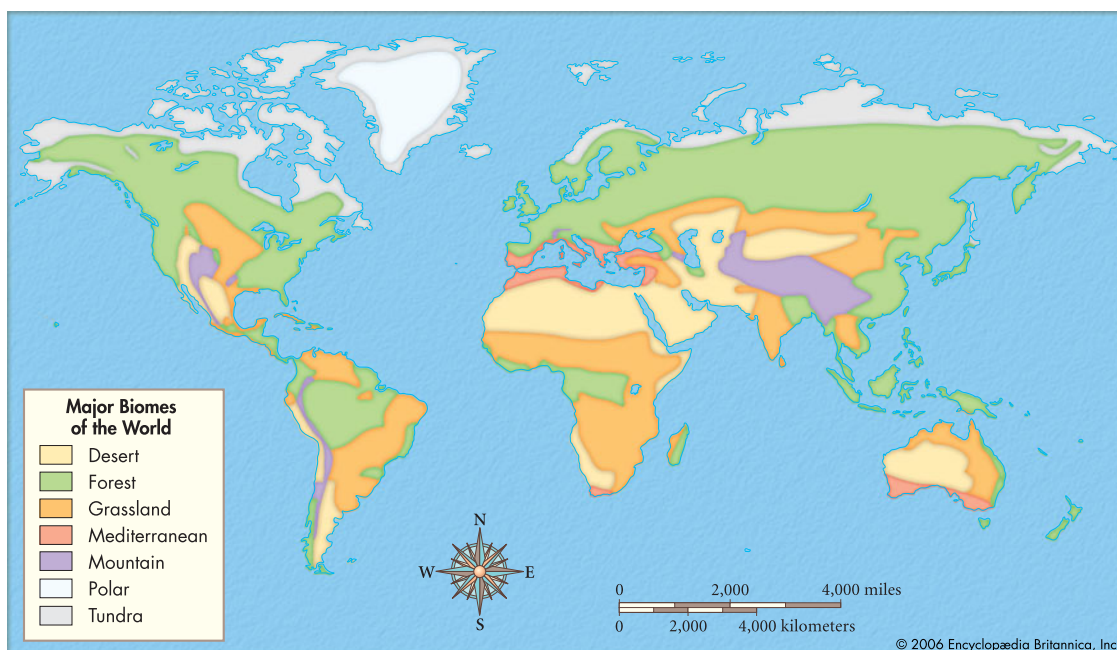
The taiga is a conifer forest biome. It lies just south of the tundra biome. The taiga has long, cold winters and short, mild summers. It gets more rain than tundras do, so it can support conifers. Conifers are trees with needles, such as spruces and firs. Lynx, timber wolves, moose, and beavers live in this biome.

Deciduous forests are found mainly in the Northern Hemisphere. This biome has cold winters and warm summers. The trees are deciduous, meaning that they shed their leaves in the fall. Deer, bears, bobcats, and squirrels are common to this biome.

Tropical rain forests lie near the equator. This biome has hot, wet conditions all year long. Tall, tropical trees and many other plants grow there. Monkeys, parrots, and anaconda snakes are some of the many rain forest animals.

Grasslands

Grassland biomes are places that get enough rain for grasses to grow but not enough to support forests. Temperate grasslands have hot summers and cold winters. Tropical grasslands, also known as savannas, are hot all year long. Prairie dogs and mule deer live in the temperate grasslands of North America. Giraffes, zebras, and lions live in the tropical grasslands of Africa.





Scientists in England created a humid tropical biome under a dome. It was part of a project to teach people about the relationships between plants and animals.

Deserts

Deserts are the driest biome. The largest desert, the Sahara, is in northern Africa. Deserts receive less than 10 inches (25 centimeters) of rain each year. Cacti and creosote bushes are two types of plant that can survive the dry conditions. Rattlesnakes, lizards, roadrunners, and owls are some of the animals of this biome.

► More to explore

Desert • Ecology • Forest • Grassland
• Rain Forest • Taiga • Tundra

Birch

The trees called birches have long been known for their beautiful bark. Native Americans used birch bark to make canoes, tepees, and moccasins. Today people use birch wood to make furniture, flooring, and plywood. Birches are also planted in parks and gardens.

Birch trees are found in the northern half of the world. They grow in areas with cool to cold weather.

There are about 60 species, or types, of birch. Some birches are shrubs, but most are trees. The monarch birch of Japan is one of the tallest birches. It grows to 100 feet (30 meters). Many birch trees in the United States are 40 to 70 feet (12 to 21 meters) tall. Birches have narrow trunks. Their bark is often white, and it has lines that go from side to side. Most young birch trees have bark that is easy to peel off.

Birch leaves are usually bright green. They turn golden yellow in the fall. Clusters of flowers grow on birches. They are called catkins. Some catkins look like miniature pinecones. These cones hold seeds. When the cone falls apart, the seeds scatter.



Birch trees are known for their white bark.

Birches can reproduce in several ways. Some birches grow from seeds. Others sprout from birch trunks or birch roots.

► More to explore

Bark • Tree

Bird



Many people keep parakeets or other birds as pets.

From pigeons in big cities to penguins in Antarctica, all birds have similar features. They all have wings, though they cannot all fly. All birds also have feathers. In fact, birds are the only living animals that have feathers.

Birds have fascinated people throughout history. Many people keep birds as pets or enjoy watching them in the wild or at zoos. In addition, farmers raise poultry for their meat and eggs. Hunters shoot some birds as game. People also use bird feathers in various products and for decoration.

Where Birds Live

Birds are found almost everywhere on Earth. There are more than 9,000 species, or types, alive today. Different types of bird have adapted to different habitats, from deserts to rain forests to icy lands to cities.

Many birds migrate, or fly long distances between their winter and summer homes. For example, many European birds travel to Africa for the winter. This helps them find enough food year-round.

Physical Features

Birds are warm-blooded. This means that their body temperature stays about the same, regardless of the temperature of their surroundings. Mammals, including humans, are also warm-blooded. However, birds are more closely related to the group of cold-blooded animals called reptiles than they are to mammals. In fact, many scientists think that birds developed from dinosaurs, which were reptiles, millions of years ago.

Size and Color

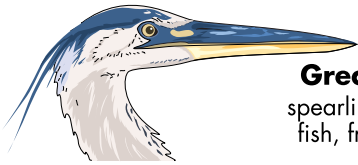
Birds vary greatly in size. The bee hummingbird is the smallest living bird. It is only about 2.5 inches (6.3 centimeters) long and weighs less than 0.1 ounce (3 grams). The largest living bird is the ostrich. Some male ostriches can stand 8 feet (2.5 meters) tall and weigh 300 pounds (135 kilograms).

Feather colors range from drab to very bright. In many species the male is more brightly colored than the female. The female's dull coloring may help it remain hidden in the nest. In some cases, the brightly colored male perches a short distance away from the nest. In this way, the male bird draws the attention of enemies to himself and away from the eggs and young. The male's

Did You Know?

There were no house sparrows, starlings, or domestic pigeons in North America before Europeans arrived. Settlers brought the birds from Europe.

Bills Tell How a Bird Feeds



Great Blue Heron
spearlike bill for jabbing
fish, frogs, and shellfish



Whimbrel
long, down-curved
bill, used to get worms
and crabs out of sand



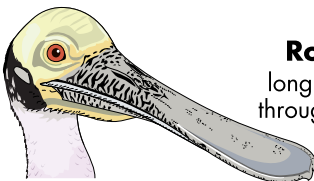
Red-Tailed Hawk
short, strong bill,
hooked for tearing flesh



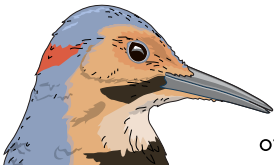
Hooded Merganser
long, narrow bill with
toothlike parts for catching
fish and draining water



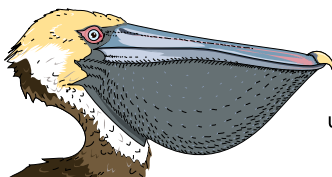
Northern Cardinal
heavy, cone-shaped bill
for cracking seeds



Roseate Spoonbill
long, flat bill for swinging
through water to catch fish



Northern Flicker
long, chisel-like bill,
used to dig insects out
of soft wood or the ground



Brown Pelican
very long bill with
large throat pouch,
used to scoop up fish

Birds have different kinds of bills to help them eat different kinds of food.

showy coloring may also help it to attract a mate.

Flight and Basic Structure

Most birds can fly. They are able to do so because of their body structure and feathers. Flying birds are strong but light. Their powerful chest muscles help them flap their wings. Many of their bones are hollow, which keeps them light. Their compact bodies narrow toward the ends like jet airplanes. Air flows smoothly over their feathers while they fly.

However, a few types of bird cannot fly. Penguins have paddlelike wings that are useless for flying. But their wings help them swim well. Ostriches and similar flightless birds have small wings and weak chests. They walk or run everywhere on their strong legs. Most other kinds of bird can walk (or swim) and fly.

Every bird has two legs, two feet, and a bill. Many birds have a pouchlike area of the throat called the crop. The crop is used to store food. Many birds also have a gizzard, a part of the stomach that grinds up food. Birds lack teeth, so they cannot chew their food.

Feathers

Feathers help birds fly and protect them from water, heat, and cold. Birds rearrange and clean their feathers regularly. Most kinds also apply oil to the feathers from a gland near the tail. Water slides off the oiled feathers instead of soaking through. At least once a year birds shed

their old feathers and grow new ones. This process is called molting.

Senses

Birds have sharp eyesight. For instance, an American kestrel flying 100 feet (30 meters) above a field can spot a grasshopper on the ground below. However, birds generally have a narrower range of hearing than humans do. Their sense of smell is usually not highly developed.

Behavior and Feeding Habits

Some types of bird live alone most of the time. Other types are more social. They may feed, sleep, fly, and nest in groups called flocks.

Birds use many different sounds to communicate with one another. For example, some baby chicks stop moving when their mother produces a danger call. Birds may sing to attract mates. They may also sing to announce that a certain patch of land belongs to them.

Birds eat a wide variety of foods. Many types eat insects. Some waterbirds catch fish. Birds of prey catch many kinds of animals, including other birds. Some birds, such as vultures, feed on dead animals and garbage. Many other types eat plant material, such as seeds and fruits.

Reproduction

Most birds breed at least once a year. Many types build nests for their eggs. A nest can range from a scrape in the sand to a cup of twigs and mud to a complex



An American robin brings a worm to its hungry young.

hanging basket. The female bird lays a set of anywhere from 1 to 20 eggs, depending on the species.

Most birds sit on their eggs to keep them warm. This process is called incubation. The eggs hatch into young birds in about 11 to 80 days, depending on the species. Some young birds can feed themselves almost immediately. Other types depend on their parents to provide their food for a time.

► More to explore

Animal • Dinosaur • Feather
• Migration, Animal • Pet • Poultry

Bird, Flightless

Millions of years ago, all birds could fly. But as time passed, some birds became flightless. That is, they lost the ability to fly, though they still have wings.

Why Some Birds Do Not Fly

Scientists do not agree on how some birds became flightless. One idea has to do with where the birds lived. The first flightless birds may have appeared in isolated places, or places cut off from the rest of the world. Birds living in these isolated spots, like islands, found no enemies. For that reason, they did not need to fly to stay alive. So, as these birds evolved, or developed over thousands of years, they gradually lost their ability to fly.

Flightless Birds Today

The largest flightless birds are the ostriches of Africa. Rheas, emus, and cassowaries are other large flightless birds. Rheas live in South America, emus live in Australia, and cassowaries live in Australia and New Guinea. All these birds are about 5 feet (1.5 meters) tall and have very strong legs.

Kiwis and penguins are two kinds of smaller flightless birds. Kiwis are about the size of a chicken. They live in New Zealand. Penguins can be up to about



The flightless kiwi lives in New Zealand.

3.5 feet (1 meter) tall. They live mainly in Antarctica.

Extinct Flightless Birds

Some flightless birds are extinct, or completely wiped out. Huge elephant birds lived on the island of Madagascar, off the east coast of Africa. These birds sometimes reached a height of 10 feet (3 meters) and a weight of about 1,000 pounds (450 kilograms). Elephant birds disappeared within the last 1,000 years.

Moas lived on the islands of New Zealand. In about AD 1250 people arrived and began to hunt them for food. Moas died out by about 1350.

Dodos lived on Mauritius, an island in the Indian Ocean. Sailors arrived in about 1507 and began to hunt dodos. The flightless birds made their nests on the ground, so their eggs were unprotected, too. Pigs and rats, which came with the people, easily found the eggs and ate them. Dodos became extinct by about 1690.

► **More to explore**
Bird • Ostrich • Penguin



Two young emus graze in a field with an adult.

Bird of Prey

Several kinds of bird that eat animals are known as birds of prey. Some common birds of prey include eagles, falcons, hawks, ospreys, owls, buzzards, and vultures. Birds of prey are found all over the world. They are sometimes called raptors.

Birds of prey are usually large and strong. Most are excellent hunters. Their good eyesight helps them see prey from far away. Most of the birds have hooked beaks and sharp claws that are useful for holding and killing prey. Most birds of prey feed during the day and sleep at night. Owls, however, hunt at night and sleep during the day.

Birds of prey eat a great variety of animals. Some kinds eat other birds. Some eat insects, fish, rodents, snakes, frogs, or other animals. A few kinds look for animals that are already dead to eat. Vultures, for instance, hardly ever hunt live animals.



The common buzzard uses its claws to grasp prey and its beak to tear flesh.



A screech owl holds a frog it has just caught.

Many birds of prey keep the same mate for their whole lives. Most kinds build nests in trees, on ledges of cliffs, or on the ground. They usually lay one to four eggs. Owls, however, may lay up to 12 eggs at a time. Most eggs are white or greenish in color and have spots.

Birds of prey are helpful to people because they eat dead animals and kill rodents and other pests. But some people kill the birds. They fear the birds will eat their livestock. And over the years people have cut down many trees. This has limited the areas where the birds can live and find food. Chemicals that people use to kill pests have also harmed birds of prey. Several kinds are in danger of dying out, or becoming extinct.

► More to explore

Bird • Endangered Species

Bishkek



Population
(1999 census)
762,308

Bishkek is the capital of Kyrgyzstan, a country of central Asia. Rivers flow on two sides of the city center. Bishkek is the largest city in Kyrgyzstan. It is also the country's center of culture and industry. Factories in Bishkek make machines and work metals.

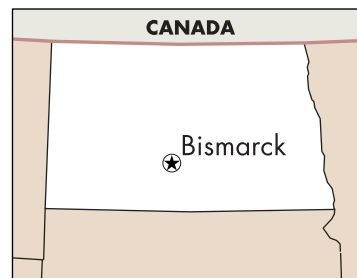
Bishkek began in 1825. In that year the ruler of the Uzbek people built a fort on the site. A town gradually grew up around the fort. The Russians captured it in 1862. In 1926 the city became the capital of the newly created Kyrgyz republic of the Soviet Union. The Soviets called the city Frunze. In 1991 Kyrgyzstan became an independent country.

The city remained the capital, but it was renamed Bishkek.

► More to explore

Kyrgyzstan

Bismarck



Population
(2000 census)
55,532; (2007
estimate)
59,503

Bismarck is the capital of the U.S. state of North Dakota. The city lies on the Missouri River. Bismarck is the state's center of business and finance. It is also a center for the sale of grain and live-stock.

Native American groups lived in the region for thousands of years. In the 1830s the site of Bismarck became a river port called "Crossing on the Missouri."

The U.S. Army built a fort on the site in 1872. A settlement sprang up near the fort. It was named Bismarck in 1873. The following year gold was discovered in what is now South Dakota. Many gold seekers bought equipment in Bismarck before setting out on their adventures. The city grew in population and wealth.

In 1883 Bismarck became the capital of the Dakota Territory. In 1889 the territory was split into two states—North



An elderly man walks past a government building in Bishkek.

and South Dakota. Bismarck became North Dakota's capital.

► **More to explore**

North Dakota

Bison

Bison are the largest land mammals in North America and Europe. There are two species, or types, of bison: the American bison and the European bison. The animal commonly called the American buffalo is actually the American bison. It is also called the plains bison. The European bison is also called the wisent. The true buffalo are a different group of animals found in Africa and Asia. Bison are closely related to buffalo, cattle, and yaks.

Where Bison Live

Both types of bison once existed in much greater numbers. Tens of millions of American bison roamed the western plains in what are now Canada and the United States. They were important animals to the Plains Indians. The European bison once lived throughout most of Europe. Over time settlers and hunters killed millions of both types of bison. By the early 1900s both species were



American, or plains, bison



A herd of bison runs through a state park in South Dakota.

endangered, or in danger of dying out. Since then people have worked to save these animals.

Today the American bison is found mainly in protected areas such as national parks. It is no longer endangered. Small numbers of European bison can be found in parts of eastern Europe, especially Poland, Belarus, Ukraine, and Russia. It is still an endangered species.

Physical Features

Bison are large, powerful animals. An adult male American bison stands about 6.5 feet (2 meters) tall at the shoulder. It may weigh about 2,000 pounds (900 kilograms). The females are smaller. The European bison is slightly larger than the American bison but is not as heavily built.

Bison have huge heads and a hump at the shoulders. Two short horns curve upward. They have hooves on all four feet. Bison have shaggy brown fur. The fur is usually longer on the head, neck, and shoulders.

Behavior

Bison eat mainly grasses. They usually move with a plodding walk. But they can also run at speeds of about 40 miles per hour (65 kilometers per hour). Bison usually live in small groups. Sometimes dozens or even hundreds of groups come together to form large herds.

► More to explore

Buffalo • Cattle • Endangered Species
• Mammal • Yak

Bissau



Population
(2004 estimate)
305,700

Bissau is the capital of the West African country of Guinea-Bissau. The city lies on the Atlantic Ocean at the mouth of the Geba River. It is the country's largest city and main port. Factories in Bissau process coconuts, cashews, and rice.

The Portuguese founded Bissau in 1687 as a fort and center for trading slaves. Over the next 200 years several European countries struggled for control of the city and its port. Portugal made all of what is now Guinea-Bissau into a colony by 1915. Bissau became the capital of the colony in 1941. In 1974 Guinea-Bissau became an

independent country. Bissau remained its capital.

► More to explore

Guinea-Bissau

Bivalve

Bivalves are animals that have a shell with two halves called valves. The word bivalve means "two valves." Bivalves are part of a larger group called mollusks. Mollusks are a type of animal with a soft body.

There are about 8,000 species, or kinds, of bivalve. They include scallops, cockles, clams, oysters, and mussels. Most bivalves live in the ocean, but a few species live in freshwater.

Physical Features

Bivalves vary greatly in size, shape, and color. Tiny freshwater shells may be only 0.06 inch (1.5 millimeters) long. Giant clams in the southern Pacific Ocean may be more than 4 feet (1.2 meters) long



Scallops are a type of bivalve. Most kinds of scallop shells are shaped like fans.

and weigh more than 500 pounds (225 kilograms).

A bivalve's shell protects its soft body. Muscles connect the two valves of the shell on one side. These muscles allow the shell to close quickly and tightly. When a bivalve relaxes the muscles, the shell opens.

A bivalve's body includes a nervous system, a digestive system, and a heart. Bivalves have gills instead of lungs. When a bivalve opens its shell, water washes over the gills. The gills then strain out oxygen and food particles.

Behavior

Different bivalve species live in different ways. Oysters and ocean mussels spend their lives attached to solid, underwater surfaces, such as rocks on the ocean floor. Some bivalves, such as scallops, swim by clapping their valves together. This pushes water out of the shell and moves them forward. Clams and freshwater mussels move around with a muscular "foot." The foot is shaped like a blade. These bivalves escape enemies by using it to dig into sand.

Uses

Bivalves are an important source of food for fish, birds, and people. People also make jewelry and crafts out of the shells. The shiny material of some shells, called mother-of-pearl, can be made into buttons or other decorations. Some bivalves build shiny round beads around particles of dirt that enter their shells.

People make jewelry out of these beads, which are called pearls.

► More to explore

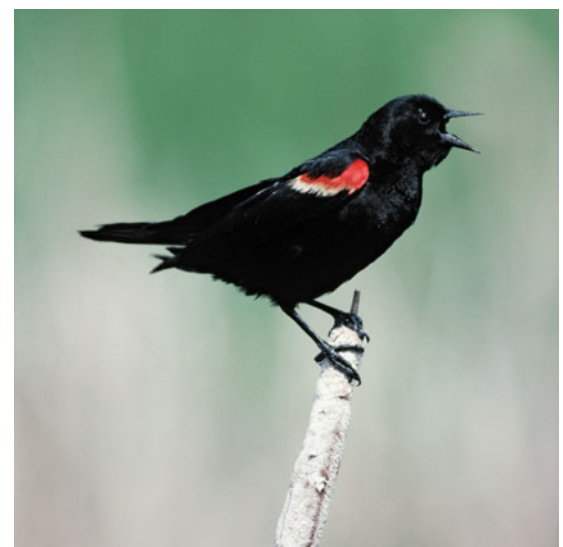
Mollusk • Shell

Black Americans

► see African Americans.

Blackbird

There are many species, or types, of blackbird—songbirds named for the black color of the males' feathers. The Old World, or common, blackbird is related to thrushes, robins, and bluebirds. All other types of blackbird are in the same scientific family with grackles, cowbirds, orioles, and meadowlarks. The best-known types are the red-winged blackbird and the yellow-headed blackbird. Although crows and ravens also have black feathers, those birds are not called blackbirds.



The red-winged blackbird is found in North America and Central America.

Did You Know?

Early humans used scallop shells as dishes.

The Old World blackbird lives in woods and gardens in Europe, Asia, New Zealand, and Australia. Most types of blackbird, however, are found in North America. They live in marshes, fields, prairies, woods, and towns.

Blackbirds generally range from about 8 to 11 inches (20 to 28 centimeters) in length. Among Old World blackbirds the males are black and the females are brown. This is true of many blackbirds. Often the males also have some brightly colored or dark, glossy feathers. The male red-winged blackbird has yellow and red feathers on its shoulders. The female is brown and streaky like a sparrow. The male yellow-headed blackbird has a bright yellow head and a black body. The female has a dull yellow head and a gray-brown body.

Most blackbirds eat mainly insects and grains and other seeds. They often look for food on the ground in large groups. The Old World blackbird eats insects, worms, and fruits.

► More to explore

Bluebird • Cowbird • Robin • Songbird

Blackfoot

The Blackfoot (also called Blackfeet) are a group of three Native American tribes—the Piegan, the Blood, and the Blackfoot proper (also called Northern Blackfoot). The Blackfoot were most powerful in the early 1800s. At that time they controlled a large area of land in the United States and Canada from Montana to Alberta and Saskatchewan.



Children from the Blackfoot tribe wear colorful traditional clothing.

The Blackfoot got most of their food by hunting bison (buffalo). They lived in portable cone-shaped tepees made from a wooden frame covered with bison hides.

European traders arrived in the Blackfoot's territory in the late 1700s. The Indians were friendly to these newcomers until 1806, when the Lewis and Clark Expedition killed two of their warriors. Afterward the Blackfoot considered Americans to be their enemies, and they attacked traders, miners, and settlers.

The Blackfoot suffered from diseases such as smallpox that were introduced by the Europeans. Non-Indians also killed nearly all the bison of the Plains. This left the Blackfoot without their most important source of food.

Unable to live as bison hunters, the Blackfoot agreed to move to reservations. By the end of the 20th century, about 32,000 Blackfoot lived in the United States, mostly in Montana.

Another 12,000 lived in Canada, primarily in Alberta.

► More to explore

Lewis and Clark Expedition • Native Americans

Black Hawk



Chief Black Hawk led his people, the Sauk tribe, in a fight against white settlers.

A chief of the Sauk people, Black Hawk led a band of 1,000 Native Americans who refused to be forced from their homeland by white settlers. In 1832 their struggle sparked the brief Black Hawk War.

Black Hawk was born in 1767 near the mouth of the Rock River in what is now the U.S. state of Illinois. His Indian name was Ma-ka-tai-me-she-kia-kiak. Black Hawk resented the coming of American settlers and fought with the British against the United States in the War of 1812.

While Black Hawk was away, Keokuk became leader of the Sauk. Keokuk was friendly with U.S. officials. His followers agreed to move across the Mississippi River into what is now Iowa. Black Hawk and his followers resisted, but they were forced to move to Iowa in 1831. The next spring, however, they returned to their homeland. President Andrew Jackson then sent troops.

Black Hawk did not get the help he needed from other tribes. The U.S. troops drove his band north into what is now Wisconsin. In the final battle of the Black Hawk War, the troops killed most of the Indians at the Bad Axe River. Black Hawk survived and was sent to prison. In 1833 he was allowed to return to Iowa. He died there in 1838.

► More to explore

Jackson, Andrew • Native Americans
• War of 1812

Black Hills

The Black Hills of the west-central United States are abundant in natural beauty. The hills were home to Native





Mount Rushmore National Memorial rises above the forested slopes of the Black Hills.

Americans until the area became the center of a gold rush in the late 1800s. Today they attract millions of visitors from all over the world.

The Black Hills lie largely within the Black Hills National Forest of western South Dakota and northeastern Wyoming. From a distance their rounded hilltops and heavily forested slopes look dark, which is why they are named the Black Hills. The hills rise approximately 3,000 feet (900 meters) above the surrounding Great Plains.

The Black Hills contain many tourist attractions. Mount Rushmore National Memorial in South Dakota features huge carvings of Presidents George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt. South Dakota's Custer State Park is home to a large herd of roaming bison. Other attractions in South Dakota include Jewel Cave National Monument, Wind Cave National Park, and the old mining town of Deadwood.

Devils Tower National Monument is in Wyoming.

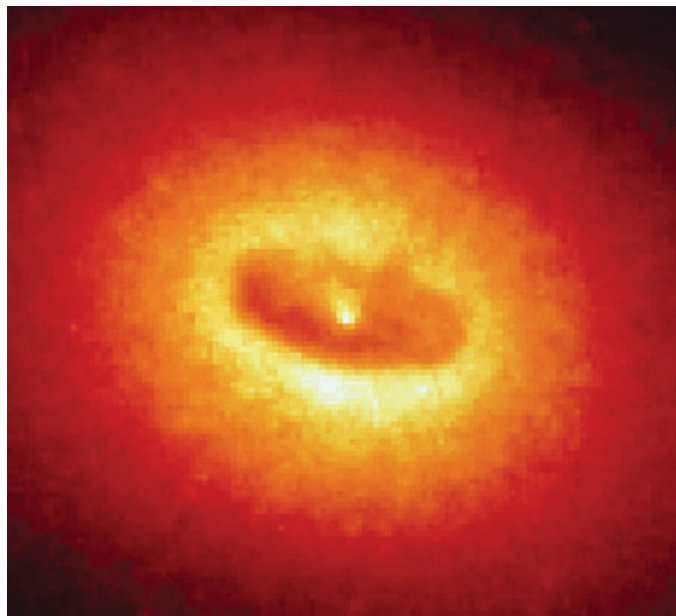
The Black Hills were once a hunting ground and sacred territory of the Sioux Indians. A treaty signed in 1868 gave the Sioux rights to the region. However, white miners rushed into the hills after gold was discovered in 1874. In 1876 the Indians fought U.S. troops in the Black Hills War. After being defeated, the Indians were forced to leave the hills.

► More to explore

Gold Rush • Sioux

Black Hole

A black hole is an area in space with an incredibly strong force called gravity. This gravity pulls in everything that gets close. Nothing, not even light, can



A picture from the Hubble Space Telescope shows a huge ring of gas and dust in space. Scientists think the ring may surround a black hole.

escape from a black hole once it has been pulled in.

Black holes are not actually holes. They have great amounts of material packed in very tightly. They are remarkably heavy for their size. This gives black holes their strong inward pull. They are called “black” because they are invisible. That is because no light can bounce off a black hole. All the light that gets near one is trapped inside.

Finding a Black Hole

Because no one can see black holes, they are hard to find. Scientists detect black holes by noting their effects on objects nearby. For example, just before material enters a black hole, it gives off many waves of energy called X-rays. Scientists can detect those X-rays.

How Black Holes Form

A black hole can be formed when a huge star uses up its fuel. A star is normally a huge ball of a gas called hydrogen, which serves as fuel for the star. The star constantly changes the hydrogen into other gases and in the process makes energy. The energy pushes outward. At the same time, the star’s gravity pulls inward. This balance of pushing and pulling keeps the star about the same size. However, when a star runs out of hydrogen, it cannot make the energy that pushes outward. Gravity continues to pull the star in on itself. If the star is very large, its gravity is very strong. The gravity crushes the star smaller and smaller, and it becomes a black hole.

Scientists think that black holes can also be formed in other ways, but they do not know for certain how this happens. They believe that a huge black hole lies at the center of nearly every galaxy, or group of stars, gases, and dust.

► More to explore

Galaxy • Gravity • Star

Black Sea

The Black Sea lies in the southeastern part of Europe. It is roughly oval in shape. Though far inland, it connects with the Atlantic Ocean through a series of other waterways. The Bosphorus Strait, the Sea of Marmara, and the Dardanelles Strait link the Black Sea to the Aegean Sea, the Mediterranean Sea, and finally, the Atlantic.

The Black Sea is located where Europe and Asia meet. It is bordered by Ukraine to the north, Russia to the northeast, Georgia to the east, Turkey to the south, and Bulgaria and Romania to the west. Several great rivers empty into the Black Sea. These include the Danube, Dniester, Bug, Dnieper, Don, and Kuban. The





The ruins of an old fort lie near the Black Sea in Turkey.

Crimean Peninsula juts into the Black Sea from the north. The sea covers about 163,000 square miles (422,000 square kilometers).

The Black Sea is important for transportation year-round. It is the starting point for the shipment of goods from eastern Europe to the rest of the world. The magnificent climate and mineral springs around the Black Sea have made it a major health and vacation center. The Crimea is the most popular region for visitors.

► More to explore

Aegean Sea • Crimea • Mediterranean Sea

Blackwell, Elizabeth

Elizabeth Blackwell was the first woman to become a doctor in the United States. During Blackwell's life few people would accept the idea of a woman doc-

tor. As a result Blackwell had to struggle all her life to practice medicine.

Early Life

Elizabeth Blackwell was born on February 3, 1821, in Bristol, England. Her family moved to the United States when she was 11 years old. When she was about 24 years old she decided she wanted to become a doctor.

Blackwell applied to many medical colleges, but none of them would allow a woman to study there. Finally, in 1847, Blackwell was accepted by Geneva Medical College in Geneva, New York. She graduated two years later at the top of her class. Blackwell then traveled to Paris, France, where she worked at a hospital for women. She continued her medical studies in England.

Career

In 1851 Blackwell traveled back to the United States, but no hospital would



Elizabeth Blackwell

hire her. She started a small clinic for the poor in New York City. In 1857 the clinic became the New York Infirmary for Women and Children. In 1868 Blackwell opened the Woman's Medical College at the New York Infirmary.

In 1869 Blackwell moved to England. She helped to set up the National Health Society. She also served as a professor at the London School of Medicine for Women from 1875 to 1907. Blackwell died in England on May 31, 1910.

► More to explore

Medicine

Blimp

► see Airship.

Blindness

People who are not able to see have a condition called blindness. Blindness can affect one or both eyes. Some blind people have no sight at all. Others can see light and shadows or blurry shapes.

Color blindness is a different kind of condition. Color-blind people have trouble telling colors apart. Some can see no color at all. Color blindness is inherited, or passed on from one generation to another.

Causes

Sometimes blindness is inherited. An injury to the eyes or the brain may also cause blindness. However, a number of diseases and disorders are the main

causes of blindness. These include cataracts, glaucoma, macular degeneration, and diabetes mellitus.

A cataract is the clouding of the lens of an eye. Glaucoma is a disease that can damage the optic nerve, which connects the eye to the brain. Macular degeneration is a disease that damages the retina, or the lining of the eye. Diabetes mellitus is a disease of the body that can also damage the retina. All these problems cause blindness mainly in older people.

Prevention and Treatment

Proper medical care can prevent or cure some common types of blindness. For example, doctors can treat glaucoma with special eye drops or surgery. Doctors can use surgery to treat cataracts, too. They remove the clouded lenses and replace them with artificial (man-made) lenses.



A blind mountain climber crosses a temporary bridge on the way to the top of Mount Everest.

Did You Know?

A disease called river blindness is a serious problem in parts of Africa. It is caused by a small worm that is spread to humans by the bite of the black fly.

Sometimes blindness cannot be prevented or treated. Nevertheless, many blind people are able to live on their own. Some have specially trained guide dogs that help them to get around. Many can read books and signs that are printed in Braille. This is a code of raised dots that people read with their fingers.

► More to explore

Braille • Eye

Bloemfontein



Population
(2005 estimate)
379,000

The country of South Africa has three capitals—Bloemfontein, Pretoria (Tshwane), and Cape Town. Bloemfontein is the judicial capital, or where the country's highest court meets. The city's name means "fountain of flowers." It is known for its many parks and gardens.

Bloemfontein is a center of South Africa's transportation systems. Many people in the city work in government offices or tourism.

The British founded Bloemfontein in 1846 as a fort and settlement. The British and the Boers were struggling for control of the area. The Boers were



Gardens surround a court building in Bloemfontein, South Africa.

descendants of earlier Dutch settlers. Bloemfontein became the area's capital under the British and later the Boers. South Africa became an independent country in 1910. Bloemfontein was made its judicial capital. In 2000 Bloemfontein was combined with some nearby towns to create a larger area called Mangaung.

► More to explore

Cape Town • Pretoria • South Africa

Blood

In humans and many other animals, blood is a liquid that carries nutrients and removes waste. Blood moves through the body's cardiovascular system. This includes the heart and a vast network of blood vessels. The heart pumps blood through the blood vessels to all parts of the body.

Structure

Blood cells make up about half the volume (amount) of blood. These cells form inside bone marrow, which is a soft



Blood is an important part of the body, but people can lose a small amount of their blood and feel fine. Doctors can examine a patient's blood to tell if they have a particular disease. People can also give some of their blood to others who may need extra blood.

tissue inside bones. There are three main types of blood cell: red cells, white cells, and platelets.

Red blood cells are the most numerous kind of blood cell. Their main job is to transport oxygen. In each cell, an iron-rich substance called hemoglobin carries the oxygen. Hemoglobin and oxygen together give blood its red color.

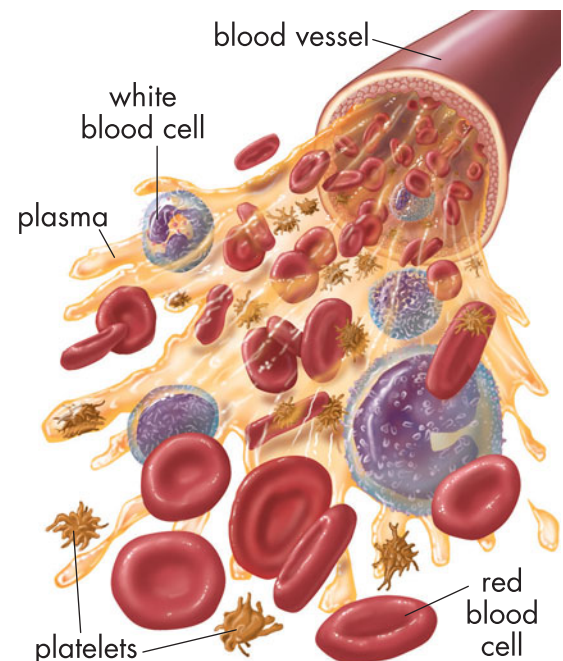
White blood cells, or leukocytes, help to keep the body healthy. Some swallow up tiny living things called bacteria or other foreign substances. Others release proteins that attack invading substances. Still others help to break down and remove dead cells.

Platelets are the smallest of the blood cells. They are able to stick to one another and form blood clots. Clots plug holes that may develop in the walls of blood vessels. This helps to stop bleeding.

The watery part of the blood is the plasma. Most of the plasma is water. Plasma also contains nutrients, chemicals, hormones, and wastes.

Functions

As blood passes through the lungs it picks up oxygen. The oxygen-rich blood then travels throughout the body. The body's cells take in this oxygen. In exchange, they send a gas called carbon dioxide into the blood. The blood carries the carbon dioxide back to the lungs, which push the gas out of the body.



Blood is made up of red blood cells, white blood cells, platelets, and plasma.

Blood also carries nutrients (proteins, fats, sugars, salts, vitamins, and minerals) to the body's cells. It takes away various wastes made by the cells. The kidneys, spleen, and liver clear the blood of wastes.

► More to explore

Cardiovascular System

Blueberry

Blueberries are small, dark blue fruits that grow on bushes. They have a mildly tart taste. Blueberries are eaten fresh or used to make bakery goods and jams. They contain vitamin C, vitamin A, and iron.

Blueberry bushes are found in woods and hilly areas of North America, Great Britain, northern Europe, and Asia. In the United States blueberries are grown in Maine, New Jersey, Michigan, and North Carolina.

Blueberry bushes produce flowers in the spring. Each flower develops into a single berry. For this reason botanists (people who study plants) consider blueberries to be true berries. Cranberries are also true berries. Some other berries, such as strawberries and raspberries, are actually clusters of small fruits that grow from a single flower.

Blueberry bushes tend to produce too much fruit. This limits the size of the fruit. It also increases the time that it takes the fruit to grow to full size. Growers remove some flower buds from blueberry bushes to allow larger berries to



Blueberries are considered true berries because of the way they develop. They start as flowers, and each flower on a blueberry bush produces a single berry.

grow in a shorter time. Growers also have improved the plants to produce better-tasting fruit.

► More to explore

Berry • Cranberry • Fruit

Bluebird

Bluebirds are songbirds named for the males' bright blue feathers. The soft whistles of their song are among the



The western bluebird is one of three types of bluebird.

earliest sounds of spring in North America. Bluebirds belong to the thrush family. This means that they are related to thrushes, robins, and nightingales. There are three species, or types, of bluebird: the eastern bluebird, the western bluebird, and the mountain bluebird.

Bluebirds are found in fields, orchards, parks, and gardens. Eastern bluebirds live in eastern Canada and the eastern United States. The western and mountain types are found in western Canada and the western United States. Many bluebirds avoid cold winters by flying south for the winter. Some of the birds fly as far south as Mexico.

Most bluebirds are about 7 inches (18 centimeters) long. The males are mostly blue, while the females are mostly bluish gray. The male eastern and western types have rusty-red-colored breasts. The females of those types have dull orange breasts. Bluebirds have slender bills, which they use to eat insects and fruit.

Bluebirds build their nests in holes, such as in trees, fence posts, or nest boxes that people make. The female lays four to six eggs at a time.

► More to explore

Nightingale • Robin • Songbird

Blue Ridge Mountains

The Blue Ridge Mountains are a segment of the Appalachian Mountains in



the United States. They extend from Pennsylvania through parts of Maryland, Virginia, North Carolina, and South Carolina to Mount Oglethorpe in Georgia. The range is quite narrow, only 5 to 65 miles (8 kilometers to 105 kilometers) wide, and has average heights between 2,000 and 4,000 feet (600 to 1,200 meters). The range includes the Black, Great Smoky, and Unaka mountains.

The Blue Ridge spreads through several national forests. The Shenandoah National Park in northern Virginia and the Great Smoky Mountains National Park also lie in the Blue Ridge. The Blue Ridge Parkway is a scenic highway established in 1936 that extends through the Appalachian Mountains in Virginia and North Carolina. It covers 142 square miles (368 square kilometers).

The Blue Ridge region is rather isolated. Many people in this area work in tobacco production, cattle raising, and truck farming. The forests in the ridge are a rich source of timber. The



The Blue Ridge Mountains are covered with forests in most places. A haze that often hangs over the forests gives the mountains their blue color.

Blue Ridge region is known to have more than 700 varieties of trees and plants.

► **More to explore**
Appalachian Mountains

Blues

The blues is a type of American music that became popular in the early 1900s. It is closely related to jazz. Instrumental music is important in the blues. Guitar, piano, and harmonica are typical blues instruments. But singing plays the key role in many songs. Rather than simply tell a story, blues singers express their feelings. These feelings are often sad.

Often the blues singer sings the first part of a line of music. The instruments then repeat or “answer” the part the singer sang. Blues performers make up parts of the music while performing it, within certain rules. This is known as improvisation.

The blues developed from the folk music of black people in the American South. That music included songs that blacks sang while working in the fields during the time of slavery. Later, in the early 1900s, the black bandleader W.C. Handy wrote blues songs that helped make the style popular. In the 1920s black singers such as Mamie Smith, Ma Rainey, and Bessie Smith made the first blues recordings.

In the first half of the 1900s many blacks moved from country areas in the South to cities in the North. They brought the blues with them. Musicians in Chicago played the biggest role in developing urban, or city, blues.

Famous blues performers include Riley “B.B.” King, John Lee Hooker, Muddy Waters, and Buddy Guy. Blues music has greatly influenced several other musical styles, including jazz, rock, and soul.



B.B. King is a well-known blues guitarist and singer.

► **More to explore**
Folk Music • Jazz • Popular Music
• Rock Music

Blume, Judy



Judy Blume

The U.S. author Judy Blume writes popular books for children and young adults. Her books are read all over the world. They have been published in more than 20 languages.

Blume was born on February 12, 1938, in Elizabeth, New Jersey. Her name was originally Judy Sussman. Blume was her first husband's last name. In 1961 she graduated from New York University with a degree in education. Her first book, *The One in the Middle Is the Green Kangaroo*, was published in 1969.

Blume's books contain language, situations, and concerns that feel real to kids. Her books talk about adolescence in an honest, understandable way. Blume became famous when her novel *Are You There God? It's Me, Margaret* was published in 1970. Blume used her own memories of growing up to write the book.

Many young readers liked how Blume wrote realistically about their concerns. However, some adults thought that

Blume's books were too direct in their discussion of sensitive subjects. They did not want the books to be available to children. Some people tried to have Blume's books removed from schools and libraries.

Blume's experiences led her to speak out against the banning of books. Blume also started the Kids Fund, which encourages parents and children to talk openly with each other.

Boa Constrictor

The boa constrictor is a large nonpoisonous snake. It kills its prey by coiling around it so tightly that the animal cannot breathe. Despite this deadly strength, the boa constrictor has become a popular pet. These snakes normally have mild tempers. They belong to the boa family, along with anacondas, tree boas, and many other types of snake.

Boa constrictors can be found in Central and South America. They live in a vari-



A boa constrictor coils around a tree branch.

ety of habitats, including tropical rain forests, grasslands, and drier areas.

Boa constrictors have thick, muscular bodies. Most of them grow to about 10 feet (3 meters) in length. But some South American boa constrictors have grown to more than 18 feet (5.5 meters). Most boa constrictors have brown and gray bodies with brown, black, and white markings. Some boa constrictors have silver or red bodies.

During the day the boa constrictor rests in tree hollows, old logs, and animal homes called burrows. At night it hunts a wide variety of birds, reptiles, and mammals. It hunts most animals on the ground. But it moves up into trees to hunt birds and bats.

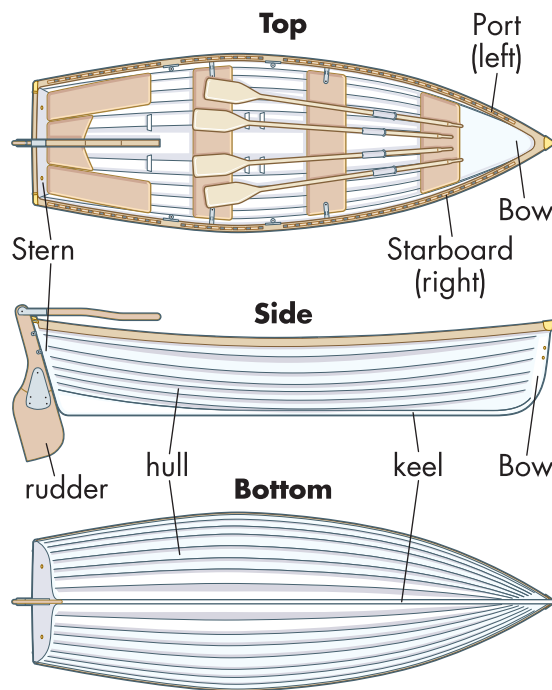
Most types of snake hatch from eggs laid by the female. However, the eggs of boa constrictors develop inside the female's body. The female gives birth to live babies, often 25 or more at a time. The baby snakes measure from 1 to 2 feet (0.3 to 0.6 meter) long.

► More to explore

Anaconda • Pet • Snake

Boat

For thousands of years people have used boats to move goods and people across water. Today the word boat means a small watercraft used for fun or for carrying small loads. Larger boats that carry many people or tons of goods over long distances are called ships.



There are many different kinds of boats, but most have the same basic parts.

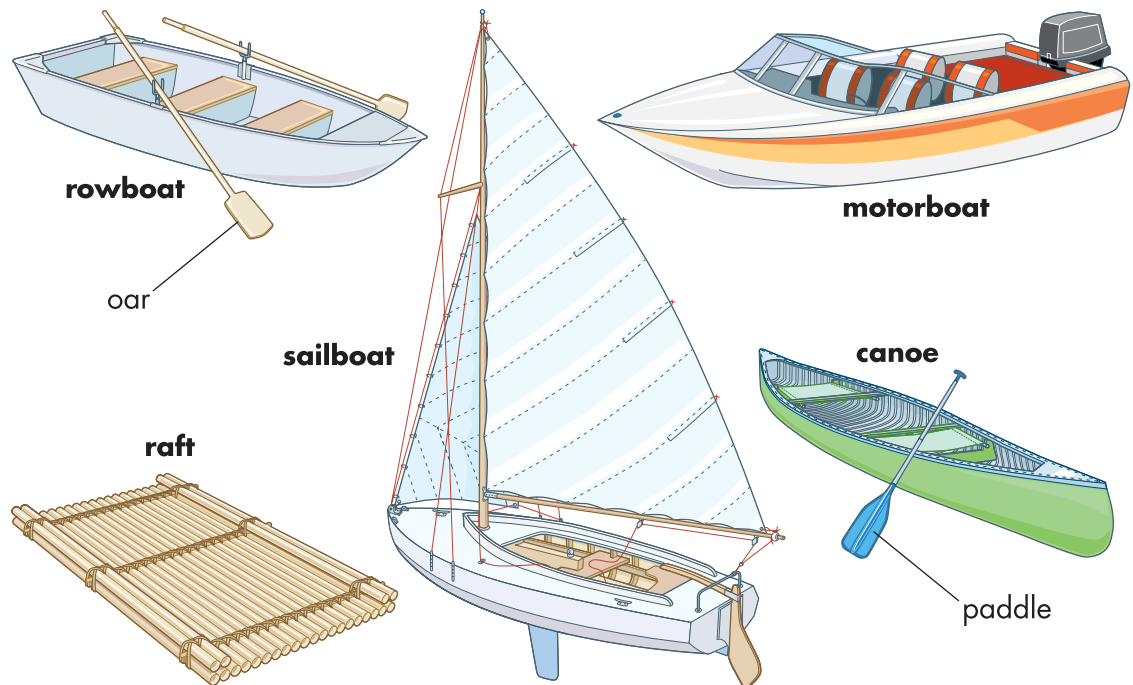
Parts of a Boat

Most boats have several common parts. The hull is the body, or frame, of the boat. The walls of the boat are called bulkheads. The deck is the floor of the boat. Underneath the boat are the keel and the rudder. The keel runs from the front to the back of the boat. It sticks into the water to keep the boat from tipping over sideways. The rudder is attached to the back of the boat. It helps to steer the boat.

The sections of boats also have special names. The front of the boat is called the bow. The back is called the stern. The left side of the boat is called port. The right side is called starboard.

Types of Boats

Boats come in many different sizes and types. In general they can be grouped



Five common types of boat are the rowboat, the sailboat, the motorboat, the raft, and the canoe.

into three main categories. These are based on the type of power needed to move them through the water.

Many boats need the effort of human muscles to move them. These include canoes and kayaks, which are small, lightweight boats with pointed ends. People use paddles to move canoes and kayaks forward. Rowboats are wider and heavier than canoes. People move rowboats forward with oars.

Sailboats are boats with sails, or large pieces of cloth, raised on posts called masts. Sails catch the wind, which pushes the sailboat along. Sailboats range in size from small, one-person boats to huge sailing ships that can cross oceans.

A motorboat is any boat that is powered by a motor. Engines can be

inboard or outboard. An inboard engine is permanently mounted inside the boat's hull. An outboard engine is clamped to the outside of the hull and can be removed easily. Both types usually move the boat by turning a propeller in the water.

Uses

Boats can be used for pleasure, for sport, or for work. Many people enjoy taking a canoe or kayak out on a river or a sailboat out on a lake for fun. Others like to race boats. Very narrow rowboats called shells or sculls are used in the sport of racing. Several categories of rowing are events in the Olympic Games. Sailboats and motorboats are also used for racing. The most famous international sailing competition is the America's Cup race. Boats used for work include fishing boats and tugboats.

History

Ancient peoples used boats as many as 10,000 years ago. Some of the earliest boats were simple rafts made out of bunches of reeds or logs tied together. Ancient peoples around the world made dugouts, or canoes carved out of logs. Native American and Inuit peoples made canoes out of bark or animal hides. People later built boats out of wooden planks. They added masts and sails, and later engines, for speed. Modern boats are often made of metal, fiberglass, or plastic.

► More to explore

Ship

Bog

A bog is a kind of wetland with wet, spongy soil. Bogs differ from marshes and swamps because their soil contains almost no minerals. That is because their main source of water is rainwater, which contains few minerals. In contrast, marshes and swamps have mineral-rich soil.

Bogs generally form in places where glaciers once dug into the Earth's surface. The glaciers left holes that filled with water and eventually formed bogs. A bog begins to form as a lake is covered with a floating layer of plants. As the layer thickens, pieces of the plants sink to the bottom. The plants eventually fill the lake and create a bog.

Plant life is limited in a bog because of the lack of minerals in the soil. Mosses and heaths are the main plants. Layers of



The Irish countryside features large areas of peat bogs.

dead plants build up in bogs to form a material called peat. Dried peat is burned for fuel. Animals are not common in bogs.

► More to explore

Glacier • Marsh • Swamp • Wetland

Bogotá



Population
(2005 estimate)
6,763,325

Bogotá is the capital of the South American country of Colombia. It is one of the largest cities in the northern part of South America. Bogotá is also a center of education, culture, and business.

Service industries such as banking, education, and health care are important to the economy. Manufacturing also brings



Street performers entertain a crowd in Bogotá.

money to the city. Bogotá's major products include tires, chemicals, and medicines.

At the center of Bogotá is the Plaza Bolívar, where the city government buildings and Roman Catholic cathedral are located. The city also has several major museums, libraries, and theaters. The Gold Museum has thousands of gold objects made by native peoples before Europeans arrived in the Americas.

Hundreds of years ago the Chibcha Indians lived in the area. The Spanish captured the Chibcha's main city in 1538. They named it Bogotá and made it the capital of a huge area they controlled in northwestern South America. The city was under Spanish rule until 1819. Bogotá remained a center of government in the area. It later became the capital of Colombia.

► **More to explore**
Colombia

Boise



Population
(2000 census),
city, 185,787;
(2007 estimate)
202,832

Boise is the capital of the U.S. state of Idaho. The city lies on the Boise River. It is the state's largest city.

Boise is also a center of business and banking. Local companies make computer parts, processed foods, and wood and metal products. Many people in Boise work for government offices or in construction.

Gold was discovered near the site of Boise in 1862. Fort Boise was soon founded in the area. A community sprang up to provide services to the gold



Mountains rise up to the north of Boise. They protect the city from blizzards that form in Canada in the winter.

miners. It grew into the city of Boise. Today tourists visit the empty old mines and mining towns, called ghost towns, near Boise.

In 1864 Boise became the capital of the Idaho Territory. It remained the capital when Idaho became a U.S. state in 1890.

Bolívar, Simón

Known as the Liberator, Simón Bolívar led revolutions against Spanish rule in South America. The countries of Venezuela, Colombia, Ecuador, Panama, Peru, and Bolivia all owe their independence largely to him.

Bolívar was born on July 24, 1783, in Caracas, New Granada (now in Venezuela). After studying in Europe, he returned to South America and began to fight Spanish rule. Between 1810 and 1814 Venezuela made two failed tries to



Simón Bolívar

break free from Spain. After the second defeat, Bolívar fled to Jamaica and then Haiti.

In 1819 Bolívar made a daring attack on the Spanish in New Granada. That colony included the territory of modern Venezuela, Colombia, Ecuador, and Panama. In August 1819 Bolívar's men defeated a much larger Spanish army. Then he announced that New Granada had become a new republic called Gran Colombia. He was its president. By 1822 all of Gran Colombia was free from Spain.

Bolívar next went to Peru. There he continued the work of José de San Martín. Martín had earlier begun a fight for independence. In 1824 his forces defeated the Spanish there. In the next year one of Bolívar's officers freed Upper Peru, the last part of South America under Spanish rule. To honor Bolívar, its name was changed to Bolivia.

At the height of his power, between 1825 and 1828, Bolívar ruled Gran Colombia, Peru, and Bolivia. He wanted the new countries to be allies, but they started fighting among themselves. Venezuela broke away from Gran Colombia in 1829, and Ecuador left in 1830. Deeply disappointed, Bolívar resigned as president. He died near Santa Marta, Colombia, on December 17, 1830.

► More to explore

Bolivia • Colombia • Ecuador • Panama
• Peru • Venezuela

Did You Know?

Venezuela named its unit of money the bolívar to honor Simón Bolívar.



Bolivia

A country in South America, Bolivia has breathtaking scenery, including deserts, jungles, and snow-covered peaks. Bolivia's culture blends American Indian and Spanish influences. Its judicial, or legal, capital is Sucre. However, the president and the legislature are based in La Paz.

Geography

Bolivia is bordered by Brazil, Paraguay, Argentina, Chile, and Peru. In the west the Andes Mountains stretch from north to south in two parallel ranges. The cool, dry Altiplano (High Plateau) lies between the two ranges. Tropical lowlands cover the east. Amazon rain forest covers the far north. The Bolivian Chaco region in the south is swampy in the rainy season but hot and desertlike for the rest of the year.

Plants and Animals

Coarse grass is common in the northern Altiplano, but much of that region is bare. Heavy forests of pines, laurels, and



Aymara Indian women take part in a festival in La Paz.

cedars cover the mountain slopes. Grasses, shrubs, and small trees that do not need a lot of water grow in the south. Mahogany and rubber trees grow in the northern rain forests.

The wildlife in Bolivia includes members of the camel family—llamas, alpacas, guanacos, and vicuñas. The Andean condor roosts in the mountains. In the northern forests are jaguars, sloths, monkeys, and tapirs. Parrots and toucans also live in the rain forests.

People

About 65 percent of Bolivians are American Indians, including the Aymara and the Quechua peoples. The Quechua are descendants of the Inca. About 30 percent of the population is mestizo, a mixture of Indian and European. The rest of the people are white, mainly descendants of Spanish conquerors. Aymara, Quechua, and Spanish are





Llamas stand on the shore of a lake in southwestern Bolivia.

Bolivia's official languages. Roman Catholicism is the main religion. More than half of the people live in cities.

Economy

Bolivia is one of the poorest countries in South America. However, it has large amounts of natural gas and is a major producer of zinc and tin. Most of the people work in agriculture, manufacturing, and trade. Many farmers raise sugarcane, soybeans, sheep, and cattle.

History

People have lived in what is now Bolivia for thousands of years. An advanced people lived in the area around Lake Titicaca (in western Bolivia) about 1,000 years ago. The region was later part of the powerful Inca Empire.

The Spanish conquered the area in the early 1500s. They ruled Bolivia as part of a larger region that included what is now Peru. Silver mines brought great

wealth to the region. By the end of the 1700s, however, there was little silver left. The Bolivians won their independence from Spain in 1825. They named the new republic after Simón Bolívar, who helped free the region from Spain.

After gaining independence, Bolivia fought several battles with neighboring countries. In the War of the Pacific, from 1879 to 1883, Bolivia lost territory along the Pacific Ocean to Chile. In the Chaco War, from 1932 to 1935, Bolivia lost most of the Chaco region to Paraguay. Bolivia also had trouble forming a stable government. The military ruled several times during the 1900s. But in 2005 the country elected its first Indian president. He promised to give the Indians of Bolivia a greater voice in the country's affairs.

► More to explore

Andes • Bolívar, Simón • Inca • La Paz • Sucre

Facts About BOLIVIA



Population
(2008 estimate)
9,694,000

Area
424,164 sq mi
(1,098,581 sq km)

Capitals
La Paz (administrative) and Sucre (judicial)

Form of government
Republic

Major cities
Santa Cruz, La Paz, El Alto, Cochabamba

Bomb

Bombs are weapons that people use to kill others and to damage property. Bombs are designed to explode. They may be dropped from aircraft, delivered by rockets, thrown by hand, or placed next to a target and blown up later.

Parts of a Bomb

A bomb is basically a container filled with explosive material. This material is usually a mixture of chemicals. A part called a fuse ignites (sets on fire) the explosive material. There are several types of fuses. Some fuses cause the bomb to blow up when it hits something. Other fuses cause the bomb to explode after a certain amount of time.

Bombs that fly through the air have fins or wings to keep them steady. Some bombs, called smart bombs, have a system that allows people to guide them in flight from far away.



A U.S. Air Force plane drops bombs during an attack on Afghanistan in 2001.

Types of Bombs

Armies and other military forces use several types of bombs. Demolition bombs destroy buildings with a powerful blast. Fragmentation bombs explode into small, fast-moving metal fragments that are meant to kill people. General-purpose bombs combine demolition and fragmentation. Armor-piercing bombs are heavy and pointed. Armies use them against protected targets. Incendiary bombs cause intensely hot fires. Cluster bombs contain many small bombs, or bomblets.

Criminals and terrorists sometimes make and use their own bombs. These bombs may be simpler than the bombs used by armies, but they can be very destructive. They include car bombs, pipe bombs, and letter bombs.

Nuclear bombs are the most powerful bombs of all. There are two types of nuclear bombs: atom and thermonuclear (or hydrogen). They both get their tremendous force from reactions that take place in the nuclei, or centers, of atoms. (Atoms are the tiny building blocks of everything.) The energy released by a nuclear bomb destroys nearly everything for miles around.

History

Grenades were the earliest bombs. These are small devices that are thrown by hand. Soldiers first began using grenades in about the 1400s. Eventually other, more accurate weapons were developed. But grenades are still used today.

After airplanes were invented in the early 1900s armies started using them to drop bombs. During World War I (1914–18) bomber planes could not carry many bombs at one time. By World War II (1939–45), however, that changed. Airplanes were able to carry larger bombs in much greater numbers.

The first nuclear bombs were developed during World War II. The war ended shortly after the United States dropped atom bombs on two Japanese cities, Hiroshima and Nagasaki, in August 1945. The bombs caused immense devastation. They killed more than 100,000 people. The United States tested the first hydrogen bomb in November 1952. It was even more powerful than the atom bomb. Several other countries later developed nuclear bombs of their own.

In the 1980s and 1990s many people were afraid that other countries would use nuclear weapons. Leaders of the countries that had such weapons began to talk about ways to control the weapons. They agreed to limit the production, testing, and use of nuclear weapons. In 1996 representatives from approximately 60 countries signed an agreement to stop all testing. The agreement was called the United Nations Comprehensive Test-Ban Treaty.

In wars today armies still use traditional types of bombs. However, new inventions have made it easier to deliver them



A huge cloud forms after a test of an atom bomb. The bomb causes so much damage that it has been used only twice.

with greater accuracy. Armies therefore do not use as many bombs as they once did.

► **More to explore**

Army • Nuclear Energy • Rocket

Bombay

► see Mumbai.

Bonaparte, Napoleon

► see Napoleon.

Bone

Humans and many other animals have a skeletal system made up of hard pieces called bones. Bones help to support the body and to protect its organs. Bones store important nutrients and minerals, too. Bones also make blood cells. The human body has more than 200 bones.

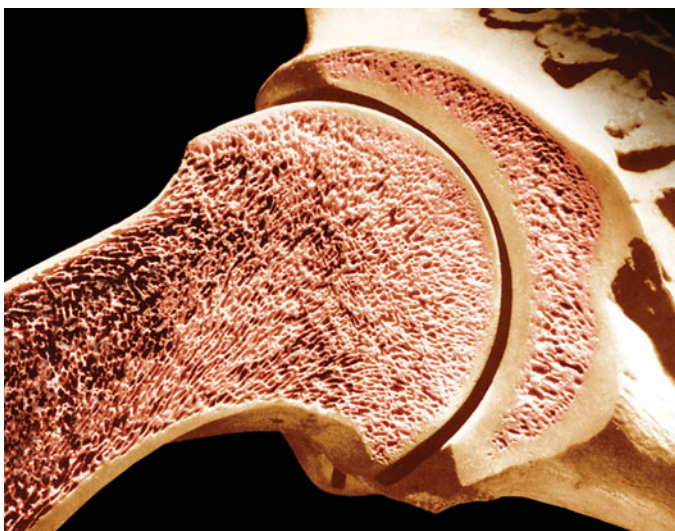
Bone Structure

There are two basic types of bone: compact bone and spongy bone. Both types are made of calcium and other minerals, fibers of protein, and water.

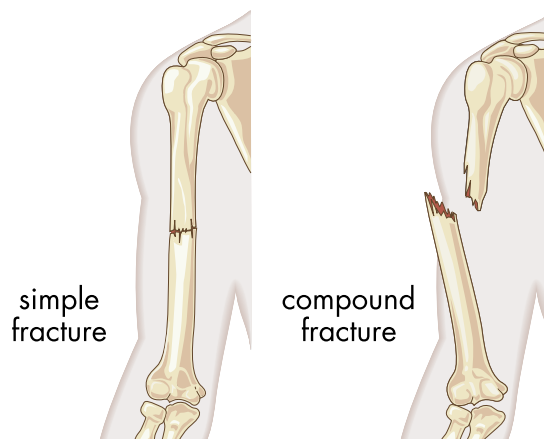
Compact bone is solid and very hard. It makes up the outer layer of all bones. It also makes up the shaft, or long tube, of arm and leg bones.

Spongy bone lies beneath most compact bone. It looks like a honeycomb or a sponge, but it is not soft. The many spaces within spongy bone let it absorb shock, or sudden pressure on the bone.

Bone marrow fills the hollow spaces in spongy bone. It also fills the hollow tubes of long bones. Marrow is a soft, jellylike substance that can be red or yellow. Red marrow makes blood cells. Yellow marrow stores fats.



An inside view of an arm bone shows that it is made of two different types of bone. The outside edges are compact bone, and the inside part is spongy bone.



A broken bone is considered a simple fracture if it stays beneath the skin. It is a compound fracture if it breaks through the skin.

A thin membrane, or skin, covers each bone. The membrane contains nerves and blood vessels that are attached to the bone. The blood vessels carry nutrients to the bone. They also carry blood cells from the bone to the rest of the body.

How Bone Is Made

Special cells start making new bone by building a structure of protein. Blood then brings in calcium, which sticks to the structure. When the calcium hardens, the new bone is complete. The body can also rebuild bone that wears away or breaks.

Broken Bones

When bones break, the injury is called a fracture. Most fractures are simple, which means they are beneath the skin. If the bone pokes out of the skin, it is called a compound fracture. How quickly the bone heals depends on the patient's age. As people get older it takes longer for broken bones to heal.

► More to explore

Blood • Mineral • Skeletal System

Bonn



Population
(2006 estimate)
312,818

Bonn is a city in Germany, a country of central Europe. Germany was divided into two countries from 1949 to 1990. During that period Bonn was the capital of West Germany. The city is famous as the birthplace of the composer Ludwig van Beethoven. It also has many beautiful parks. Bonn lies along the Rhine River.

Many people in Bonn work in government offices or for the University of Bonn. The city is also a transportation center. Bonn has few factories.



A statue in Bonn honors Ludwig van Beethoven. The composer was born in the city.

Bonn began as a village more than 2,000 years ago. The Romans later settled the site. They lost control of the area in about the 400s. Bonn survived as an independent village for many years. Later it was the capital of local rulers. In the 1800s it became a city in Germany.

The city was damaged by bombs during World War II (1939–45). After the war Bonn became the capital of West Germany. West and East Germany were combined in 1990. Berlin then became Germany's capital. But some government offices remained in Bonn.

► More to explore

Germany

Bonobo

The bonobo, along with the chimpanzee, is the closest living relative to humans. It is an ape related to the gorilla and the orangutan, as well as the chimpanzee. All these animals are called great apes because they are large and very intelligent. Bonobos and other great apes belong to the larger group of mammals called the primates. The primates also include other apes, humans, and monkeys.

Bonobos can be found in only one area of the world. They live in rain forests in the Democratic Republic of the Congo, a country in Africa. They are highly endangered, or at risk of dying out completely. Humans have hunted them and destroyed much of their habitat.

Did You Know?

Scientists once thought that bonobos were a type of chimpanzee. In 1933 they decided the two were separate species.



Bonobos live in rain forests. They often feed and even sleep in the trees.

Bonobos look very similar to chimpanzees. They have black hair. Adult male bonobos are larger than the females. Adult males may be almost 4 feet (1.2 meters) tall. They may weigh as much as 134 pounds (61 kilograms). Bonobos do not have a tail, but they have a tuft of white fur where a tail would be.

Bonobos eat mostly fruits. Sometimes they eat leaves and seeds. In rare cases bonobos will also eat small animals, such as bats. They spend the day feeding in trees, resting, and traveling on the ground to other trees. They also can swing from tree branch to tree branch with their arms. Bonobos build leafy beds in trees to sleep in at night.

► More to explore

Ape • Chimpanzee • Endangered Species
• Primate

Book and Bookmaking

A book is a printed work that is meant to communicate. To communicate is to share ideas or information. A book is made up of pages that are usually enclosed in a protective cover. People have written books about all kinds of subjects. Among the countless types of books are novels, picture books, cookbooks, how-to books, poetry books, and textbooks.

From Manuscript to Pages

The first step in creating a book is for an author to write a manuscript. A manuscript is a book before it has been published. The author finds a publisher, or a company that makes and sells books. Editors at the publishing company help the author improve the manuscript. They make sure that the ideas are complete, that the writing is clear, and that there are no errors.

Then the manuscript goes to a designer. This person arranges the text and pic-



A bookshop in Italy displays many different books in its windows.

tures on the pages so that the book looks nice and is easy to read. A designer also creates the cover.

Editors and designers continue working on the pages until they are perfect. Most of this work is done on computers. The designed book is stored in computer files.

Printing Books

Next, the computer files are used to create printing plates. Printing plates are sheets of metal or plastic that have the book's text and pictures on them. Printing plates are put on printing presses and used to print the book.

Most book pages are printed on long rolls of paper. After printing, the paper is folded, cut, and arranged into bundles of pages called signatures. The signatures are sewn and glued together along the folded edges. Finally, the book cover is glued to the signatures. Books can have either a hard cover or a soft cover.



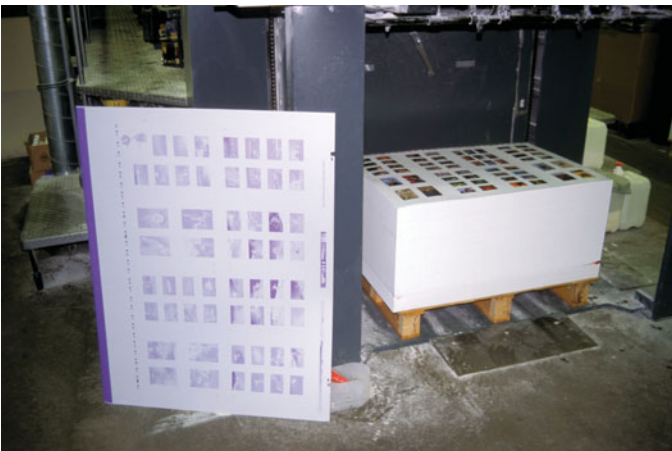
A man works on restoring one of the oldest copies of the Koran, the holy book of Islam. Many old books need repairing as they have started to fall apart over the years.

History

The earliest forms of bookmaking date back to about 3000 BC. The first ancestors of books were Egyptian papyrus rolls. The rolls consisted of a long strip of paper made from a type of water grass called papyrus. Other ancient forms were made of clay tablets, sheets of animal skin, or bundles of bamboo. The Chinese invented paper around AD 100. In Europe people continued to use animal skins, called vellum or parchment long after that. The first papermaking equipment reached Europe in the 1300s.

Early books were difficult to produce. The text was written by hand. Many books made in Europe and in the Islamic world had elaborate drawings. As a result, books were expensive and hard for most people to get. Only wealthy, powerful people and certain scholars and religious leaders read these early books.

The invention of printing changed that. In about 1450 a German craftsman



Offset printing is one method of printing. Text and images appear on a printing plate (left), which is used to print the book pages. The stack of printed sheets (right) are ready to be cut and folded into signatures.



An illustration in an old manuscript shows how books were made long ago. The few people who knew how to read and write copied the text by hand.

named Johannes Gutenberg invented a special type of printing press.

Gutenberg's press used metal type, or letter shapes made from metal.

Gutenberg arranged the metal type in trays to spell out words and sentences. Then he spread ink onto the metal type and pressed the trays against sheets of paper. The trays could be used again and again.

Gutenberg's type and press could print many books quickly. By the 1500s thousands of printing shops were producing millions of copies of books. Books became available to ordinary people for the first time.

Today books are published in every language. Personal computers have allowed people to publish their own books. Many books can be read or downloaded from the Internet. This has made books easier to get than ever before.

► More to explore

Gutenberg, Johannes • Paper • Printing

Boomerang

A boomerang is a curved throwing stick. People use boomerangs as toys or as weapons. The Aborigines, the native people of Australia, have long used boomerangs for hunting and warfare.

There are two types of boomerangs: returning boomerangs and nonreturning boomerangs. Returning boomerangs are lightweight and have a special curved shape. A returning boomerang flies in a circle and comes back to the thrower.



A guide in Australia shows how to throw a boomerang.

People use returning boomerangs for sporting events and as toys.

Nonreturning boomerangs are not toys. Ancient peoples used them for killing prey or enemies. This type of boomerang is much straighter than a returning boomerang. It cuts through the air in a wobbly way.

True boomerangs are found mainly in Australia. However, people in ancient Egypt, southern India, and other cultures also used boomerang-shaped weapons. Some Native American groups used boomerang-shaped weapons for hunting.

The first boomerangs were made from a single piece of carved wood. The carver heated the wood in hot ashes and then bent it to get the right shape. Today boomerangs used for sports are often made of plywood or fiberglass. Their shape can be very different from the curved shape of traditional boomerangs.

► More to explore

Aboriginal Peoples

Boone, Daniel

The American frontiersman Daniel Boone blazed a trail through the Cumberland Gap, a pass in the Appalachian Mountains. His trail opened the West to settlement and made him a hero.

Daniel Boone was born in Pennsylvania on November 2, 1734. He had little schooling, but he learned to read and write. He also learned blacksmithing, weaving, hunting, and trapping. When



A detail of a painting from 1851 shows Daniel Boone escorting settlers through the Cumberland Gap.

he was about 16, he moved with his family to the North Carolina frontier. He hunted and trapped in the wilderness.

Boone first passed through the Cumberland Gap into Kentucky in 1767. In 1773 Boone tried to settle in Kentucky with his family, but an Indian attack forced them to turn back. Two years later a company hoping to make Kentucky a new colony hired Boone to open a trail through the gap. The trail Boone cut was called the Wilderness Road. Boone built a new settlement, Boonesborough (now Boonesboro), at the end of the trail.

Boone became famous as a frontiersman, but he was still poor. He owned none of the land he helped open to settlement. He moved around with his family, working various jobs. He continued to hunt and trap. Boone died in Missouri on September 26, 1820.

► More to explore

Appalachian Mountains • Cumberland Gap



Bosnia and Herzegovina

For most of the 20th century Bosnia and Herzegovina was a part of the country of Yugoslavia. A civil war in the 1990s ended with Bosnia and Herzegovina's independence. The capital is Sarajevo.

Geography

Bosnia and Herzegovina is located on the Balkan Peninsula in central Europe. It is bordered by Croatia, Montenegro, Serbia, and the Adriatic Sea. Bosnia is the larger of the two regions. It occupies the northern and central parts of the republic.

Bosnia and Herzegovina is a mountainous country. It has many rivers, including the Bosna, from which the country takes its name.

Plants and Animals

Pine, beech, and oak forests cover about half of Bosnia and Herzegovina. The country's varied wildlife includes bears,

wolves, wild pigs, wildcats, chamois (goatlike animals), otters, foxes, badgers, and falcons.

People

The major ethnic groups are Bosniacs (Muslims), Serbs, and Croats. Bosniacs constitute more than two fifths of the population, Serbs less than one third, and Croats less than one fifth. All three peoples speak the same language, Serbo-Croatian.

The Serbs are mostly Orthodox Christians, while the Croats are mainly Roman Catholic. The Bosniacs are descended from Slavs who converted to Islam under the rule of the Ottoman Empire.

Economy

Almost half of the people work in manufacturing and mining. Manufacturers produce cement, steel, and pig iron. Mines provide coal, iron ore, and other metals. Trade and services are other key parts of the economy.

Agriculture and logging are also important. Crops include corn, potatoes, wheat, cabbages, oats, plums, and tobacco.

History

Slavic peoples settled in what is now Bosnia and Herzegovina in the 500s and 600s. Between brief periods of indepen-





Fireworks light up the sky at a celebration in Mostar. The city's bridge was destroyed during the civil war that broke out in the 1990s. But it was rebuilt and reopened in 2004.

dence, a series of other groups controlled the region.

The Ottoman Empire conquered Bosnia in the 1400s. Much of the native population, mainly landowners, converted to Islam. In the 1700 and 1800s, tensions grew between the Muslim landowners and the Christian peasants, who were Serbs and Croats.

The Austro-Hungarian Empire officially claimed the area in 1908. Bosnian Serbs soon began protesting against Austro-Hungarian rule. In 1914 a Bosnian Serb killed Austrian archduke Francis Ferdinand. The assassination triggered World War I. After the war Bosnia and Herzegovina became part of a new Serbian-controlled kingdom named Yugoslavia.

After World War II Yugoslavia became a Communist state. When the Communist government fell in 1989, the tensions between Serbs, Croats, and Muslims reemerged. Bosnian Croats and Muslims wanted an independent republic. Bosnian Serbs, however, refused to separate from Yugoslavia.

Shortly after Bosnians voted for independence in early 1992, a civil war broke out between Serbs, Croats, and Muslims. The fighting left more than 2 million people homeless and killed more than 200,000. The warring parties finally agreed to peace in 1995. Bosnia and Herzegovina had gained its independence.

► More to explore

Austria-Hungary • Montenegro
• Ottoman Empire • Sarajevo • Serbia

Facts About BOSNIA AND HERZEGOVINA



Population
(2008 estimate)
3,858,000

Area
19,772 sq mi
(51,209 sq km)

Capital
Sarajevo

Form of government
Federal republic

Major cities
Sarajevo, Banja
Luka, Zenica,
Tuzla, Mostar

Boston



Population
(2007
estimate), city,
599,351;
(2008
estimate),
metropolitan
area,
4,522,858

Boston is the capital of the U.S. state of Massachusetts. The city lies on a harbor where the Charles River flows into the Atlantic Ocean. It is one of the oldest cities in the United States. Boston is a leading center of education, culture, medicine, and business in the New England region.

Insurance, finance, and computer industries are central to Boston's economy. Many important hospitals and universities are located in the city. In nearby Cambridge is Harvard University. It is the oldest university in the United States. Other important industries in Boston include food processing, publishing, and electronics manufacturing.



Quincy Market is a shopping and gathering place in Boston.



The USS *Constitution*, which is nicknamed Old Ironsides, was launched from Boston in 1797. It is now part of the Boston National Historical Park.

Boston was one of the first cities that Europeans settled in what is now the United States. English settlers founded the town in 1630. It soon became the capital of the Massachusetts Bay Colony. Boston's fine natural harbor made it an important city. It grew as a center of shipping as well as of culture and education.

Two important events happened in Boston in the years leading up to the American Revolution. In the Boston Massacre of 1770 British troops shot at an angry crowd. In the Boston Tea Party of 1773 colonists dumped shiploads of British tea into the harbor. They did this to protest British taxes on tea. During the war American troops gained control of the city from the British.

In the 1800s the people of Boston took a leading role in the movement to end slavery in the United States. For a time the city was an important manufactur-

ing center. In the late 20th and early 21st centuries the city's high-technology and service industries grew.

► More to explore

American Revolution • Massachusetts Bay Colony

Botany

Botany is the study of plants. It is a branch of biology. Scientists who work in the field of botany are called botanists.

Botany is important because people and animals depend on plants in many ways. People and animals get food and oxygen from plants. People also use plants to make clothing, building materials, drugs, and countless other things.

Botanists usually focus on a specific area. Some discover new kinds of plants,



Botanists make field trips to study plants in their natural environment.



Children learn how to care for potato plants at a botanical garden. Such gardens are designed to teach the public about the plants that are on display.

name them, and classify them (group them with similar plants). Other botanists study the structure and form of plants.

Many botanists work as researchers. Some researchers study plant diseases. Others experiment with plant chemicals. Others try to develop plants that are more useful to humans.

Many botanists are interested in conservation. Some investigate the effects of pollution on plants. Others work to protect rare plants.

Theophrastus, a Greek thinker who lived in the 300s BC, is considered the founder of botany. In the 1700s a Swedish botanist named Carolus Linnaeus created a system for naming and classifying plants. Scientists around the world still use this system today.

► More to explore

Biology • Plant



Botswana

Since gaining independence in 1966, the African country of Botswana has enjoyed a stable government, economic growth, and harmony between its peoples. The country's unspoiled wilderness draws many visitors. The capital is Gaborone.

Geography

Botswana is bordered by Zimbabwe, South Africa, Namibia, and Zambia. Rivers, including the Chobe, the Limpopo, and the Molopo, form several of the borders. The country is almost entirely flat, with hills only in the southeast and northwest. The Kalahari Desert covers most of the south and west. The Okavango Swamp lies in the northwest. Much of the country has hot summers and cooler winters.

Plants and Animals

Savannas, or grasslands with scattered trees, cover much of Botswana. The



Lions rest in Botswana's Chobe National Park.

Kalahari has desert grasses and scrub. True forests occur only in the far north.

Botswana's wildlife includes lions, elephants, leopards, giraffes, buffalo, antelopes, zebras, wildebeests, ostriches, snakes, and scorpions. Hippopotamuses, crocodiles, and hundreds of types of birds live near the rivers.

People

Botswana's largest ethnic group is the Tswana, followed by the Kalanga. Scattered groups of San live in the Kalahari. About half of the people live in cities and towns, mainly in the southeast. The official language is English, but most people speak Setswana in daily life. About 40 percent of the people follow traditional African religions. The rest of the people are mostly Christians.

Economy

Botswana's economy is based largely on mining. The country has rich deposits of





The Okavango River delta in northern Botswana is a vast swampland.

diamonds, soda ash (sodium carbonate), copper, nickel, and coal. Diamonds are Botswana's most valuable export. Manufacturers make cars, beverages, and bricks. Tourism is a major source of income.

Livestock raising and farming, the traditional occupations of the Tswana, still employ most of the workers. Farmers raise goats, cattle, and sheep. They grow sorghum, legumes, and corn.

History

Botswana's earliest inhabitants were probably Khoekhoe and San peoples. Archaeologists believe that these people first arrived in the region in about 17,000 BC. Bantu-speaking farmers began migrating to the area in about AD 190. In the 1700s the Tswana people arrived and established several powerful states. They soon came to dominate the country that is now named after them.

In 1867 the discovery of gold excited European interest in the area. In 1885 the region came under the control of the British, who called it the Bechuanaland Protectorate.

In 1966 Bechuanaland gained independence as the Republic of Botswana. The country's first president, Seretse Khama, promoted democracy and built up the economy. Problems between Botswana, Rhodesia (now Zimbabwe), and South Africa eased in the 1980s and 1990s.

Stability in southern Africa allowed Botswana to focus on solving its own problems. In the early 21st century those problems included a large gap between the rich and the poor, unemployment, and a high rate of HIV infection and AIDS.

► More to explore

Africa • Gaborone • Kalahari

Facts About BOTSWANA



Population
(2008 estimate)
1,842,000

Area
224,848 sq mi
(582,356 sq km)

Capital
Gaborone

Form of government
Republic

Major cities
Gaborone, Francistown, Molepolole, Selebi-Pikwe, Maun

Boxing

Boxing is a sport in which two people fight with their fists. A boxing competition is called a match, a fight, or a bout. A boxer can win by knocking out the other boxer. A boxer can also win by scoring more points than his opponent.

A Boxing Ring and Equipment

A boxing match takes place on a square platform called a ring. The ring is surrounded by ropes. The ropes keep the fighters from falling out of the ring. Each fighter uses a corner of the ring as a base. During pauses in the fight, the boxers go to their corners.

A boxer wears padded gloves on each hand. To protect the teeth, a boxer wears a mouth guard. Amateur boxers wear padded headgear.

Weight Classes

Professional boxers are grouped by weight into more than 12 different weight classes. The lightest group is the strawweight or mini-flyweight class.



Boxing is a sport that requires strength and stamina.

Fighters in this class weigh no more than 105 pounds (48 kilograms). The heavy-weight class has the heaviest fighters. Heavyweights usually weigh 190 pounds (86 kilograms) or more.

A Boxing Match

A boxing match is divided into three-minute periods called rounds. The boxers get one minute of rest between rounds. A professional boxing match is usually scheduled to last 12 rounds. An amateur match usually has three scheduled rounds. A person called the referee stands inside the ring with the boxers. The referee makes sure that the boxers follow the rules.

A boxer can win a match by knockout (KO) or technical knockout (TKO). A knockout happens after one boxer hits the other so hard that the second boxer falls down. The referee declares a knockout if the second boxer cannot stand up within 10 seconds. The referee declares a technical knockout when a weakened or injured boxer is no longer able to defend himself.

Sometimes neither boxer can win a match by knockout or technical knockout. Then the winner is decided by points. Three judges score the match on scorecards. The judges award points to the boxers for the number of punches that they land, or get through their opponent's defenses. Boxers also score points for defensive skill. To win the match by points, a boxer must have more points on at least two of the three scorecards.

History

Fist-fighting contests date back to ancient times and probably much earlier. In ancient Greece boxers wrapped their hands and forearms in leather for protection. In ancient Rome fighters called gladiators wore leather hand coverings that were studded with bits of metal or metal spikes.

Boxing again became a popular sport in England in the early 1700s. Boxers then fought without gloves. An English fighter named Jack Broughton put together the first set of boxing rules in 1743. In 1838 a new set of rules banned kicking, biting, head butting, and hitting below the waist. The rules were changed again in 1867. These rules required boxers to wear gloves.

During the 1900s most of boxing's heavyweight champions were from the United States. Jack Dempsey and Joe Louis were famous U.S. heavyweight champions in the first half of the 1900s. Later champions included Rocky Marciano, Muhammad Ali, and Joe Frazier. In the 21st century boxing became

increasingly popular with women. They now participate in both amateur and professional matches.

► More to explore

Ali, Muhammad • Gladiator

Boy Scouts

► see Scouting.

Brachiosaurus

Brachiosaurus was one of the tallest of all dinosaurs. The name *Brachiosaurus* means “arm lizard” in Latin. Scientists call it this because of its long front legs. *Brachiosaurus* belongs to the group of dinosaurs known as sauropods. The sauropods were plant-eating dinosaurs with long necks, massive bodies, and four pillarlike legs.

When and Where *Brachiosaurus* Lived

Brachiosaurus lived about 150 to 130 million years ago. Remains of *Brachiosaurus* have been found in Europe,



Brachiosaurus

Did You Know?

Brachiosaurus is the largest and heaviest land animal for which scientists have a complete set of fossil bones.

Africa, and North America. *Brachiosaurus* lived in areas with much plant life, especially tall trees.

Physical Features

Brachiosaurus could reach more than 75 feet (23 meters) in length and weighed up to 80 tons. It stood about 40 feet (12 meters) tall from its head to the ground. The most striking features of *Brachiosaurus* were its sloped back and long neck. Its front legs were longer than its back legs. It also had a relatively short tail. Its dome-shaped head was small, and its snout was somewhat flat. *Brachiosaurus* had a few dozen pencil-like teeth.

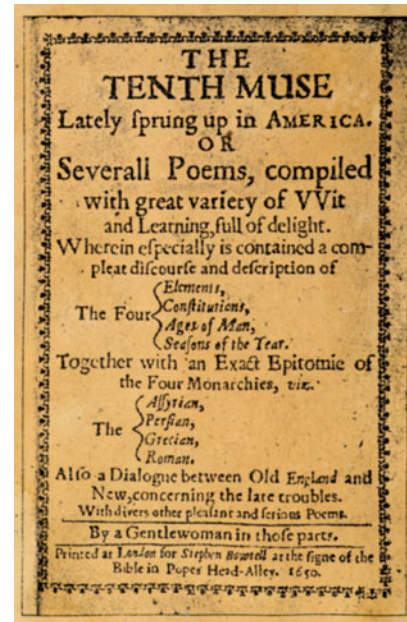
Behavior

Brachiosaurus lived and traveled in herds. Scientists believe that *Brachiosaurus* could travel at speeds of about 12 to 19 miles per hour (19 to 31 kilometers per hour). Its size and weight, as well as sharp claws on its feet, protected it from meat-eating dinosaurs. Its tremendous height also allowed *Brachiosaurus* to watch for enemies coming from miles away.

Bradstreet, Anne

One of the first poets in England's American colonies was Anne Bradstreet. Her poems reflect her religion, a strict form of Christianity called Puritanism.

Anne Bradstreet was born Anne Dudley in Northampton, England, in about 1612. At age 16 she married Simon Bradstreet, the son of a Puritan minister. In 1630 the young couple moved to



Anne Bradstreet's poems were published under the title *The Tenth Muse*.

America with Anne's parents and other Puritans who were setting up the Massachusetts Bay Colony.

Simon was often away from home, leaving Anne on her own with their children. During this time, she began writing about her family and religion. She showed her poetry only to her family. However, her sister's husband had her poems published in England in 1650 as a book called *The Tenth Muse*. It was the first book of poems written by an American.

The Bradstreets moved to Andover, Massachusetts. Anne Bradstreet died there of tuberculosis in 1672. Her works were praised by Puritans in her own time, and they came to be appreciated once more in the 20th century.

► More to explore

Massachusetts Bay Colony • Puritans

Braille

Braille is a system that allows blind people to read and write. It is named after its French inventor, Louis Braille.

Invention

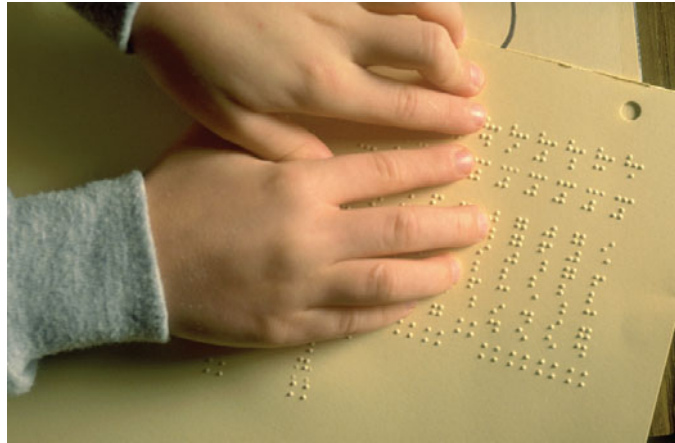
Louis Braille was born near Paris, France, on January 4, 1809. He became blind at the age of 3. At that time blind people read by touching letters engraved in wood, cut in cardboard, or cast in lead. It was a difficult and slow method. There was no method for writing. As a schoolboy Braille developed a system of reading and writing using six dots punched into cardboard.

Braille published his system in 1829. By that time he was teaching at the School for Blind Youth in Paris. The students there quickly accepted it, but the teachers did not. It was not until 1854, two years after Braille's death, that the school adopted the system. From there it slowly spread throughout the world.

The Braille System

Braille is a code of 63 dot patterns called characters. Each character represents a letter, combination of letters, common word, or grammar sign. They are read by touching them lightly. When preceded by a number sign (#), the first 10 letters of the alphabet are read as numbers.

Writing Braille by hand is accomplished with tools called a slate and stylus. The slate consists of two metal plates. A sheet of paper is inserted between the slate's



People read Braille by moving their fingers over a series of raised dots on a page.

two plates. The stylus is a pen-shaped device used to press the paper against pits in the lower plate to form raised dots. A person using Braille writes from right to left; when the sheet is turned over, the dots face upward and are read from left to right. Braille is also produced by special machines.

Brain

In animals, including humans, the brain is the control center for the body. As a part of the nervous system, the brain receives and makes sense of signals sent from nerve cells in the body. The brain also sends information to the body's muscles and organs.

The brains of humans and other vertebrates (animals with a backbone) are large masses of nerve cells protected by a skull. Vertebrates' brains are divided into several sections. Each section has its own functions. The brains of invertebrates (animals without a backbone) are much simpler.

The Human Brain

The human brain is a very powerful organ. It controls the working of all parts of the body. It also controls a person's thoughts and feelings. The brain helps the body to stay healthy and to respond in the right way to its environment.

The brain of an average adult weighs about 3 pounds (1.4 kilograms). It looks something like a mushroom. The “cap” of the mushroom is the cerebrum. It is the very top of the brain and its largest part. Its surface has many cracks and folds. The cerebrum is the “thinking” part of the brain.

The “stem” of the mushroom is the brain stem, which is attached to the spinal cord. The brain stem controls the things that happen automatically in the body. These include the heartbeat, breathing, pleasure, pain, and hunger.

At the back of the head, between the brain stem and the cerebrum, is the cerebellum. It controls balance, posture, and muscles. It also helps in speech.

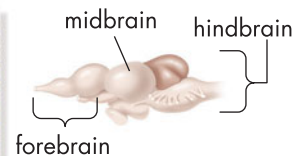
Brains of Other Animals

The brains of vertebrates other than humans are divided into three main sections: hindbrain, midbrain, and forebrain. In fish and amphibians, the midbrain is the main center of the brain. The midbrain is less important in mammals, birds, and reptiles. These animals have larger forebrains.

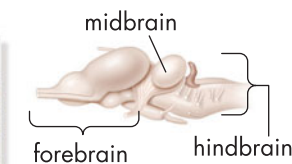
The brains of insects and other invertebrates are groups of nerve cells. They are located at the ends of nerve

Animal Brains

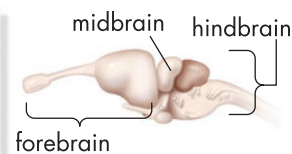
Fish



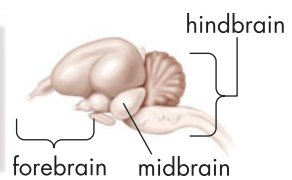
Amphibian



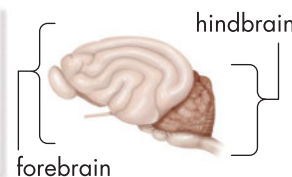
Reptile



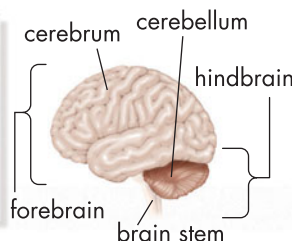
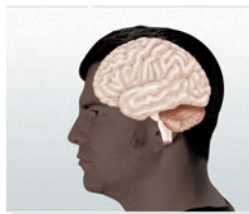
Bird



Mammal: Cat



Mammal: Human



Most animals have some sort of brain. They vary greatly in size and shape.

cords that run through the animal's body. This type of brain allows the animal to control its body and to sense its environment. Very simple animals have networks of nerves but no brain.

► More to explore

Nervous System

Did You Know?

The left side of the brain controls the right side of the body, and the right side of the brain controls the left side of the body.

Brasília



Population
(2007
estimate), city,
2,348,600;
urban area,
3,507,662

Brasília is the capital of the South American country of Brazil. The city lies on the Paraná River. It is famous for the design of its buildings and for the bird- or airplane-shaped layout of its streets.

Many large companies have offices in Brasília. The government of Brazil employs many people in the city. Many others work in banking, law, or other service industries.

Brasília was built in just a few years, starting in the late 1950s. Rio de Janeiro was the capital of Brazil until 1960. In that year the government offices began moving to Brasília. The new city grew rapidly.

► More to explore

Architecture • Brazil • Rio de Janeiro

Brass

Mixing the metals copper and zinc together makes brass. Such a mixture of metals is called an alloy. Brass is often used to make tools and machine parts. Sculptors and other artists use brass because it is easy to shape. Brass doorknobs, faucets, and towel racks are found in many homes. Brass is also used to make such musical instruments as trombones, trumpets, and French horns.

Working with Brass

It is possible to work with brass when it is hot or cold. Hot, melted brass can be poured into molds of many different shapes. As the brass cools, it hardens. Cold brass can be pounded, pressed, or engraved (scratched with a design).

History

People in western Asia made brass more than 2,000 years ago. People in ancient Greece and Rome used brass for jewelry, armor, and cups and bowls. From the 1200s to the 1600s people in Europe made large brass plates to decorate graves. They also used brass for church decorations, bowls, candlesticks,

Did You Know?

Brazil's leaders moved the capital to Brasília because they wanted people to move inland and develop the country's resources.



Brasília is known for its unusual architecture. These government buildings were designed by architect Oscar Niemeyer.



A store in Egypt displays many trays and other objects made of brass.

and locks. People later made clocks, sundials, and scientific instruments out of brass. Until steel became widespread in the middle of the 1800s, cannons often were made of brass.

► More to explore

Alloy • Metal • Steel

Bratislava



Population
(2006 estimate)
417,653

Bratislava is the capital of the Central European country of Slovakia. The city lies on the Danube River. It is Slovakia's largest city and center of culture and education.

Many people in Bratislava work for the government. Others work in business

offices, banks, and other places that provide services. Factories in the city make cloth, chemicals, and electrical goods. Bratislava is home to a number of schools, including Comenius University. The city also has many museums and theaters.

In ancient times the Celts and Romans built forts and villages in the Bratislava region. A group of Slavs known as the Slovaks arrived in the 500s or 600s. In the 900s the area became part of the kingdom of Hungary. Bratislava was the capital of Hungary for about 250 years in the 1500s to 1700s. Hungarian lawmakers met in Bratislava until the mid-1800s.

In 1918 Slovakia became a part of the new country of Czechoslovakia. Bratislava was capital of the province. In 1993 Slovakia became an independent country with Bratislava as its capital.

► More to explore

Slovakia



A castle stands on a hill above Bratislava. The castle burned down in 1811 but was later rebuilt.

Brazil

The largest country in South America, Brazil takes up about half of the continent. Brazil's Amazon River basin, including the Amazon rain forest, is one of Earth's richest areas of plant and animal life. The capital is Brasília.

Geography

Brazil shares borders with every South American nation except Ecuador and Chile. The Atlantic Ocean lies to the east. Brazil's two main geographical regions are the Amazon River basin in the north and the Brazilian Highlands in the center, east, and south. The northeastern coast is flat and dry. The southeastern coast includes narrow plains and mountains. In the west-central part of Brazil is a vast wetland called the Pantanal.

Brazil is the world's largest tropical country. It is hot year-round in much of

the country, but temperatures are cooler along the coast and in the south.

Plants and Animals

The Amazon rain forest has the most varied plant life on Earth. Animals living in the trees include tree frogs, salamanders, monkeys, and swarms of insects, including many butterflies. Parrots, macaws, and hummingbirds are common birds. Larger animals in the rain forest include jaguars, tapirs, pumas, and sloths. Along the riverbanks are found capybaras (the world's largest rodents), as well as alligators, boa constrictors, and turtles. The Amazon River itself contains electric eels, catfish, piranhas, manatees, and freshwater dolphins.

Grasslands cover most of the Brazilian Highlands. In the Pantanal wetland are great numbers of birds, reptiles, insects, and such larger animals as anteaters and armadillos. In the drier northeast the plant cover is low and spread out. Thicker woodlands of thorny trees grow in moister areas.

People

Brazil's population is a mix of several different ethnic groups. The country was a colony of Portugal for more than 300 years. Today, more than half of the people are white, descendants of the Portuguese colonists or other European immigrants. About 40 percent of the people have a mixture of white and American Indian or black roots. Smaller





The Pantanal is the world's largest wetland.

numbers of people have mainly African, Asian, or American Indian ancestors. Most Brazilians speak Portuguese. Roman Catholicism is the main religion, though many Indian and African beliefs are also practiced.

More than 80 percent of Brazil's people live in cities or towns, and 13 of those cities have more than 1 million inhabitants each. São Paulo and Rio de Janeiro are two of the world's largest cities.

Economy

Services—including education, government, banks, hospitals, restaurants, and the military—are the largest part of Brazil's economy. Manufacturing is the second most important area of the economy. The country mainly produces foods, petroleum products, cars and trucks, electrical equipment, steel, and chemicals. Brazil's industries use its reserves of iron, silicon, clay, quartz, gold, coal, petroleum, natural gas, and wood.

Farmers use less than 10 percent of Brazil's land, mostly in the south. However, Brazil is one of the world's top producers of oranges and coffee. Farmers also grow sugarcane, soybeans, corn, cassava, rice, bananas, tomatoes, and many other crops. They raise great numbers of cattle and hogs.

History

Before the Portuguese arrived in what is now Brazil, at least 2 million American



TIMELINE

Pedro Álvares Cabral claims Brazil for Portugal.

The Portuguese royal family moves to Brazil.

The emperor is overthrown; Brazil becomes a republic.

Brazil adopts a new, democratic constitution.

1500

mid-1500s

1808

1822

1889

1937

1988

Brazil begins importing millions of African slaves.

Brazil becomes an independent empire.

President Getúlio Vargas begins ruling as a dictator.

Indians lived there. Many were hunters and gatherers. Others lived in large villages and were expert farmers and fishermen.

In 1500 the navigator Pedro Álvares Cabral claimed the land for Portugal after landing near what is now Pôrto Seguro, Brazil. Portuguese settlers soon began bringing in Africans to work as slaves on plantations and, later, in mines. By 1822, when the slave trade ended, about 4 million Africans had been brought to Brazil.

When the French emperor Napoleon I threatened to invade Portugal in 1808, the Portuguese royal family fled to Brazil. They ruled from there and made Brazil equal with Portugal in the new United Kingdom of Portugal, Brazil, and the Algarves. The king returned to Portugal in 1821, but his son, Dom

Pedro, stayed in Brazil. The next year Dom Pedro declared Brazil's independence from Portugal and became emperor of the new nation. In 1889 the emperor Pedro II was forced to give up his power, and the monarchy came to an end. Brazil became a federal republic with an elected government.

Since its independence, Brazil has been one of Latin America's most stable nations, though dictators and the military have ruled at times. Since 1985 civilian (nonmilitary) presidents have led Brazil. In 1988 the country adopted a new constitution that guaranteed basic social and labor rights. Brazil continued to struggle to strengthen its economy, which has suffered from long periods of rising prices.

► More to explore

Amazon River • Brasília • Rio de Janeiro • São Paulo



Dancers perform at a parade during the annual festival known as Carnival in Rio de Janeiro, Brazil.

Facts About BRAZIL



Population
(2008 estimate)
187,163,000

Area
3,287,612 sq mi
(8,514,877 sq km)

Capital
Brasília

Form of government
Federal republic

Major cities
São Paulo, Rio de Janeiro, Salvador, Belo Horizonte, Fortaleza, Brasília

Brazzaville



Population
(2005 estimate)
1,174,000

Brazzaville is the capital of the Republic of the Congo, a country in west-central Africa. It is the country's largest city.

Brazzaville is an important port on the mighty Congo River. A railroad carries goods from Brazzaville's port to a port on the Atlantic Ocean. The World Health Organization has an office in the city. Many people in Brazzaville work there or in government offices.

An African village known as Ntamo once stood on the site. In the late 1800s the French took over Ntamo and renamed it Brazzaville. They later made



People attend a church in Brazzaville. Most of the people in the Republic of the Congo practice some form of Christianity.

Brazzaville the capital of the French colonies in west-central Africa.

The Republic of the Congo became an independent country in 1960. Brazzaville became its capital. Civil war broke out in the country several times in the late 20th and early 21st centuries. The city was often the site of fighting.

► More to explore

Congo, Republic of the

Brick and Tile

Brick and tile are two different but closely related building materials. Both are made from a mixture of clay, sand, and other fine particles called silt.

Brick

Brick is one of the world's oldest building materials. Making bricks is easier than cutting and hauling stone for building. The basic steps in brick making are the same today as they were thousands of years ago. First, workers dig up the clay. Sometimes they mix the clay with sand or other materials to make it stronger. Next, workers form the clay into small, rectangular blocks called bricks. After the bricks dry, workers bake, or fire, them in very hot ovens called kilns.

Builders use bricks mainly to make walls, but floors and walkways can also be made of bricks. To make strong walls, builders lay the bricks in interlocking patterns. This means that each brick lies on more than one other brick. Builders



Bricks are laid in an interlocking pattern in order to build a strong wall.

fill in the spaces between the bricks with mortar, or sand mixed with cement and water.

Tile

Like brick, tile is also made from baked clay. However, tiles are thinner than bricks. They may also be curved or cut into geometric shapes. In addition, there are more kinds of tile than of brick. Tiles made of red clay, called terra-cotta tiles, have surfaces that are easy to mold. This type of tile has long been used for covering roofs.

When tiles are coated with glaze and then fired at high temperatures, they are called ceramic tiles. The glaze gives them a shiny, colorful appearance and makes them waterproof. Ceramic tiles cover the walls and floors of many kitchens and bathrooms.

Today some tiles are made from plastic and other artificial materials. Artificial tiles cover walls and floors in many modern buildings.

History

The ancient Babylonians made brick houses 6,000 years ago. The ancient Egyptians, Greeks, and Romans also built with bricks and tiles. The Romans were especially good at making tiles. They even used tiles to build pipes that carried water. Native Americans in dry regions built houses with adobe, or sun-dried, bricks.

Early builders often made their bricks right at the construction site. In the 1800s people developed new and faster ways of making bricks and tiles. Factories began producing them in large quantities. Today many builders use newer construction materials such as concrete and cinder blocks. Nevertheless, brick and tile are still popular building materials. They are also commonly used in drainage systems.

► More to explore

Adobe • Clay • Sand



Blue and white tiles decorate steps in Portugal.

Bridge

A bridge is a structure that allows people and vehicles to cross over an open space. Bridges span, or stretch across, deep pits in the earth, bodies of water, and roads.

Types of Bridges

The beam bridge is the oldest, simplest, and most common type of bridge. A beam bridge is a horizontal, or level, structure. It has a support on each end. Other supports, called piers, may also hold up the bridge between the two

ends. A log or a plank that crosses a stream is a beam bridge in its most basic form. Modern beam bridges are usually made of steel beams, called girders. Most highway bridges are beam bridges.

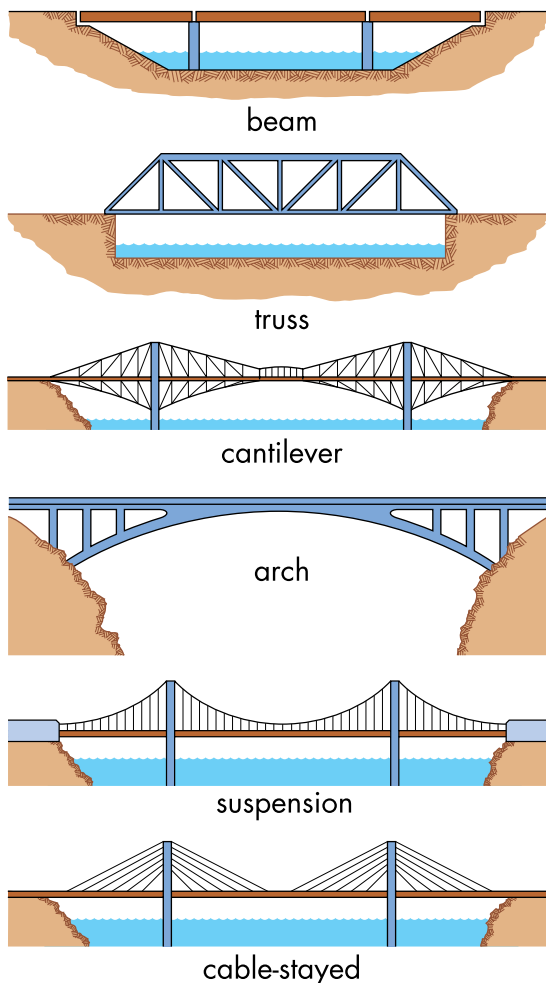
Like the beam bridge, the truss bridge has a support at each end. It may also rest on piers in between. But a truss bridge is stronger than a simple beam bridge. A framework of metal or wood bars connects the two ends of the bridge. These bars fit together in triangular shapes. They often form a sort of tunnel through which the roadway passes.

The cantilever bridge is made up of structures called cantilevers. A cantilever is a beam that has a pier at only one end, like a diving board. A framework of many bars adds strength to the beam, as in a truss bridge. At least two of these beams stretch toward each other to form a cantilever bridge.

Like the beam bridge, the arch bridge is a very old design. An arched structure built beneath the bridge's roadway provides its support. Arch bridges often span rivers and valleys.

In the suspension bridge, the roadway hangs from strong wires called cables. The main cables hang between two or more towers. Smaller cables hang down from the main cables. The smaller cables hold up the roadway. Suspension bridges can span longer distances than any other type of modern bridge.

A cable-stayed bridge also uses cables to support the roadway. Its cables run



There are six basic bridge forms. They are the beam, the truss, the cantilever, the arch, the suspension, and the cable-stayed.

directly between the towers and the roadway. They attach to the roadway in straight, diagonal lines.

Some types of bridges are movable. Some may open upward to allow tall ships to pass underneath. Others may turn sideways. Still others, called pontoons, float on water.

History

Early humans built bridges from logs, branches, or stones. They also made suspension bridges with long, tough vines. The ancient Romans built many stone arch bridges that still exist today.

Modern bridge building began in the 1700s. People began building bridges from iron and, later, steel. These metals were stronger and often cheaper than stone. By 1850 some bridges were strong enough to support trains. Concrete became a popular bridge material in the 1900s. Today engineers continue to improve bridge-building techniques.

► More to explore

Concrete • Road • Steel

Bridgetown



Population
(2004
estimate), urban
area, 99,100

Bridgetown is the capital of Barbados, an island country in the Caribbean Sea. About half the country's people live in the Bridgetown area. The city has the only seaport in Barbados. Shipping, banking, and tourism bring money to Bridgetown. Factories in the city process sugar and rum.

For a long time Barbados was a British colony. The British founded the town in 1628. Fires destroyed much of Bridgetown several times. A disease known as cholera killed about 20,000 people there in 1854. In 1966 Barbados became an independent country with Bridgetown as its capital.

► More to explore

Barbados



Romans built the Pont du Gard more than 2,000 years ago. The bridge crosses the Gard River in southern France.



British Columbia

Canada's only Pacific coast province is British Columbia. It is a scenic land of snowcapped peaks, rushing rivers, and rugged seacoasts. British Columbia was one of the last parts of North America to be explored by Europeans. The capital is Victoria.

Geography

Only the southern half of British Columbia has a coastline on the Pacific Ocean. The northern half borders the U.S. state of Alaska to the west. North of British Columbia are Yukon and the Northwest Territories. Alberta lies to the east. The U.S. states of Montana, Idaho, and Washington are to the south.

Most of British Columbia is mountainous. The ranges include the Rocky Mountains and the Coast Mountains. Between the mountains are plateaus and valleys. Most of British Columbia's rivers, including the Fraser and the Columbia, flow to the Pacific Ocean. Along the coast are hundreds of islands. The largest is Vancouver Island in the southwest.

People

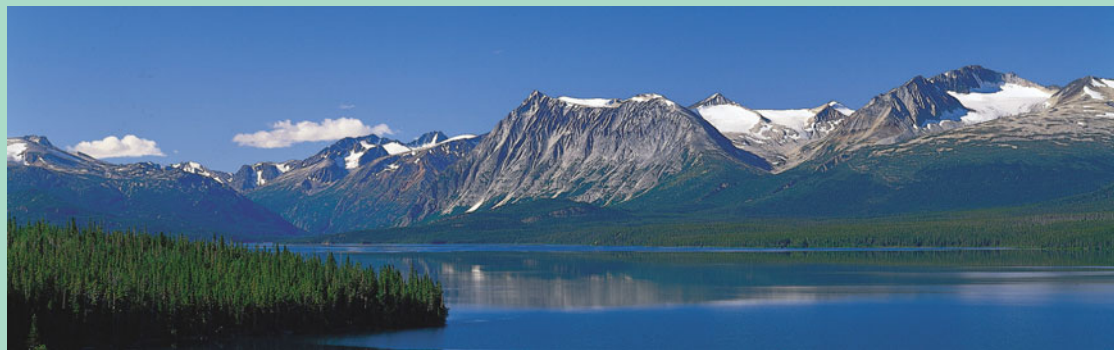
About two thirds of British Columbia's people have roots in Great Britain or Ireland. Many others have ancestors from Asia, especially China. British Columbia has a greater variety of American Indian peoples than any other part of Canada. They include the Kwakiutl, the Nootka, the Haida, and the Salish (Flathead).

Most of British Columbia's people live in the south, near the U.S. border. About 85 percent of the people live in cities or towns. Vancouver is the largest city in the province and the third largest in Canada. Victoria is the second largest city.

Economy

Natural resources are key to the economy of British Columbia. Huge forests, especially along the coast, provide wood that is made into lumber, wood pulp, and paper. Fishing in the rivers and off the coast brings in valuable catches of salmon, halibut, herring, and shellfish. Seafood processing is an important industry. Mines in the prov-





The Coast Mountains overlook the Torres Channel in northern British Columbia.

ince produce copper, gold, zinc, coal, natural gas, and oil. British Columbia does not have much good farmland because the land is too mountainous. But farmers grow fruits and vegetables and produce dairy products.

Most workers in British Columbia have jobs in service industries such as tourism, finance, real estate, health care, and sales. Millions of people visit the province each year, especially to see its spectacular scenery. The money those people spend is important to the economy.

History

About 80,000 American Indians lived in what is now British Columbia when European explorers arrived. The British sea captain James Cook visited the coast in 1778. In 1792 another British explorer, George Vancouver, sailed around the island that was later named for him. In 1793 the Scottish explorer and fur trader Alexander Mackenzie reached the Pacific coast after traveling overland from the east. Fur-trading companies, including the Hudson's Bay Company, set up trading posts and forts in the region.

In the 1800s Americans began to settle in the region that is now Washington and Oregon. For years the British and U.S. governments disagreed about the border between their lands. In 1846 the border was set, and Vancouver Island became British territory. In 1849 the British made the island a colony.

Gold was discovered on the Fraser River in 1858, and thousands of people came to the mainland in search of riches. The mainland was made a colony that same year. In 1866 the island and the mainland were combined to form the colony of British Columbia. In 1871 British Columbia became a province of Canada. A railroad linking the province with eastern Canada was completed in 1885. This helped spark much development in British Columbia. In the late 1900s it became one of Canada's leading provinces.

► More to explore

Alberta • Canada • Cook, James
 • Flathead • Fur Trade • Haida
 • Hudson's Bay Company • Kwakiutl
 • Nootka • Northwest Territories
 • Rocky Mountains • Yukon Territory

Facts About BRITISH COLUMBIA

Flag



Population
 (2006 census)
 4,113,487

Area
 364,764 sq mi
 (944,735 sq km)

Capital
 Victoria

Motto
*Splendor Sine
 Occasu* (Splendor
 Without
 Diminishment)

**When British
 Columbia
 Became a
 Province**
 1871

Bronze

Mixing the metals copper and tin creates bronze. Bronze, like other mixtures of metals, is called an alloy. Bronze is harder and stronger than copper. It also does not wear away as easily as either copper or tin. For these reasons bronze is often used to make tools and machinery. Bronze is also used to make electrical hardware, springs, fasteners, and coins. Bronze has been the most popular metal for making statues and other artistic objects since ancient times.

Working with Bronze

After melted bronze is poured into a mold and begins to cool, it expands. As the bronze expands, it fills in every detail of the mold. When the bronze cools further and hardens, it shrinks a little bit. This makes the final object easy to

remove from the mold. Bronze also changes colors when exposed to air and water. This effect is called a patina and can be very beautiful.

History

People first discovered how to make bronze more than 5,000 years ago. The discovery of bronze allowed ancient peoples to make tools and weapons that were stronger and longer lasting than any made before. These advances were so important that the ancient period of bronze making came to be called the Bronze Age. People later began making statues, church bells, doors, bowls, and many other objects out of bronze.

► More to explore

Alloy • Bronze Age • Metal

Bronze Age

The Bronze Age was a time in early human history when people first began to use tools made of bronze. It began in some places about 5,000 years ago. It began later in other places. Learning how to use bronze led to advances in many areas of human life.

Background

The earliest humans lived during the Stone Age. Stone Age humans made tools and weapons of stone. By about 6500 BC people had learned how to shape copper into tools and other objects.

Eventually people learned how to mix tin with copper to make bronze. They



A bronze figure of a girl was made in Greece about 2,500 years ago.



People used bronze to make daggers and other tools during the Bronze Age.

probably discovered how to do this by accident. In some places copper and tin are mixed together naturally in the ground. When ancient metalworkers melted this mixture, they made a form of bronze.

Bronze looked like copper. But it was harder and more useful for making tools, weapons, and artwork.

Events of the Bronze Age

The Bronze Age began in Greece and China before 3000 BC. Bronze Age cultures also developed in Mesopotamia (in modern Iraq), Egypt, and the Indus River valley (in modern Pakistan). The Bronze Age had spread to Great Britain by about 1900 BC. Peoples outside Europe, North Africa, Asia, and the Middle East did not have a Bronze Age.

At first only rich people could afford bronze. For a long time farmers and craftspeople used cheaper stone tools to do their work. But eventually more people did metalworking as a full-time

job. Metalworkers, other craftspeople, and farmers came together in cities to trade their goods. This helped civilizations to grow. Two new inventions—the wheel and the ox-drawn plow—also helped Bronze Age civilizations to grow.

In about 1200 BC people learned how to shape iron into tools. This began the Iron Age and ended the Bronze Age.

► More to explore

Bronze • Civilization • Iron Age • Stone Age

Brooks, Gwendolyn



Gwendolyn Brooks

The U.S. poet Gwendolyn Brooks wrote about African American life. She wrote especially about the everyday lives of blacks in cities. Her poems describe the racism and poverty that African Americans have faced.

Did You Know?

In 1985–86 Gwendolyn Brooks was the Library of Congress consultant in poetry. This is the top honor for a U.S. poet.

Gwendolyn Elizabeth Brooks was born in Topeka, Kansas, on June 7, 1917. She grew up in Chicago, Illinois. She wrote her first poem at age 7.

Brooks's first collection of poems was published in 1945. It was called *A Street in Bronzeville*. In 1950 Brooks won an award called the Pulitzer prize for her book *Annie Allen*. The poems are about a black girl growing up in Chicago. Brooks was the first African American to win a Pulitzer prize.

Brooks's most highly praised collection, *The Bean Eaters*, was published in 1960. It contains some of her most famous poems, including *We Real Cool*. Written in a simple style, *We Real Cool* describes the difficulties of poverty on youth.

In addition to poetry, Brooks wrote a novel based on her life. She also taught poetry and English at different schools throughout her career. Brooks died in Chicago on December 3, 2000.

Brown, John

As an abolitionist, John Brown wanted to end slavery in the United States. Unlike most abolitionists, however, he took the law into his own hands. Opponents of slavery admired him, but others considered him a dangerous criminal.

John Brown was born on May 9, 1800, in Torrington, Connecticut. He moved to Ohio as a child. As an adult he moved restlessly from state to state. He tanned leather and also tried other trades. He



John Brown

was married two times and had many children.

For a time he and his family lived in a black community in New York state. He had always opposed slavery, but in the 1850s he became more determined to take action against the practice.

In 1855 Brown found his way to the Kansas Territory, where groups of settlers were fighting battles over the issue of slavery. On May 24, 1856, he and his supporters killed five men at a proslavery settlement in Pottawatomie Creek.

Brown's last raid came on October 16, 1859. He and an armed band attacked a federal arsenal, or weapons storehouse, in Harpers Ferry, Virginia (now West Virginia). He hoped that thousands of slaves would rise in rebellion and follow him to a new mountain stronghold. This did not happen, and after two days he was captured by U.S. troops. Brown was tried and hanged at Charlestown, Virginia, on December 2, 1859.

► **More to explore**
Abolitionist Movement

Brunei



The country of Brunei is a small Islamic sultanate, or kingdom. It lies on the northwestern coast of the island of Borneo, also shared by Malaysia and Indonesia. Large oil and gas reserves make Brunei one of the wealthiest nations in Southeast Asia. The capital and largest city is Bandar Seri Begawan.

The South China Sea and Sarawak, a state of Malaysia, surround Brunei. Sarawak divides Brunei into two sepa-

rate parts. Coral sand beaches line the coast. The rest of the country is hilly. The climate is hot and wet. Seasonal winds called monsoons bring heavy rain.

Rain forests cover the land. Wildlife includes lions, tigers, monkeys, birds, insects, snakes, and lizards.

About two thirds of the population is Malay. About one tenth is Chinese. Other native peoples and Asians make up most of the rest. The main language is Malay, but many speak Chinese or English. About two thirds of the population is Muslim.

The country's economy depends on its large reserves of oil and natural gas. Very little manufacturing exists, aside from petroleum products. Most people work in services or construction.

In the early 1400s Brunei became an independent kingdom. By the 1500s Brunei controlled almost all of Borneo. In the 1800s Great Britain took control of Brunei. In 1959 Brunei gained partial self-government.

During the 1970s the sultan, or king, used the gas and oil profits to improve people's lives. Health care and education are still free to all citizens. Brunei became fully independent in 1984.

► More to explore

Bandar Seri Begawan • Islam



Facts About BRUNEI



Population
(2008 estimate)
400,000

Area
2,226 sq mi
(5,765 sq km)

Capital
Bandar Seri Begawan

Form of government
Monarchy

Major cities
Bandar Seri Begawan, Kuala Belait, Seria



A young boy attends school in Brunei.

Brussels



Population
(2007
estimate), city,
145,917;
Brussels-Capital
Region,
1,809,242

Brussels is the capital of Belgium, a country in northwestern Europe. Brussels and its surrounding towns make up the largest metropolitan area in Belgium. The area is one of the country's three regions, called the Brussels-Capital Region.

Many people come to Brussels to visit the city's museums, parks, and public squares. Others come to work in the government offices. The government is the largest employer in the city. Factories in Brussels process foods and make cloth, machines, electrical products, and chemicals. The city has long been



At the heart of Brussels is the Grand Place. It is a public square that began as a marketplace hundreds of years ago.

famous for its lace, carpets, furniture, and art products.

Brussels is also important as a center of European government and trade. The city is the headquarters of two major international organizations—the European Union and the North Atlantic Treaty Organization (NATO).

Brussels was settled in the 500s. It developed around a castle on an island in the Senne River. The city had many different rulers over the years. In the 1100s it began to grow as a center of the cloth trade. In the 1400s Brussels became a leading city in an area known for its art and culture. The Spanish and Austrian empires later ruled the area for about 200 years.

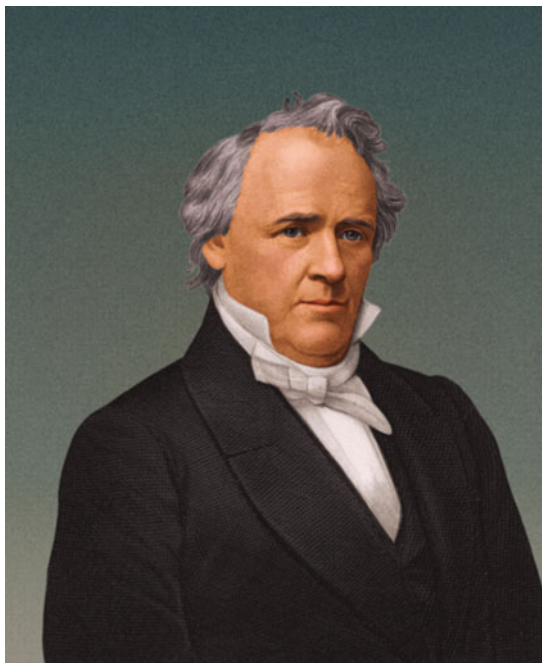
Belgium became part of The Netherlands in 1815. Brussels then shared the status of capital with The Hague. In 1830 Brussels was the main site of a revolt against The Netherlands. Belgium then became an independent country with Brussels as its capital.

► More to explore

Belgium • European Union • North Atlantic Treaty Organization

Buchanan, James

The 15th president of the United States, James Buchanan failed to solve the slavery crisis of the 1850s and 1860s. He tried to make a compromise between the North and the South but could not prevent the American Civil War.



James Buchanan was the 15th president of the United States.

Early Life

James Buchanan was born on April 23, 1791, near Mercersburg, Pennsylvania. His father was a successful storekeeper and landowner. In 1809 Buchanan graduated from Dickinson College in Carlisle, Pennsylvania. He then studied

law and became a lawyer in 1812. Buchanan never married.

Political Career

Buchanan was elected to the Pennsylvania House of Representatives in 1814. He entered the U.S. House of Representatives in 1821 and the U.S. Senate in 1834. He resigned in 1845 to become secretary of state under President James K. Polk. During that time Texas became a state. This led to a war with Mexico because Mexico claimed part of Texas. Buchanan helped settle another border dispute that came up during his time as secretary of state. The dispute was with Great Britain over the boundary between Canada and the Oregon Territory.

Buchanan ran for president twice in the 1840s but lost. He became minister to Great Britain after Franklin Pierce won the election of 1852. While in Europe Buchanan helped write the Ostend Manifesto. That report recommended



TIMELINE

Buchanan is born near Mercersburg, Pennsylvania.

April 23, 1791

Buchanan becomes secretary of state under President James K. Polk.

1845

Abraham Lincoln is elected to replace Buchanan as president.

1860

Buchanan dies in Pennsylvania.

June 1, 1868

Buchanan becomes a U.S. senator.

1834

Buchanan is elected president.

1856

Seven Southern states leave the Union before Buchanan leaves office.

1861

that the United States take Cuba from Spain, by force if necessary. The Ostend Manifesto increased Buchanan's popularity because the nation wanted to gain more territory.

Presidency

In 1856 the Democratic Party nominated Buchanan for president and John C. Breckinridge for vice president. "Buck and Breck," as they were called, won the election.

As president, Buchanan handled foreign affairs well. At home, however, he stumbled over the question of slavery. The split between the slave states of the South and the free states of the North widened. Several Southern states threatened to withdraw from the Union. Buchanan disapproved of slavery, but he wanted to hold the country together. He believed the United States might avoid a civil war if Northerners stopped protesting slavery and the government protected slave owners.

In 1860 the Democratic Party split into Northern and Southern groups. Neither group wanted Buchanan as its presidential nominee. The split led to the election of the antislavery Republican candidate, Abraham Lincoln. As Buchanan's term was ending, he could not stop seven Southern states from leaving the Union. The result was the American Civil War, which began in 1861.

Retirement and Death

Buchanan retired to his home near Lancaster, Pennsylvania, in March 1861. During his retirement, critics in both

the North and the South attacked him for his efforts at compromise. Buchanan died on June 1, 1868, near Lancaster.

► More to explore

American Civil War • Lincoln, Abraham
• Pierce, Franklin • Slavery • United States

Bucharest



Population
(2007 estimate)
1,931,838

Bucharest is the capital of Romania, a country in eastern Europe. It is the largest city in Romania. Bucharest is also a center of culture and industry. Several factories in the city make electrical equipment and various kinds of machines. Others make chemicals, cloth, clothing, and processed foods.



Culture, shopping, and industry help make Bucharest a lively city.

Did You Know?

James Buchanan was the only president who was never married.

People have lived in the Bucharest area for many thousands of years. By the mid-1400s it was part of a state called Walachia. Vlad III, the prince of Walachia, built the fort of Bucharest. The fort was intended to protect Walachia from attacks by the Turks. Eventually, however, the Turkish Ottoman Empire took over the area. Under the Turks Bucharest became the main economic center of Walachia. In 1659 Bucharest became Walachia's capital.

In 1859 Walachia became part of the new country of Romania. Bucharest was declared the capital of Romania in 1862.

In the early 1900s Bucharest grew as the most important city of a large country. During World War II (1939–45) Bucharest was damaged by bombing. After the war the center of the city was rebuilt. Building projects made the city larger and more modern.

► More to explore

Romania

Budapest



Population
(2008 estimate)
1,702,297

Budapest is the capital of Hungary, a country of central Europe. It is the larg-



A statue of Saint Stephen, the first king of Hungary, overlooks the city of Budapest.

est city in the country. Budapest is also an important center of culture, education, and science.

Budapest lies on both banks of the Danube River. The city has two main sections: Buda and Pest. These sections sit on opposite banks of the river. Several bridges connect them. Buda features many hills. Pest is fairly flat.

More than 100 natural hot springs are found in Budapest. Many spas, or resorts, are built around these springs. Partly because of this, Budapest is a major tourist site.

Budapest is also Hungary's center of transportation, manufacturing, and banking. Factories in the city make electronics, communications equipment, chemicals, cloth, and processed foods. Others make buses, railroad equipment, and boats.

In ancient times the Romans built a town on the site of Budapest. Hungarians came to the area in the 800s. They

Did You Know?

Between the later 1800s and 1918, Budapest was one of the two capital cities of the powerful empire of Austria-Hungary. Vienna, Austria, was the other.

later settled the town of Buda. Buda became the capital of the kingdom of Hungary in the 1400s. Slavic groups established Pest. German merchants later developed Pest into a trading town. Both towns came under Turkish rule for a period.

Many buildings in Budapest today date from the 1700s and 1800s. The area was then under Austrian rule. In 1873 Buda and Pest joined together to form a single city.

Fighting at the end of World War II in 1945 severely damaged Budapest. After the war Hungary established a Communist government centered in Budapest. In 1956 there was an uprising in the city against the Communist government. That rebellion failed. In the 1980s more protests led to the fall of Communism in Hungary. Budapest was the center of those protests.

► More to explore

Hungary

Buddha

The founder of Buddhism was the Buddha, a man born with the name Siddhartha Gautama. The Buddha was a man of great wisdom and compassion. He taught people how to overcome suffering.

Early Life

Siddhartha Gautama was a prince who lived sometime in the 500s to 300s BC. He was born near the border of what are today Nepal and India. Little is



Statues of the Buddha can be found in many Asian countries.

known for certain about his life, though there are many stories about him. He is said to have grown up in luxury, shielded from aging, sickness, and death.

The stories about him say that at age 29 Gautama saw a bent old man for the first time. This greatly troubled Gautama. His chariot-driver, Channa, explained that the man was old and that all people grow old. On another day, Gautama saw a sick man, and later he saw a dead body. Channa explained that all people are subject to sickness and death. Finally, Gautama saw a monk, who looked peaceful. Gautama decided to give up his wealth and become a monk. He wanted to discover how the

monk was able to look peaceful when he was surrounded by suffering.

Finding and Sharing the Truth

Gautama left home in search of the truth. One day, while Gautama was sitting and meditating under a tree, he became enlightened, or free from both desire and suffering. In this way, he became the Buddha, which means “enlightened one.”

The Buddha taught others about Four Noble Truths he discovered. The first truth is that life is full of suffering. The second is that suffering is caused by desire. The third is that humans can free themselves from all that. The fourth truth told the way to achieve this freedom.

The Buddha soon attracted followers, who formed the first Buddhist order, or sangha. The Buddha sent them out into the world to spread his message. The Buddha himself set out traveling, converting many people on the way. He is said to have died at age 80, in a city called Kusinara (now Kasia, India).

► **More to explore**
Buddhism

Buddhism

The religion based on the teachings of the Buddha is known as Buddhism. The Buddha was born with the name Siddhartha Gautama and lived sometime in the 500s to 300s BC. He became enlightened, meaning that he found a way to free himself from the



A Buddhist monk beats a drum while other monks pray.

cycle of desire and suffering. The Buddha taught his followers how to achieve this too.

Buddhism began in India and spread to central and southeastern Asia, China, Korea, and Japan. It plays a central role in the spiritual, cultural, and social life of Asia. Today some people in the Western world also follow Buddhism. At the beginning of the 21st century Buddhism was the fourth-largest religion in the world, with about 360 million followers.

Some Important Buddhist Holidays	
Holiday	Date
<i>Mahayana Countries</i>	
Buddha’s birthday	April 8
Buddha’s enlightenment	December 8
Buddha’s death	February 15
Note: Different countries celebrate these holidays on different dates.	
<i>Theravada Countries</i>	
Wesak (Buddha’s birthday, enlightenment, and death)	one day, usually in May, when there is a full moon

Beliefs and Practices

Buddhism is based on the Buddha's teachings, which are called the Four Noble Truths. The first truth is that life is made up of pain and suffering. The second is that all suffering is caused by one's desires. The third is that one can be free of these desires. The freedom from desire is called nirvana. The fourth truth is the Eightfold Path, which explains eight ways to achieve nirvana.

The Eightfold Path is also called the Middle Path. It teaches that people should not indulge in too much luxury and pleasure. But they should also not harshly deny themselves all worldly comforts. Instead, people should take a middle, or balanced, course.

Buddhism has three main parts. These parts are called the Triratna, or "the three jewels." They are: the Buddha, or the teacher; the dharma, or the teaching; and the sangha, or the community of believers. Buddhist monks believe that the three jewels protect them. This is expressed in the Buddhist prayer, "I take



Buddhist monks wear simple robes and often live in communities called monasteries.



Prayer flags line a walkway near the site where the Buddha experienced his enlightenment.

refuge in the Buddha. I take refuge in the dharma. I take refuge in the sangha."

Divisions

Many years after the Buddha's death two major groups appeared among his followers. One group followed a branch known as Theravada, meaning "Way of the Elders." It is the older and more conservative branch of Buddhism. Many people in Sri Lanka, Myanmar, Thailand, Laos, and Cambodia belong to this group.

The other group is called Mahayana. This form of Buddhism is popular in Mongolia, China (including Tibet), Japan, Korea, Vietnam, and Nepal. Zen Buddhism comes from Mahayana Buddhism.

The Theravada Buddhists concentrate on freeing themselves through improving their own lives. Mahayana Buddhists believe they can achieve enlightenment through a life of good work for others.

History

The Buddha began teaching his philosophy after receiving enlightenment. One day he sat down under a tree in Bodhi Gaya (now in the state of Bihar in India) and began meditating. On the 49th day, he achieved enlightenment and so was freed from suffering. He became known as the Buddha, which means “enlightened one.”

According to tradition, the Buddha lived and taught for 45 years after his enlightenment. The Buddha preached in Pali, which was the language of the common people. He believed that his teachings were for everyone and not just scholars. However, he did not write down his teachings. The Buddha’s followers shared his teachings with other people by word of mouth. These teachings were not put in writing until many years after the Buddha’s death.

The Buddha established a religious order known as the sangha. Many of its members were wandering monks, as the Buddha himself had been. After the Buddha’s death, these monks helped spread Buddhism through northern India. In the 200s BC Buddhism gained a powerful sponsor. Asoka, the ruler of an empire that spanned most of South Asia, embraced and promoted the religion. He built many Buddhist monuments and monasteries.

Buddhism later declined somewhat in India. But from India, Buddhism spread to Sri Lanka and Southeast Asia as well

as through central Asia and Tibet and into China, Korea, and Japan.

► More to explore

Buddha • Monk

Buenos Aires



Population

(2001 census),
city, 2,776,138;
urban area,
11,460,575

Buenos Aires is the capital of Argentina, a country of southern South America. It is one of the largest cities in South America. The city is a center of business, politics, and culture. Buenos Aires is also a leading port. It lies on the Paraná River near the Atlantic Ocean.



The Plaza de la República is one of the major public squares in Buenos Aires.

Cityscape

Buenos Aires has many plazas and parks. Its most important public square is the Plaza de Mayo. The home of Argentina's president and other government buildings surround the square.

There are also many museums and other cultural sites in Buenos Aires. The Colón Theatre is a well-known opera house. It is also home to the national ballet and symphony. Buenos Aires is also known as a center for popular dance and music. The dance called the tango was born there in the late 1800s.

Economy

The port at Buenos Aires is the largest in South America. Shipping goods through the port is important to the city's economy. Manufacturing and service industries also bring money to Buenos Aires. Factories in the city process foods, work metals, put together cars, and process oil. Others make cloth, paper, and chemicals. Printing, publishing, and banking are also important.

History

The Spanish founded Buenos Aires in 1580. The city grew gradually over the next 200 years. In 1776 Buenos Aires became the capital of a large Spanish province. Buenos Aires grew rapidly as a center of trade. In the early 1800s Argentina became free of Spanish rule. Buenos Aires became its capital in 1880.

During the 1900s the city's industries grew. Buenos Aires suffered economic problems in 2001. Afterward the

economy began to grow again. But poverty and crime had become larger problems in the city.

► More to explore

Argentina

Buffalo

Buffalo are mammals of Africa and Asia. The American bison is often called a buffalo, but it is not a true buffalo. Buffalo are closely related to bison, cattle, and yaks.

There are several types of buffalo. The Cape buffalo lives in Africa, often in grasslands or plains. It is also called the African buffalo.

The buffalo of Asia include the water buffalo, the anoa, and the tamarau. The water buffalo can be found wild in Southeast Asia. It lives in swamps, forests, and grasslands near water. People raise water buffalo as farm animals in Asia and other parts of the world. They use these animals to pull farm equip-

Did You Know?

The people of Buenos Aires call themselves *porteños* because Buenos Aires is a port city.



The Cape buffalo is the only kind of buffalo that lives in the wild in Africa.



People in Asia use water buffalo for many different purposes. The animals pull plows and carry heavy loads. They even provide transportation.

ment and to carry heavy things on their backs. People also keep water buffalo for their milk and meat. Anoa and tamarau live in forests in Southeast Asia. Wild buffalo have become rare in Asia.

Buffalo are heavily built animals. They range in height from about 2.5 to 6.5 feet (0.75 to 2 meters). Some kinds have large, curving horns. Other kinds have straight horns. All buffalo have hooves on their feet. Most buffalo are mainly black, brown, or gray.

Except for anoa, buffalo in the wild live in groups called herds. They spend a lot of time eating and digesting grasses. To digest their food, they swallow it and later bring it back up to the mouth to chew. This makes the food easier to digest when they swallow it a second time.

► More to explore

Bison • Cattle • Mammal • Yak

Buffalo Bill

► see Cody, William Frederick.

Bujumbura



Population
(2004 estimate)
340,300

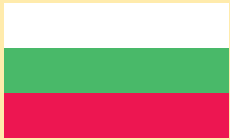
Bujumbura is the capital of the central African country of Burundi. The city lies on Lake Tanganyika. It is the country's main port and only large city. The city was once called Usumbura. The Germans took it over in the 1890s. Belgium later controlled the area. In 1962 Burundi became an independent country. The city was then renamed Bujumbura and made the capital. It was the center of a violent conflict in the late 20th and early 21st centuries.

► More to explore

Burundi



Traditional dancers perform in Bujumbura.



Bulgaria

The Republic of Bulgaria lies on the Balkan Peninsula in the southeastern corner of Europe. The neighboring Turks of the Ottoman Empire controlled Bulgaria for almost 500 years. The capital is Sofia.

Geography

Bulgaria's only coastline is on the Black Sea, to the east. The Danube River forms most of Bulgaria's northern border with Romania. Bulgaria also shares borders with Serbia, Macedonia, Greece, and Turkey.

The Balkan Mountains stretch across the country. The Maritsa River runs through the central Thracian Plain, a farming area. Much of Bulgaria has a continental climate with warm summers and cold winters. Highlands tend to be wetter than the low-lying farming areas.



People stroll along a boulevard and dine at sidewalk cafés in Varna, Bulgaria.

Plants and Animals

Evergreen trees cover the mountain slopes. The lowland areas have largely been cleared for farming. Deer, bears, wolves, badgers, wild boars, and wildcats may be found in the more remote regions.

People

Ethnic Bulgarians make up almost 85 percent of the population. The only significant minority groups are Turks and Roma (Gypsies). Bulgarians are Slavic people who write their language in the Cyrillic (Russian) alphabet. Bulgaria's traditional religion is a branch of Eastern Orthodox Christianity. More than two thirds of Bulgaria's people live in cities.

Economy

Businesses that serve the public, government work, manufacturing, and mining are the most important parts of Bulgaria's economy. Bulgaria has deposits of coal, iron, copper, petroleum, and natu-



Rock formations in the Balkan Mountains are surrounded by walls and other fortifications. Centuries ago many different groups used the area to protect against enemies.

ral gas. Manufacturers make petroleum products, machinery, and clothing.

About one fifth of Bulgarians work in agriculture, logging, and fishing. Leading crops are wheat, corn, barley, sunflowers, and grapes. Bulgarians also grow roses. The flower's oil is used in perfume. Sheep, pigs, goats, and cattle are the main livestock.

History

What is now Bulgaria was part of an ancient region known as Thrace. In the 1st century AD the Roman Empire took over Thrace. Slavs invaded in the 5th and 6th centuries. The Bulgars, a Turkic people from north of the Black Sea, defeated the Slavs and gave their name to the country.

In the following centuries the Bulgars and the Slavs became one people and converted to Christianity. Two Bulgarian empires followed. The Byzantine Empire defeated the first empire in about 1018.

The second arose in 1185 but fell to the Islamic Ottoman Empire in 1396. Bulgarians lost their independence for about 500 years, but most of them did not convert to Islam.

An uprising against the Ottomans failed in 1876. Two years later, with Russian help, Bulgaria gained partial independence. Bulgaria's leader Prince Ferdinand declared the country fully independent in 1908. Bulgaria then became involved in two wars with its neighbors on the Balkan Peninsula, as well as the two world wars.

After World War II the Bulgarian monarchy fell. Bulgaria became a Communist state under the influence of the Soviet Union. After the fall of Communism Bulgaria held elections in 1990 and worked to build a democratic government.

► More to explore

Balkan Peninsula • Ottoman Empire
• Rom • Sofia

Facts About BULGARIA



Population
(2008 estimate)
7,569,000

Area
42,858 sq mi
(111,002 sq km)

Capital
Sofia

Form of government
Republic

Major cities
Sofia, Plovdiv,
Varna, Burgas,
Ruse

Bunche, Ralph

U.S. diplomat Ralph Bunche won the Nobel peace prize in 1950. A diplomat is a person who helps countries to make agreements. Bunche won the Nobel prize in honor of his efforts to make peace in the Middle East.

Ralph Johnson Bunch (his family added the final “e” later) was born on August 7, 1904, in Detroit, Michigan. In about 1916, after his parents died, he moved in with his grandmother in Los Angeles, California. Bunche was a good student and a good athlete. He earned a degree from Harvard University in 1934. He then taught at Howard University in Washington, D.C.

During World War II Bunche helped to plan the United Nations (UN), a peaceful organization of many countries. He joined the UN staff in 1947. In 1949 Bunche helped Israel and several Arab nations to make a peace agreement. For this work he won the 1950 Nobel prize for peace. Bunche later led other peace missions. He also worked on the UN program for peaceful uses of atomic energy.

Bunche was involved in the civil rights movement as well. He wanted to help fellow African Americans gain rights to such things as better jobs and education. He was one of the leaders of the National Association for the Advancement of Colored People (NAACP) for more than 20 years. In 1963 he received the Presidential Medal of Freedom.

Bunche died on December 9, 1971, in New York City.

► More to explore

Arab-Israeli Wars • Civil Rights Movement • Nobel Prize • United Nations

Bunyan, Paul

Many years ago in U.S. lumber camps, loggers dreamed up wild stories about a mythical lumberjack, Paul Bunyan. According to these “tall tales,” neither giant mosquitoes nor rains that lasted for months bothered Bunyan or his companion, Babe the Blue Ox. Other stories told how Bunyan created the Grand Canyon. The Great Lakes were said to have formed when his huge footprints filled up with water.

The tales of Paul Bunyan first appeared in print in 1910 in a newspaper. Two books published in the 1920s helped to turn Bunyan into a national folk hero.

► More to explore

Storytelling



Giant statues of Paul Bunyan and Babe the Blue Ox greet visitors to a park in California.

Did You Know?

Bunche was the first African American, and the first black person from any country, to win a Nobel prize in any category.

Burkina Faso



Located in West Africa, Burkina Faso was once named Upper Volta after the branches of the Volta River that flow through it. Ouagadougou is the capital.

Burkina Faso is surrounded by Mali, Côte d'Ivoire, Ghana, Togo, Benin, and Niger. Much of the land is flat. The climate is generally hot and dry, but there is a rainy season. The north is part of the Sahel, a semidesert region. The south is semitropical, with wetlands and forests.

Grassland or desert covers much of the country. Wildlife includes antelope, lions, elephants, buffalo, hippopotamuses, monkeys, and crocodiles.

Nearly half of the people belong to the Mossi ethnic group. Others include Fulani, Lobi, Bobo, and Mande. French is the official language, but most people speak Moré. About half of the people are Muslims. The rest follow traditional religions or Christianity. More than 80

percent of the people live in small towns or villages.

Most of the people are farmers. Sorghum, millet, corn, and cotton are the main crops. Farmers also raise goats, sheep, cattle, and chickens. Manufacturers make sugar, cooking oil, flour, beverages, and bicycles. The country also has deposits of gold and manganese.

In the 1400s Mossi and Gurma peoples set up kingdoms in the area. In the late 1800s France took control of the region. It created the colony of Upper Volta in 1919. Upper Volta gained independence in 1960. Since then, the military has overthrown the elected government several times. In 1984 the government renamed the country Burkina Faso, which means “Land of Incorruptible People.”

► More to explore

Africa • Ouagadougou



Burkina Faso has many small villages.



Facts About BURKINA FASO



Population
(2008 estimate)
14,391,000

Area
103,456 sq mi
(267,950 sq km)

Capital
Ouagadougou

Form of government
Republic

Major cities
Ouagadougou,
Bobo-Dioulasso,
Koudougou,
Ouahigouya,
Banfora

Burma

► see Myanmar.

Burn and Scald

A burn is damage to the skin caused by fire, hot surfaces, chemicals, electricity, or radiation. Radiation is energy that comes from the sun, tanning lamps, X-rays, some cancer treatments, and other sources. Burns caused by hot liquid or steam are called scalds.

How Burns Affect the Body

Doctors classify burns based on how many layers of skin are damaged. First-degree burns affect only the outer layer, called the epidermis. They make the skin red and sore. Sunburns are first-degree burns. Second-degree burns damage the epidermis and some of the

underlying layer, called the dermis. They are red and painful, and they may blister.

Third- and fourth-degree burns are very serious. Third-degree burns damage all of the epidermis and the dermis. Sometimes they reach the fatty tissue beneath. The skin turns leathery and feels numb. Fourth-degree burns go even deeper. They destroy the fatty tissue and may damage the muscles or bone below. They turn the skin black.

Serious burns cause a condition called shock. The victim grows pale and is confused and anxious. Later the blood pressure drops sharply, and the person may collapse. Shock happens because a burn damages the blood vessels in the skin. This causes the blood to lose important fluid. This change in the blood affects all body systems.

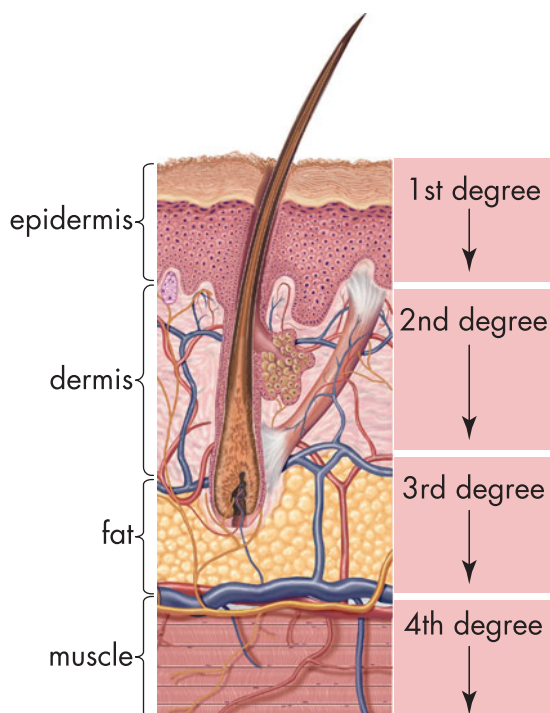
Treatment

People can usually treat first-degree burns themselves. The first thing to do is to run cool water over the burn. This stops the burning process. Then they should clean the burn with soap and water. Small burns can be left uncovered to heal. Larger burns can be covered with a bandage.

Large second-degree burns and all more serious burns should be treated quickly by a doctor. Doctors give the person fluids to stop shock and drugs to prevent infection.

► More to explore

Fire • Skin



Burundi



Burundi is a country in central Africa. It has lost hundreds of thousands of people to violence between its Hutu and Tutsi ethnic groups. The capital of Burundi is Bujumbura.

Burundi is bordered by Rwanda, Tanzania, and the Democratic Republic of the Congo. Burundi lies close to the equator. Areas near the equator usually have a hot climate. But Burundi's high moun-

tains keep temperatures mild. There are dry and rainy seasons each year.

Trees cover the mountain slopes. Grasslands cover the lower areas. Wildlife includes lions, leopards, crocodiles, buffalo, warthogs, and baboons.

More than 80 percent of the people are Hutu. Only about 15 percent are Tutsi, but they have traditionally controlled the government and the military. The official languages are Rundi and French. Christianity is the main religion.

The people of Burundi live mainly by farming. Coffee and tea are important exports. Farmers also grow bananas, sweet potatoes, cassava, beans, sugarcane, and corn. A few manufacturers make beverages, cooking oil, and sugar.

The first people in what is now Burundi were probably the Twa Pygmies. The Hutu likely arrived by the 11th century. The Tutsi followed 300 or 400 years later. Tutsi kings then took control of the region.

In the early 1900s Germany and then Belgium gained control of the area. In 1962 part of the territory became the independent monarchy of Burundi. Fighting soon broke out between the Tutsi and Hutu. Burundi's civil war continued into the 21st century.

► **More to explore**
Africa • Bujumbura



Facts About BURUNDI



Population
(2008 estimate)
8,691,000

Area
10,740 sq mi
(27,816 sq km)

Capital
Bujumbura

Form of government
Transitional government

Major cities
Bujumbura,
Gitega, Muyinga,
Ngozi, Ruyigi



Drummers in Burundi often perform at important events.

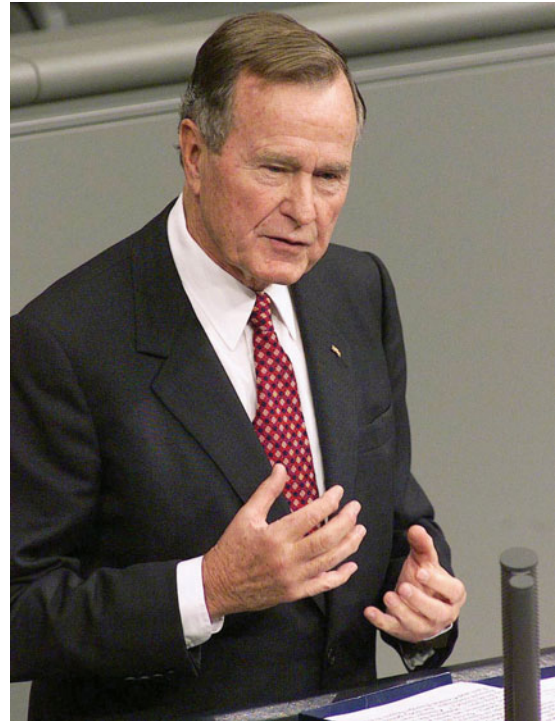
Bush, George

After serving two terms as vice president, George Bush became the 41st president of the United States in 1989. The main event of Bush's presidency was the Persian Gulf War.

Early Life

George Herbert Walker Bush was born on June 12, 1924, in Milton, Massachusetts. His family later moved to Greenwich, Connecticut. George was the second of five children born to Prescott Sheldon Bush and Dorothy Walker Bush. His father was a banker and later a U.S. senator.

In 1942 Bush joined the U.S. Naval Reserve. As a Navy pilot, he flew many missions in the Pacific during World War II. In 1945 Bush married Barbara Pierce. After the war he attended Yale University and earned a degree in economics. Bush then moved to Texas,



George Bush was the 41st president of the United States.

where he helped start three companies dealing in oil and drilling equipment.

Political Career

As a member of the Republican Party, Bush ran for the U.S. Senate in 1964



TIMELINE

Bush is born in Milton, Massachusetts.

June 12, 1924

Bush is elected to the U.S. House of Representatives.

1966

Bush becomes the head of the Central Intelligence Agency.

1976

Bush is elected vice president under President Ronald Reagan.

1980

Bush is elected president.

1988

The United States and allies defeat Iraq in the Persian Gulf War.

1991

Bush loses the presidential election to Bill Clinton.

1992

but lost. Two years later he was elected to the House of Representatives. In 1970 he gave up his House seat to run again for the Senate. Again he lost.

President Richard Nixon then made Bush the U.S. ambassador to the United Nations. From 1974 to 1976 he represented the United States in China. Bush then spent a year as director of the Central Intelligence Agency.

In 1979 Bush ran for president. He withdrew from the race in 1980 to become Ronald Reagan's vice presidential running mate. The Reagan-Bush team easily defeated President Jimmy Carter and Vice President Walter F. Mondale. Reagan and Bush were reelected in 1984.

Presidency

In 1988 Bush again decided to run for president. He chose Senator Dan Quayle as his running mate. Bush defeated the Democratic candidate, Michael Dukakis, and was sworn in as president in January 1989.

President Bush was especially interested in foreign policy. In December 1989 he ordered a military invasion of Panama to topple that country's dictator, Manuel Noriega.

In August 1990 the Middle Eastern country of Iraq invaded Kuwait. Bush formed an international alliance and sent U.S. military forces to Saudi Arabia to convince Iraq to leave Kuwait. When Iraq refused, Bush ordered an air attack. The Persian Gulf War, which lasted

from mid-January to late February 1991, ended with the freeing of Kuwait. The U.S. victory made Bush very popular.

Bush's popularity soon fell, however, as the U.S. economy suffered. In addition, Bush broke his promise not to increase taxes. In 1992 Bush lost the presidential election to Bill Clinton. Bush retired to Houston, Texas.

Political Heirs

Bush and his wife had four sons and two daughters. His first son, George W. Bush, served as governor of Texas before being elected president in 2000. Another son, Jeb Bush, became governor of Florida in 1998.

► More to explore

Bush, George W. • Carter, Jimmy
• Clinton, Bill • Persian Gulf War
• Reagan, Ronald • United States

Bush, George W.

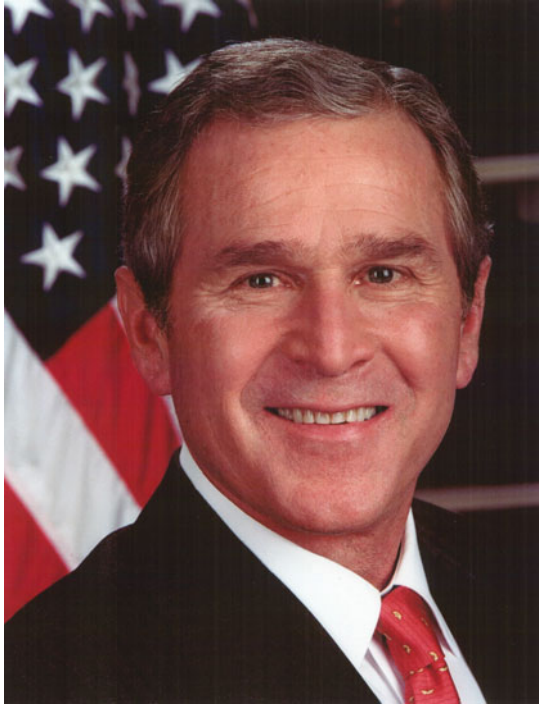
The son of former president George Bush, George W. Bush became the 43rd president of the United States in 2001. A Republican, Bush won the office in one of the closest presidential elections in U.S. history. In 2004 voters elected Bush to a second term.

Early Life and Career

George Walker Bush was born on July 6, 1946, in New Haven, Connecticut. The eldest son of George and Barbara Bush, he grew up in Midland and Houston, Texas. In 1968 he graduated from Yale

Did You Know?

George Bush was the first person since 1836 to be elected president while serving as vice president.



George W. Bush was the 43rd president of the United States.

University with a degree in history. He then served as a pilot in the Texas Air National Guard. In 1973 he began studying at Harvard University. He graduated in 1975 with a master's degree in business.

Bush returned to Midland and started an oil business. In 1977 he married Laura Welch. The couple had twin daughters. In 1978 Bush ran for a seat in the U.S. House of Representatives but lost. He worked as an adviser and speechwriter on his father's campaign during the 1988 presidential election. Bush then joined a group that bought the Texas Rangers baseball team.

Governor

In 1994 Bush ran for governor of Texas and won. He reformed Texas' welfare system and fought crime. He also cut taxes and increased spending for schools. Bush was reelected in 1998 with a record 69 percent of the vote.

Election of 2000

In 2000 Bush ran for president with Richard Cheney as his vice presidential running mate. His opponent was Al Gore, vice president under President Bill Clinton.



TIMELINE

Bush is born in New Haven, Connecticut.

July 6, 1946

Bush defeats Al Gore in the presidential election.

2000

Bush is elected governor of Texas.

September 11, 2001

Terrorists crash airplanes into the World Trade Center and the Pentagon.

The United States attacks the Taliban rulers in Afghanistan.

October 2001

Bush defeats John Kerry to gain a second term as president.

March 20, 2003

U.S. and allied forces invade Iraq.

2004

In the election more people voted for Gore than for Bush. But in a presidential election a candidate must win the votes of a group of people known as the electoral college. That contest was very close. The outcome depended on Florida, as both candidates needed its electoral votes to win. The vote in Florida was also very close, and for several weeks Florida recounted its votes. Eventually the U.S. Supreme Court stopped the recounts. That decision made Bush the winner in Florida and the next president. Bush took office on January 20, 2001.

Presidency

Bush had the advantage of working with a Republican-led Congress. Soon after his election he signed a major tax cut into law.

Bush faced his greatest challenge on September 11, 2001. Thousands died after terrorists flew hijacked airplanes into the World Trade Center in New York City and the Pentagon in Washington, D.C. Bush called for a global war on terrorism. He identified Osama bin Laden, the leader of a group called al-Qaeda, as the main suspect in the attacks. Bush ordered air attacks against the government of Afghanistan, which he accused of helping bin Laden. The government fell by the end of the year.

In 2002 Bush turned his attention to Iraq. Bush accused Iraq's president, Saddam Hussein, of supporting al-Qaeda and of having banned weapons. In March 2003 a U.S.-led force invaded Iraq. Within a few months the force

overthrew Iraq's government, and in December Saddam was captured. U.S.-led troops remained in Iraq to help the country form a new government. However, fighting continued.

Many people protested the war, as well as the poor U.S. economy. Nevertheless, in 2004 Bush was elected to a second term. He defeated Democrat John Kerry.

During his second term Bush appointed two people to the Supreme Court. But he continued to face problems related to the ongoing war and the economy. These issues made Bush and other Republicans very unpopular. They helped Democrat Barack Obama defeat Republican John McCain in the presidential election in 2008. Bush left office in January 2009 and returned to private life in Texas.

► More to explore

Bush, George • Clinton, Bill • Electoral College • Iraq • Obama, Barack • Terrorism • United States

Butterfly and Moth

Butterflies and moths are related kinds of flying insects. There are about 100,000 species, or types, of butterflies and moths. They live in many different habitats nearly all over the world.

Physical Features

Butterflies and moths vary greatly in size. The length of their wings spread

Did You Know?

George W. Bush was the second U.S. president whose father had also been president. The first was John Quincy Adams, whose father was John Adams.

out ranges from about 0.2 inch to 12 inches (4 to 300 millimeters).

Butterflies and moths have many features in common. Like all insects, they have six legs. Most adults have two pairs of wings. Dustlike scales cover the wings, body, and legs.

There are several differences, however, between butterflies and moths. Butterfly antennas, or feelers, are slender and end in little knobs. Moth antennas lack these knobs. They often look like tiny feathers or threads. In addition, butterfly wings are usually brightly colored or boldly patterned. Most moths have a duller color than butterflies do.

Behavior

Most butterflies are active during the daytime, while moths generally are active at night. Nearly all butterflies and moths eat plants. The adults of many species drink a sweet liquid called nectar from flowers. As they feed, a substance called pollen rubs off on them. When they move to the next flower the pollen falls onto that flower. The pollen helps the flowers produce seeds.

Some butterflies and moths travel long distances to reach their breeding grounds. In autumn the monarch butterflies of North America fly nearly 2,000 miles (3,200 kilometers) to the south. In the spring they breed and then travel back north. This pattern of travel is called migration.

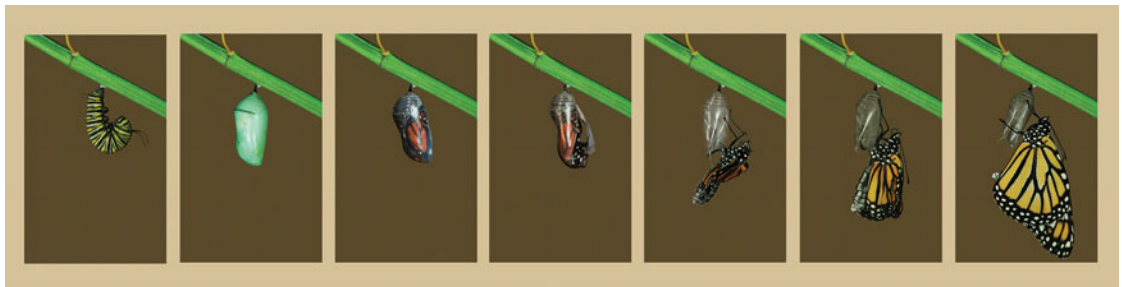
Life Cycle

Butterflies and moths change form completely over the course of their lives. This change is called metamorphosis. First, they hatch from an egg as a larva, or caterpillar. Caterpillars have no wings, and they often look like fat worms. Some kinds are hairy.

After a period of growth, the caterpillar changes into a form called a pupa. The pupa lies inactive for weeks or months while its adult features develop. Some species make a silk case called a cocoon to protect themselves during this resting stage. In fact, people get silk from the cocoons of certain moth caterpillars, called silkworms. Finally, the butterfly or moth becomes a winged adult.

► More to explore

Insect • Metamorphosis • Pollen • Silk



All butterflies and moths start out as caterpillars. Some, such as the monarch butterfly, form a cocoon to protect themselves as they become a pupa. When they are fully grown they come out of the pupa as an adult butterfly.

Byzantine Empire



The Byzantine Empire is known for its art. A mosaic showing the Empress Theodora is in the San Vitale Basilica in Ravenna, Italy.

The Roman Empire ruled a large part of Europe and northern Africa for hundreds of years. But in AD 395 it split into two parts. Invaders conquered the western part in 476. The eastern part became known as the Byzantine Empire and lived on until 1453. Its name came from the ancient city of Byzantium (now Istanbul, Turkey). This city, under the name of Constantinople, was the capital of the Byzantine Empire.

Culture

At its largest size, the Byzantine Empire extended from the Middle East to southern Spain. It included parts of southern Europe and northern Africa around the Mediterranean Sea. The people of this large empire developed a

unique culture. They made colorful pictures, called mosaics, out of broken bits of stone. They built buildings with large domes. They also replaced the Latin language with Greek.

In addition, the Byzantines created a new branch of Christianity. In 1054 the Byzantine church separated from the Christian church in the west. The western church became known as Roman Catholicism. The Byzantine church became known as Eastern Orthodoxy.

Rule of Justinian

Many emperors ruled the Byzantine Empire. One of the greatest was Justinian I. He ruled from 527 to 565. During his reign he expanded the empire and built many monuments, including a church called the Hagia Sophia. He also gave his people a famous code, or collection of laws.

Challenges and Decline

From the beginning, the Byzantine Empire faced many invasions. In the early years, groups from Europe threatened the empire's borders. The early Byzantines also fought Persians from Asia and Muslims from Arabia.

During the 1300s, Muslim Turks conquered the lands surrounding Constantinople. In 1453 the Turks captured the city. They made it the capital of the Ottoman Empire. With that the Byzantine Empire came to an end.

► More to explore

Eastern Orthodox Churches • Ottoman Empire • Rome, Ancient

Did You Know?

The Turks made the Church of Hagia Sophia into a mosque (Islamic house of worship). Now the building is a museum.

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B





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C

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The cabbages include such familiar vegetables as cauliflower, broccoli, and brussels sprouts.

(See Cabbage.)

Cockroaches have lived on Earth for more than 320 million years.

(See Cockroach.)

Red, blue, and green are the primary colors of light. The primary colors of pigments are magenta, yellow, and cyan.

(See Color.)

A meteor shower happens when Earth passes through the orbit of some comets.

(See Comet.)

Cork is made from the bark of a kind of oak tree.

(See Cork.)

Cabbage

The group of plants called cabbages includes a number of familiar vegetables. Among them are head cabbage, broccoli, cauliflower, brussels sprouts, kale, and collard. All kinds of cabbage developed from the same plant, called wild cabbage. They are grown in mild climates throughout the world.

Cabbage plants have leaves with a waxy coating. This coating usually gives the leaf a gray-green or blue-green color. The flowers have two petals and two petal-like parts called sepals. The petals and sepals are arranged in opposite pairs in the form of a cross. The flowers grow in loose clusters at the top of the stem.

Cabbages can be grouped according to the parts that are used for food. In some

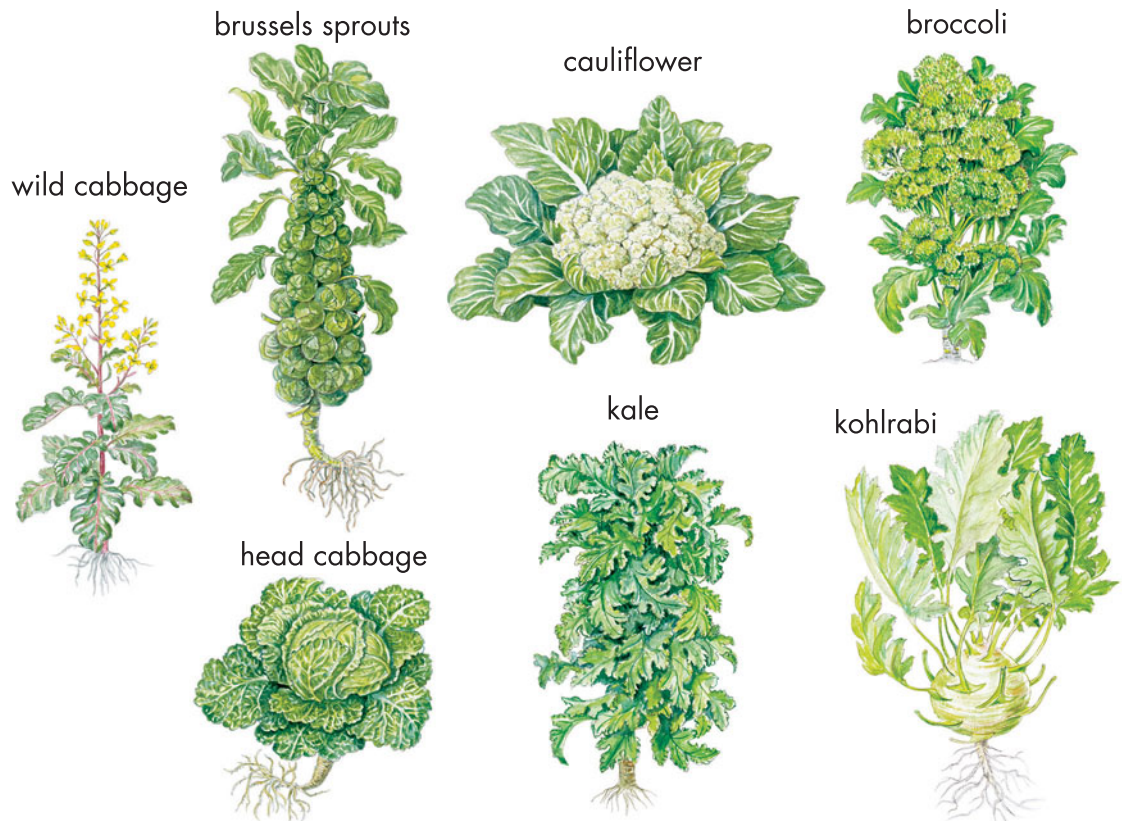
forms the leaves are eaten. These include kale, kohlrabi, head cabbage, and brussels sprouts. Kale and kohlrabi have loose leaves that spread outward from a stem. In the case of kohlrabi the stem is also eaten. Head cabbage has tightly folded leaves that form a single large head around a stem. Brussels sprouts are like head cabbages but are much smaller. Many brussels sprouts grow along a stem. Other cabbages, such as cauliflower and broccoli, have thickened flowers that are eaten.

► More to explore

Flower • Plant

Cabot, John

After the news of Christopher Columbus' famous trip to the Americas reached England, King Henry VII sent John





A picture shows John Cabot claiming what is now Canada in the name of King Henry VII in 1497.

Cabot to seek new lands for the English. Cabot reached North America in 1497. His landing led England to claim what is now Canada.

Like Columbus, John Cabot was born in Genoa, in what is now Italy, in about 1450. His original name was Giovanni Caboto. By 1461 Cabot had moved to Venice, Italy. During the 1470s Cabot sailed to the eastern part of the Mediterranean Sea as a trader. He visited Mecca, a great trading center in Arabia.

By 1495 Cabot was living in Bristol, England. He believed that he could find a short route to Asia. His plan was to sail north and west across the Atlantic Ocean. In 1496 King Henry VII agreed to the trip. Bad weather, food shortages, and conflicts with his crew forced Cabot to turn back.

The next year Cabot sailed again with a crew of 18 men on the small ship *Matthew*. On June 24, 1497, the men reached North America. They explored the coast of what is now Canada, in

either Newfoundland and Labrador or Nova Scotia. The ship may also have reached what is now the U.S. state of Maine. In August 1497 Cabot returned to Bristol.

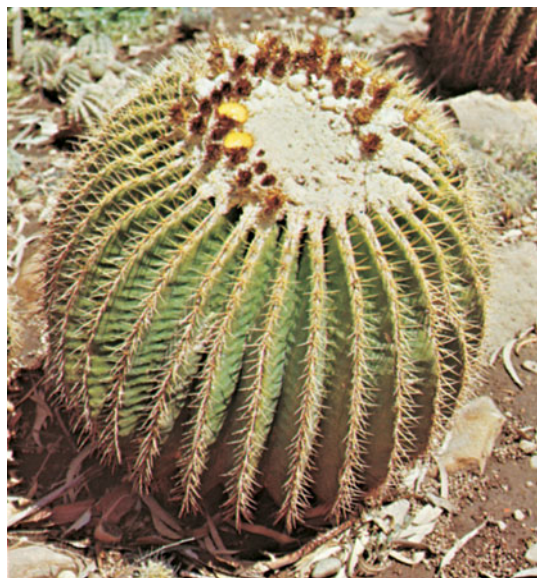
The next year the king sent Cabot on another trip. Cabot thought that he could reach Japan by sailing south along the coast he had found. Cabot left England with five ships. One ship stopped in Ireland. The other four ships never returned. Cabot may have reached North America again, or he may have died at sea.

► More to explore

Columbus, Christopher

Cactus

Cactuses, or cacti, are desert plants. They grow in dry places where other plants have trouble living. Their ability to store water keeps them alive. Cacti are



There are several different varieties of barrel cactus. In general they have strong, stiff spines and prominent ribs.



A type of cactus known as the Engelmann prickly pear commonly grows in the southwestern United States.

also protected by sharp spines, or needles. These discourage animals from eating them.

Where Cacti Grow

There are about 1,650 species, or types, of cactus. These plants grow mainly in the dry areas of the United States, Mexico, Central America, and South America. Mexico has the greatest number and variety of cacti.

Physical Features and Growth

Cacti are succulent plants. This means that they have thick tissues that take up and hold large amounts of water. The stored water keeps them alive during dry periods. Unlike many plants, cacti do not have deep roots. Instead they have roots that spread out near the surface of the soil. This is important to their survival. These roots absorb water

from a wide area during the few times it rains.

Cacti are known for their pointy spines. These grow in different patterns on the plant's surface. Some cacti also have flowers and branches. Most do not have leaves. If a cactus has leaves, they are very small and fall off as the plant grows.

Cacti come in many sizes. The cactus called the prickly pear grows in low bunches. The giant cactus known as the saguaro can be 50 feet (15 meters) tall. Its branches may be 2 feet (about 0.6 meter) thick.

Most cacti grow in the ground. Some cacti, known as epiphytes, grow on plants. Others may grow on hard things such as rocks.

Uses

Cacti are often grown for decoration. Many unusual and beautiful varieties are prized as houseplants. In South America cacti are sometimes used as fences. The U.S. state of Arizona has adopted the saguaro as its state flower.

Some types of cacti are also grown for food. The egg-shaped fruit of the saguaro can be eaten. People also eat the fruit of the prickly pear.

Caddo

The Caddo were a group of about 25 Native American tribes that originally lived in the area that is now the U.S. states of Louisiana, Texas, Arkansas, and



The Caddo people made this small human figure in the early 1800s.

Oklahoma. They built their villages on fertile lands along the Red River.

The Caddo got most of their food by farming. They grew corn, pumpkins, squash, and beans. They also used bows and arrows to hunt deer, bear, and small game animals. They lived in dome-shaped houses made from grass stuffed into a wooden frame.

In the 1540s the Caddo welcomed Spanish explorers into their territory. Spanish and French traders visited regularly by the early 1700s. The Caddo traded their corn to other tribes for animal furs. They then gave the furs to the French in exchange for European goods.

As more and more non-Indians arrived, the Caddo began to lose their lands. By the mid-1800s they fled to Indian Territory (now Oklahoma). There they settled on a reservation along the

Washita River, which they shared with the Wichita Indians.

By the end of the 20th century, there were about 3,000 Caddo in the United States. Many lived in tribal lands in Oklahoma.

► More to explore

Native Americans

Caesar, Julius

The general and dictator Julius Caesar helped to build ancient Rome into a mighty empire. The name Caesar became the Russian word tsar and the German kaiser. Both mean “emperor.”

Julius Caesar was born on July 12 or 13, in about 100 BC. His father died when Caesar was 16. Caesar’s family was patri-



Julius Caesar was a leader of ancient Rome. He built a mighty empire. This marble bust of Caesar is in the Capitoline Museum in Rome.

cian, or upper class, but they supported the common people in politics.

Rise to Power

Caesar studied public speaking and later entered politics. In 59 BC he was elected consul, the highest public office in ancient Rome. As one of two consuls, he ruled the Roman state for one year.

He then left Rome to govern a Roman province in Gaul (modern France). In nine years of fighting he brought all of Gaul under Roman rule.

Dictator of Rome

Caesar returned to Italy in January of 49 BC and made himself dictator. Five years of civil war between Caesar's forces and the supporters of the popular general Pompey followed. Pompey fled to Egypt and died there before Caesar could catch him. But Caesar continued to fight and win battles against Pompey's supporters.

When he returned to Rome, Caesar pardoned his old enemies and gained many supporters. Not everyone trusted Caesar, however. Many wanted Rome to be a republic governed by a group of people rather than a dictatorship led by one man alone.

Sixty senators agreed to a plan to kill Caesar on March 15 (the "Ides of March" in the Roman calendar), 44 BC. Among them was Caesar's friend Marcus Junius Brutus. As he died, Caesar said, "*Et tu, Brute?*" ("You too, Brutus?").

► More to explore

Augustus • Dictator • Rome, Ancient

Cairo



Population
(2006 estimate), city, 6,759,000;
(2005 estimate), urban area, 11,128,000

Cairo is the capital of Egypt, a country in northeastern Africa. It is the largest city in Africa. Cairo has long been the cultural center of the Arab world.

Places of Interest

Two areas, new and old, make up Cairo. Modern Cairo faces the Nile River. It includes the central business district and newer living areas.

In Cairo's oldest areas many people live in crowded conditions. Many ancient monuments are found there. The City of the Dead is a large section of historic cemeteries along the edge of the city. Thousands of poor people live among the tombs there. The Great Pyramids at Giza lie along the outskirts of Cairo.

Economy

Cairo has long been an important trading center. Factories in the city make cotton, processed foods, paper, cigarettes, and many other products. Most of Egypt's important banks, shipping companies, airlines, and hotels are in Cairo. The city's museums and monuments attract many tourists.

Did You Know?

The ancient Romans named the month of July in honor of Julius Caesar.



Modern Cairo's blocks of apartments, office buildings, and shops line the Nile River.

History

People have lived in the area around Cairo for thousands of years. In AD 969 Egypt's rulers at the time established a new city. It was later named Cairo.

In the 1200s Cairo became the capital of a large Muslim empire. The city thrived as a center of trade and Islamic learning and culture. Most of Cairo's greatest buildings went up during that period. After other rulers took over in the 1500s the city went into a period of decline.

In the 1860s many European-style buildings were built in new city districts. In 1922 Egypt became an independent country with Cairo as its capital. Since then the city has grown and grown.

► More to explore

Egypt • Egypt, Ancient • Nile River
• Pyramid

Calendar

A calendar is a tool used to mark the passing of time. People of ancient times

based their calendars on the most obvious regular events they knew—the changing positions of the sun, moon, and stars. These calendars helped them figure out when to plant and harvest their crops. Over time different groups of people developed other calendars based on their own needs and beliefs.

Days, Weeks, Months, and Years

Several units of time are common to almost all calendars. The day is the most basic unit. The day measures the cycle of daytime and nighttime. It is now known to be the length of time that Earth takes to spin once on its axis. A group of seven days is called a week.

The month is about $29 \frac{1}{2}$ days long, the time taken by the Moon to orbit Earth. The year is about $365 \frac{1}{4}$ days long. That is the time taken by Earth to orbit the sun. The year measures the seasons.

Fitting months into years is a problem for calendar makers. The difficulty comes from the fact that the month is lunar, or based on the Moon, but the year is solar, or based on the sun. Twelve cycles of the Moon take about 354 days, not $365 \frac{1}{4}$. To make the lunar months fit into the solar year, it is necessary to add days at certain times. This is why calendar months differ in length. All except February are longer than 29 days to make up for the extra 11 days of the solar year. For the same reason a day is added to February every fourth year. These are called “leap years.”

Did You Know?

Unlike the day, the month, and the year, the week is not based on any astronomical event.

Early Calendars

The Sumerians of ancient Mesopotamia (now Iraq) used a calendar of 12 lunar months. They added an extra month about every four years. This calendar served as a model for early Greek and Jewish calendars.

The early Egyptians also used a calendar based on the Moon. Later, though, the Egyptians worked out a calendar that corresponded almost exactly to the seasons.

The early Romans had a lunar year of 355 days. To make the lunar year agree with the solar year, priests added extra months. The calendar became increasingly out of phase with the seasons.

Julian and Gregorian Calendars

In 46 BC, the Roman ruler Julius Caesar decided on the figure of 365 $\frac{1}{4}$ days for the length of the year. Every fourth year had 366 days. This calendar was named “Julian” after its creator. It had the 12 months at the lengths used today.

The Julian year was still slightly longer than the solar year, however, and problems arose as the centuries passed. In 1582 Pope Gregory XIII ordered 10 days to be dropped from the year. To keep the calendar correct in the future, Gregory ordered that leap year should be skipped three times in every 400 years. His system is called the Gregorian calendar. It is now used almost everywhere outside the Islamic world.

Native American Calendars

The Maya and the Aztec had the best Native American calendars. Their calendars each had a cycle of 260 named days related to their religious rituals and a year of 365 days. The year was divided into 18 months of 20 days each, with five days added to fill out the years.

Other Calendars

Several calendars other than the Gregorian calendar are still in use. The Muslim calendar, for example, is used by most Arab countries. It is a lunar calendar with 12 months of 30 or 29 days that add up to a year of 354 or 355 days.

The Chinese calendar is still used along with the Gregorian calendar in China, Taiwan, and neighboring countries. The traditional Hindu and Jewish calendars continue to be used as well for religious purposes.

► More to explore

Aztec • Caesar, Julius • Maya • Season

Did You Know?

Great Britain and its colonies lost 11 days when they switched from the Julian to the Gregorian calendar in 1752. The day after September 2 was September 14.



A Jewish calendar from the 1800s is written in Hebrew.

California

More people live in California than in any other U.S. state. About one eighth of the country's entire population lives in the state. California even has more residents than about half of the world's countries. The state's name is believed to have come from a Spanish novel of the 1500s that described a fabled place called California. The nickname of the Golden State comes from the golden poppies that grow in California and from the gold that was found there in the mid-1800s. Sacramento is the capital.

Geography

California is one of the country's largest states in area; only Alaska and Texas are bigger. It borders Nevada and Arizona on the east, Oregon on the north,

Mexico on the south, and the Pacific Ocean on the west.



California's landscape is varied, with mountains, valleys, forests, seacoasts, and deserts. The Klamath Mountains are in the state's northwest corner. To their east is the southern part of the Cascade Range. The Sierra Nevada is a wall of mountains in the east-central part of the state. The Central Valley runs north to south between the Sierra Nevada on the east and the highlands of the Pacific Coast Ranges. Most of eastern California is desert. The largest desert in the state, the Mojave, is in the southeast.

California's climate differs by location. The climate along the Pacific coast is generally mild. The Central Valley has hot summers and mild to cool winters. The mountains have short summers and cold winters. The southeastern desert is very hot and dry.

People

The majority of California's people are of European descent, but the state's minority groups are large. More than one fourth of California's residents were born outside the United States. Mexicans are the largest foreign-born group by far. People from the Philippines, China (including Hong Kong and Taiwan), Vietnam, and El Salvador are other large groups. Mexicans and other Hispanics make up about one third of California's population. African Ameri-





The scenic coastline of Big Sur stretches for 100 miles (160 kilometers) along the Pacific Ocean in California.

cans make up more than 6 percent. California's Native American population, numbering more than 330,000, is the largest in the country.

The largest clusters of people are in the south, around Los Angeles and San

Diego, and in the San Francisco Bay Area. Los Angeles is the largest city in the state and the second largest city in the country. Bay Area cities include San Francisco, Oakland, and San Jose.

Economy

California's economic production ranks first among the 50 states. If California were a country, it would have one of the world's largest economies. Services account for about three fourths of the state's economy. Service-related jobs include workers such as actors, social workers, government employees, schoolteachers, doctors and nurses, lawyers, and restaurant and hotel staff. Tourism is an important service industry. Each year it contributes about 75 billion dollars to the state's economy.



The Golden Gate Bridge connects San Francisco to Marin County. It is between San Francisco Bay and the Pacific Ocean.

California manufactures automobiles, aircraft, ships, military supplies, electrical equipment, and chemicals. California also has many food-processing plants and publishing and printing industries. A region known as Silicon Valley, in the San Francisco Bay Area, is home to much of the country's computer industry. The motion picture industry is centered in the Los Angeles area.

California's farms are the most productive in the country. The dozens of crops grown include grapes for eating and winemaking, citrus fruits, and nuts. Dairy farms produce milk, cheese, and other products.

History

Native Americans of the Shasta, Pomo, Miwok, and Chumash tribes lived along the Pacific coast of what is now California long before Europeans arrived. The Mojave lived in the southeast and the Yokut in the Central Valley.

Spaniards were the first Europeans in California. Juan Rodriguez Cabrillo claimed the land for Spain in 1542. In 1602 Sebastián Vizcaíno explored the coast and gave many places their present names. In 1769 two Spanish priests founded a mission called San Diego de Alcalá. During the next 50 years 20 more missions were established along the coast. Towns and large ranches grew around the missions.

Between the 1820s and the 1840s Mexico and the United States competed for California. Mexico owned the territory and refused to sell it to the United

States. In 1846 Californians around Sonoma, near San Francisco, rebelled against Mexican rule and joined the United States in fighting the Mexican War. The peace treaty that ended the war in 1848 gave California and other Mexican land to the United States.

Early in 1848, before the treaty was signed, gold had been discovered near Coloma, in northern California. This find started a gold rush. The arrival of tens of thousands of gold hunters called forty-niners (because many of them arrived in 1849) changed California. The population surge helped lead to statehood for California in 1850.

Many more people came to California after railroad service from the eastern United States began in 1869. During the Great Depression of the 1930s thousands of homeless farm families moved to the state hoping to earn a living. During World War II (1939–45) California's industries, such as aircraft plants and shipyards, greatly expanded. Many people moved to the state for work and stayed after the war.

In the early 21st century California continued to attract new residents, including many from Mexico. The state had to deal with issues such as creating affordable housing and educating people from many different backgrounds.

► More to explore

Gold Rush • Los Angeles • Mexican War
• Missions, Spanish • Sacramento
• Sierra Nevada

Facts About CALIFORNIA

Flag



Population

(2000 census)
33,871,648—
rank, 1st state;
(2008 estimate)
36,756,666—
rank, 1st state

Capital

Sacramento

Area

163,696 sq mi
(423,970 sq
km)—rank, 3rd
state

Statehood

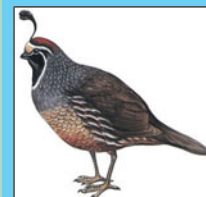
September 9,
1850

Motto

Eureka (I Have
Found It)

State bird

California quail



State flower

Golden poppy



Caliphate

The Caliphate was the name of the lands ruled by Muslims from AD 632 to 1258. The leaders of Islam after the prophet Muhammad had the title of caliph, which means “successor” in Arabic. The caliphs built an empire that stretched from India in the east to Spain in the west.

The First Caliphs

Islam began in the Arabian Peninsula in the early 600s. Muhammad, the founder of Islam, died in 632. Muslims then chose Abu Bakr to lead the Muslim community. He became the first caliph. He and the three caliphs who followed him—‘Umar I, ‘Uthman, and ‘Ali—were relatives of Muhammad.

Some Muslims rebelled against ‘Ali. This brought about a split in Islam that still exists today. The followers of ‘Ali became the Shi‘ite branch. The followers of Mu‘awiyah I, who was ‘Ali’s main opponent, became the Sunnites.

The Umayyad Caliphate

By 661, Mu‘awiyah had become the first of a line of caliphs called the Umayyads. Under their rule, Muslim armies took over North Africa and most of the Iberian Peninsula (now Spain and Portugal) in Europe.

Eventually, some Muslims rebelled against the Umayyads’ rule. Forces of the ‘Abbasid family defeated the last Umayyad caliph in battle in 750.

The ‘Abbasid Caliphate

The ‘Abbasid family started a new line of caliphs. The early ‘Abbasid caliphs supported trade, the arts, and the sciences. One caliph, called al-Ma’mun, tried to make peace with the Shi‘ites but failed.

The ‘Abbasids turned their attention away from the area around the Mediterranean Sea. Instead, they looked eastward and made Baghdad (in what is now Iraq) their capital. They also took on many soldiers from non-Arab peoples, particularly the Turks.



An Umayyad caliph is pictured on a gold coin from the 600s.

End of the Caliphate

The Buyids of Persia (now Iran) conquered the 'Abbasids in 945. The Seljuq Turks took over in 1055. The caliph became mainly a religious leader. Mongol raiders killed the last real 'Abbasid caliph in Baghdad in 1258. After that, people first in Egypt and then in the Ottoman Empire (centered in Turkey) claimed to be caliphs. However, most Muslims did not recognize their power.

► More to explore

Abu Bakr • Islam • Muhammad

Calligraphy

Calligraphy is the art of beautiful handwriting. Artists who create calligraphy are called calligraphers. They often use a special pen or a brush to make their art.

Calligraphy in Europe

Writing first developed more than 5,000 years ago. It was not until about the 500s BC, however, that some people began to use writing as a kind of decoration.

The Greeks were the first to use one kind of writing for everyday documents and another for more important texts. Later Europeans based their calligraphy on Greek and Roman styles.

Until about the 1400s few people knew how to write at all. Religious men called monks used calligraphy as they copied and decorated religious books. Students and professional copyists also knew how to write. Some used calligraphy while others used more simple forms.

By the 1400s many more people were learning how to write. In order to make writing a practical and easy skill, letters were simplified. At the same time the printing press was invented. This used simple letters that could be easily combined to print a page. Calligraphy lost importance until the late 1800s. Then it became a popular hobby.

Calligraphy in Other Cultures

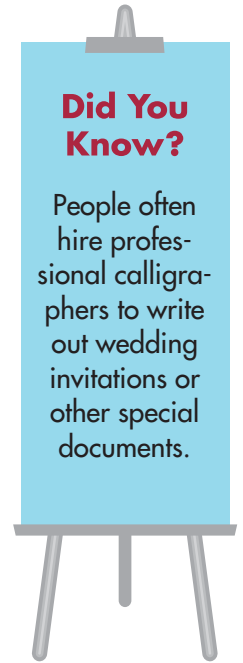
In China people consider calligraphy to be a high art form, like poetry or painting. Chinese calligraphers use brushes with ink on silk or paper. They do not change the look of the characters (the symbols of the Chinese language) by adding decorations.

Hebrew calligraphy is one of the oldest forms of writing. It has kept its basic style for hundreds of years. Copies of the Torah (the Jewish holy writings) are written by hand in Hebrew calligraphy.

Arabic calligraphy has been an important art form in the Islamic world since the 600s. Arabic letters are easily linked

Did You Know?

People often hire professional calligraphers to write out wedding invitations or other special documents.



Calligraphy is an important art in Japan. Many Japanese schoolchildren enter calligraphy contests.

for an artistic look. Mosques (Islamic places of worship) often contain examples of Arabic calligraphy.

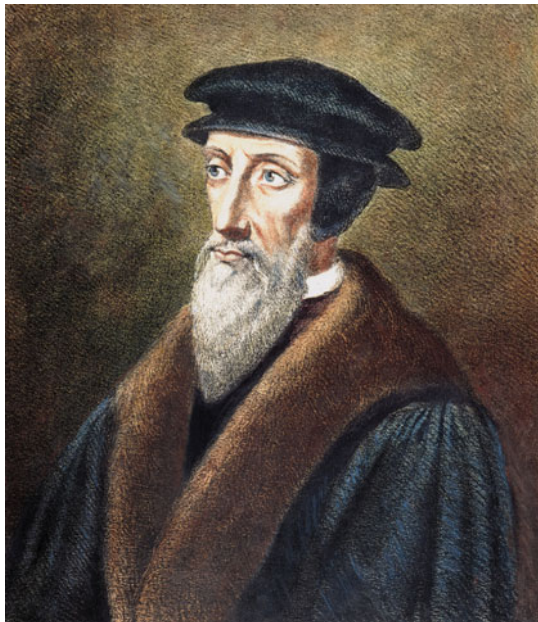
► **More to explore**

Arts • Monk • Printing • Writing

Calvin, John

The French religious thinker John Calvin was one of the leaders of the Reformation. Calvin and others wanted to change, or reform, the Roman Catholic church. Instead the Reformation led to the creation of a new branch of Christianity called Protestantism. This became one of the three major branches of Christianity.

Calvin was born on July 10, 1509, in Noyon, France. He studied religion and law during the 1520s. He also became involved in the movement to reform Roman Catholicism. The Catholic



John Calvin was one of the first leaders of the branch of Christianity called Protestantism. He stressed faith in God above all else.

church encouraged people to do good works and to perform rituals in order to get to heaven. But the reformers thought that God alone decided who went to heaven, and not because of their actions.

In 1533 Calvin moved to Switzerland, where he studied religious ideas, especially those of a German priest named Martin Luther. Like Luther, Calvin began to reject Roman Catholicism. Calvin began writing down his new Protestant beliefs. He published these beliefs in a book, which inspired many people to become Protestants.

Calvin became well known and moved to Geneva (now in Switzerland). He worked with other leaders to make this city-state into an important center of Protestantism. Calvin also eventually convinced Geneva's leaders to follow his ideas about government. He thought that governments should make laws based on religious beliefs.

Calvin died in Geneva on May 27, 1564. After his death his followers, called Calvinists, spread his ideas across Europe. In the 1600s some English Calvinists brought Calvinism to North America. Today many people view Calvin as the founding father of several Protestant churches, including the Reformed and Presbyterian churches.

► **More to explore**

Luther, Martin • Protestantism
• Reformation • Roman Catholicism

Cambodia



The Royal Palace in Phnom Penh, Cambodia, is built in the traditional Cambodian style.

The Southeast Asian country of Cambodia has long served as a battleground between various countries and political groups. The capital is Phnom Penh.

Geography

Cambodia is bordered by Laos, Thailand, and Vietnam. The Gulf of Thailand lies to the southwest. A low-lying plain covers central Cambodia. In the east the Mekong River runs through highlands. The Tonle Sap (Great Lake) and mountains lie in the west. Cambodia has a tropical climate with a rainy season and a dry season. In the lowlands temperatures rarely drop below 80° F (27° C).

Plants and Animals

Dense forests cover two thirds of Cambodia. Tall evergreen trees, bamboo,

vines, and palms grow in the northern mountains. The southwestern highlands contain pine forests in the higher regions and rain forests near the sea. Rice paddies, fields of crops, and grasslands cover the central plain.

Cambodia's northern forests contain elephants, wild oxen, rhinoceroses, tigers, and leopards. The birds native to Cambodia include herons, pelicans, cormorants, and pheasant. The country also has crocodiles and cobras.

People

The Khmer ethnic group makes up about 85 percent of the population. Chinese, Vietnamese, and Cham people also live in Cambodia. Buddhism is the main religion. Many rural people also follow ancient folk religions. More than 80 percent of the population lives in rural areas.





A woman in Cambodia works in a rice paddy. A paddy is a type of wet farmland.

Facts About CAMBODIA



Population
(2008 estimate)
14,242,000

Area
69,898 sq mi
(181,035 sq km)

Capital
Phnom Penh

Form of government
Constitutional monarchy

Major urban areas
Phnom Penh, Bat Dambang, Siso-phon, Siem Reab, Preah Sihanouk

Economy

About 70 percent of Cambodians are farmers. The main crop is rice. Other crops include cassava, corn, sugarcane, bananas, coconuts, oranges, rubber, soybeans, and tobacco. Cambodians also fish and raise livestock, including cattle, pigs, and buffalo.

Trade and manufacturing are important parts of the economy. Cambodia's main products are clothing and textiles, leather, foods, rubber goods, and logs.

History

People have lived in what is now Cambodia for at least 6,000 years. The most famous of Cambodia's ancient kingdoms was the powerful Khmer Empire. The Khmer ruled much of Southeast Asia from the AD 800s to the 1200s. They constructed the famous temples of Angkor Wat in the 1100s. In the 1300s and 1400s the neighboring Tai peoples invaded, and Cambodia lost

much of its territory. In the 1800s Thailand and Vietnam further divided the country.

In the late 1800s France took control of the region. The French merged Cambodia with Vietnam and Laos to create the colony of French Indochina. France granted Cambodia its independence in 1953.

During the 1960s and 1970s the Vietnam War spilled over into Cambodia. In 1975 a group of Communists known as the Khmer Rouge seized control of the country. Led by a man named Pol Pot, the Khmer Rouge killed anyone who opposed the new government. At least 1 million Cambodians died in what came to be known as the "Killing Fields."

In 1978 Communist forces backed by Vietnam invaded Cambodia and toppled the Khmer Rouge government. They set up a new government and changed the name of the country to Kampuchea. Khmer Rouge rebels continued to fight the government.

Vietnam pulled out of the country (once again known as Cambodia) in 1989. In 1993 a new Cambodian government banned the Khmer Rouge. However, the rebels did not stop fighting until Pol Pot died in 1998. Although the civil war was over, political quarrels and violence continued.

► More to explore

Angkor Wat • Mekong River • Phnom Penh • Vietnam War

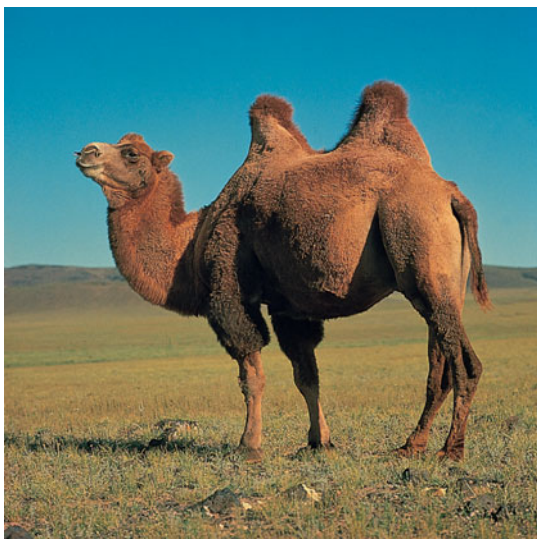
Camel

Camels are large mammals that live and work in several of the world's deserts. They are known for their humps. The Arabian camel, or dromedary, has one hump on its back. The Bactrian, or Asian, camel has two humps. Camels belong to the same family as the llama and the alpaca.

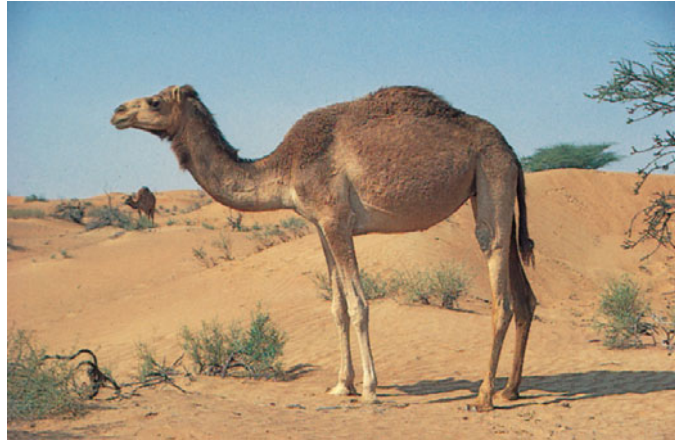
Where Camels Live

The Bactrian camel lives in the highlands of central Asia. Most Bactrian camels are domesticated, or tamed to help humans. Small herds of wild Bactrians live in Mongolia and northwestern China.

The Arabian camel lives mainly in North Africa, the Middle East, and India. There are no wild Arabian camels left in these places. However, herds of wild Arabian camels now live in Australia. They are the descendants of tame



The Bactrian camel is also called the Asian camel. It has two humps.



The Arabian camel is also known as a dromedary. It has only one hump.

camels that people brought to Australia in the 1800s.

Physical Features

Camels weigh up to about 1,400 pounds (650 kilograms). They are about 7 feet (2 meters) tall at the hump. The hump is made of fat and muscle. Camels have a long neck, a small head, and a split upper lip. Long eyelashes protect the eyes from sandstorms and glaring sun. The nostrils can close to keep out blowing sand. Camels stand on four long legs. Each foot has two hoofed toes. A scruffy, sand-colored coat of hair covers the body.

Behavior

Camels are well adapted to living in deserts. They feed on thorny plants, shrubs, and dried grasses. They can go for days or even months without water. If a camel goes without food and water, the fat in its hump can nourish it for several days. The hump then becomes limp and leans to one side or disappears altogether.

Did You Know?

The first camels lived in North America about 40 million years ago. They died out in North America after spreading to other continents.

Uses

Desert peoples ride on camels and use them to carry loads. Camels can carry up to 1,000 pounds (450 kilograms). Desert peoples also drink camel milk and eat camel meat. They make tents, blankets, rugs, clothing, and rope out of camel hair. Dried camel droppings are useful as fuel for cooking fires.

► More to explore

Desert • Llama • Mammal

Camera

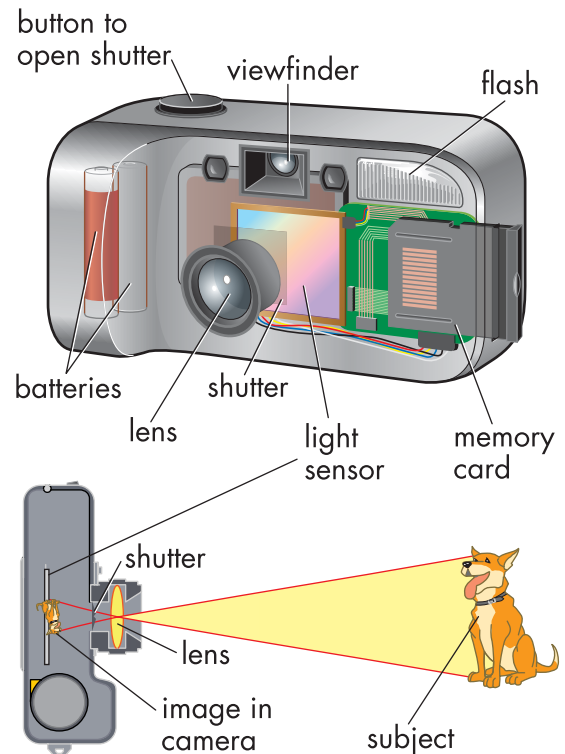
A camera is an instrument used to take, or record, pictures of people and objects. Some cameras record single, still pictures called photographs. Movie cameras and video cameras record moving pictures. These are called movies, films, or videos.

The word camera comes from the Latin words *camera obscura*, which mean “dark chamber.” This is because the earliest experiments with capturing images took place in a darkened chamber, or room.

How a Camera Works**Traditional Cameras**

A traditional camera is a lightproof box. The box contains an aperture, or opening, that lets light in for a certain amount of time. A part called a shutter opens and closes the aperture. This controls the amount of light coming into the camera.

Light from an object, or subject, passes into the camera through one or more lenses. The lenses focus the light onto



The lens in a digital camera focuses light from an object, or subject, onto a light sensor inside the camera. The sensor turns the light into electric signals that represent the image.

film stored in the camera. The chemically coated film reacts to the light and records an image, or picture, of the object. Photographers then remove the film from the camera. With special chemicals, they use the film to make prints of the image on paper.

There are many types of traditional cameras. Some are fully automatic. This means that the camera focuses and allows in the right amount of light to take a good picture. The photographer needs only to aim the camera and press a button. Other cameras allow the photographer to make these adjustments by hand. They give the photographer more control over the way the pictures look.

Digital Cameras

A digital camera works in a similar way as a traditional camera. However, it captures the image on an electronic chip rather than on film. The chip is a light sensor that turns the image into electric signals. Most digital cameras have a small screen that displays the image right away. The camera can also store the image on a memory card. Photographers can transfer the stored image to a computer. This allows them to view, e-mail, or print out the image.

Movie and Video Cameras

Movie cameras are like traditional cameras, but they record moving images. They do this by taking many still pictures in a row—usually 24 or 30 each second. They record images on a reel of film. When a movie projector shows the pictures on the film one after the other, the images appear to be moving. Video cameras, or camcorders, record moving images on magnetic tape. Digital camcorders store moving images as electric signals.

History

In ancient times people used a camera obscura to view eclipses of the sun. They stood in a small, dark room that had only a tiny hole to let in light. An upside-down image of the scene outside appeared on the wall across from the hole. Later, people made portable boxes that worked like the ancient camera obscura. A mirror reflected the image outside the box and onto a screen.

In 1837 a Frenchman, Louis Daguerre, found a way to record the images made by a camera obscura on metal plates. These pictures were called daguerreotypes. Around the same time an Englishman named William Henry Fox Talbot used a similar box to record images on paper. These men had created the first modern cameras.

In the late 1800s the U.S. inventor George Eastman made a camera that brought photography to the general public. Before this time cameras were heavy, complicated, and expensive. Eastman's camera was small and easy to use. People simply pushed a button to take pictures and then sent the film to Eastman's factory to be printed.

The U.S. inventor Thomas Edison and the French Lumière brothers developed movie cameras in the late 1800s. Digital cameras did not appear until the 1990s.

► More to explore

Edison, Thomas • Lens • Light • Movie
• Photography



Digital cameras are easy to use and film free. They are especially handy for taking snapshots.



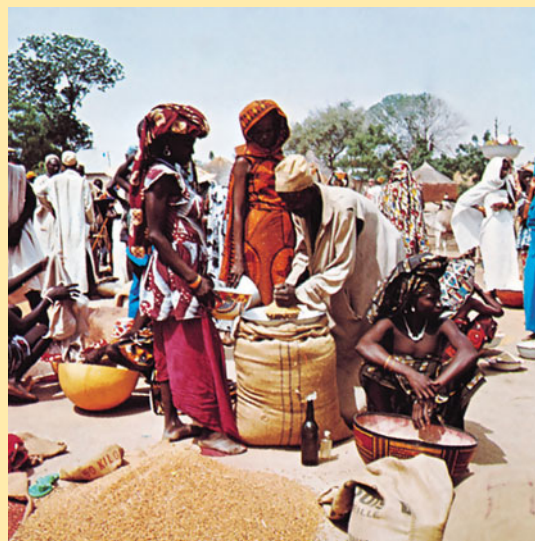
Cameroon

The West African country of Cameroon takes its name from the Rio dos Camarões (River of Shrimps), the name the Portuguese gave to the Wouri River. The capital is Yaoundé.

Cameroon is bordered by Nigeria, Chad, the Central African Republic, Republic of the Congo, Gabon, and Equatorial Guinea. The Atlantic Ocean lies to the west. Mountains run through the north and west. The country has hot temperatures year-round.

Rain forests are in the south. Mangroves grow along the coasts and rivers. Monkeys live in the forests. Elephants, baboons, and antelope live in the wooded grasslands of the north.

The ethnic groups of Cameroon include the Fang, the Bamileke, the Duala, and the Fulani. English and French are the official languages, but people speak many other languages. The majority of the



People gather to buy and sell goods at a market in Maroua, Cameroon.

people follow Christianity or traditional religions. The north is mostly Muslim.

Cameroon's economy is based on farming. The main crops include cassava, sugarcane, corn, bananas, and sorghum. The country also produces petroleum (oil), lumber, and cocoa for export.

Humans have lived in what is now Cameroon for at least 50,000 years. Eventually Bantu people settled in the south and the west, and the Fulani settled in the north. In the 1470s the Portuguese established sugar plantations and a slave trade. Germany gained control in the late 1800s. After World War I Cameroon was divided into French and British zones. In 1960 the French zone became the independent republic of Cameroon.

► **More to explore**
Yaoundé

Facts About CAMEROON



Population
(2008 estimate)
18,468,000

Area
183,569 sq mi
(475,442 sq km)

Capital
Yaoundé

Form of government
Republic

Major cities
Douala, Yaoundé,
Garoua, Maroua,
Bafoussam



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Canada



Banff National Park is in southwestern Alberta, along the Canadian Rocky Mountains.

Canada is the largest country in the world after Russia. The country is divided into 10 provinces and three territories. The capital is Ottawa.

Geography

Canada lies north of the United States in North America. The U.S. state of Alaska sits on its northwestern border. The Pacific, Atlantic, and Arctic oceans form the rest of its borders.

Canada's largest natural region is a rocky, mostly flat area that covers the eastern, central, and northwestern parts of the country. In the west, plains stretch from the Arctic Ocean to the U.S. border. The Mackenzie, Canada's longest river, drains the northwest. West of the plains are the Canadian Rocky Mountains. Along the Pacific are the Coast Mountains. In the south and southeast,

lowlands border the Great Lakes and Saint Lawrence River.

Because of its size, Canada has great variety in its climate. Most regions have very cold and long winters. Temperatures are most moderate along the Pacific coast.

Plants and Animals

One of the largest evergreen forests in the world stretches from Alaska to Canada's Atlantic coast. In the south, the evergreens are mixed with maple, beech, red oak, and white ash trees. In the far north is cold land known as tundra, where only mosses, lichens, and low shrubs grow.

Many of Canada's wild animals live in the northern forest. Among them are moose, beavers, Canada lynx, black bears, wolves, and snowshoe hares. Seals, polar bears, caribou, white foxes, and snowy owls live in the tundra. The animals of the plains include deer and antelope. Fish are plentiful in Canada's waters.

People

Nearly half of the people in Canada have British ancestors, and almost one fourth have French ancestors. Smaller groups of people descended from other European, Asian, or U.S. immigrants. There are also small groups of American Indians and Inuit, as well as Métis (people with both Indian and European

Facts About CANADA



Population
(2008 estimate)
33,213,000

Area
3,855,103 sq mi
(9,984,670 sq km)

Capital
Ottawa

Form of government
Federal parliamentary state

Major metropolitan areas
Toronto, Montreal, Vancouver, Ottawa-Hull, Calgary, Edmonton



ancestors). Both English and French are official languages.

About three fourths of Canadians are Christians. About one sixth of Canadians follow no religion. The country also has small groups of Muslims, Jews, Hindus, and people of other faiths.

Most people live in cities and towns in the south. The largest city is Toronto, Ontario, Canada's business center. The second largest city is Montreal, Quebec. It is a major seaport and one of the biggest French-speaking cities in the world. Vancouver, British Columbia, is Canada's third largest city.

Economy

The economy of Canada is based on manufacturing and businesses that serve the public. Among the many service industries are finance, health care, education, and tourism. The most valuable manufactured goods include chemicals, electronic products, metals, and wood and paper goods. Canada is also a leading producer of petroleum (oil), natural gas, and minerals.

Canada is one of the world's top food producers. It is known for its grains, especially wheat, and oilseeds. Pigs and cattle are the most important livestock. Fishers catch salmon, herring, cod, and other fish in Canada's waterways.



People eat outside at a restaurant in Montreal, in the Canadian province of Quebec.

History

Early Peoples and Exploration

For thousands of years, Inuit lived in the north and American Indian peoples lived in the south of what is now Canada. Vikings from northern Europe arrived in what is now Newfoundland in about 1000 AD. The Vikings did not stay in Canada, however.

In 1497 the Italian explorer John Cabot landed in eastern Canada. Others soon

followed. In 1534 a French explorer, Jacques Cartier, entered the Gulf of Saint Lawrence in what is now Quebec. He claimed the area for France.

New France

In 1608 Samuel de Champlain founded the city of Quebec, France's first permanent Canadian colony. The French soon set up more settlements in the region, which they called New France.

Meanwhile, the British also became interested in the region. In 1670 the English started Hudson's Bay Company, which built trading posts around Hudson Bay. Over the next century Great Britain and France fought wars over the land. After defeating France in the French and Indian War in 1763, Britain took control of Canada. They made New France into the colony of Quebec.

British North America

By the late 1700s Britain ruled the lands that would become the provinces of



TIMELINE

Vikings arrive in what is now Newfoundland.

about 1000

John Cabot explores the eastern coast of Canada.

1497

Samuel de Champlain founds a French colony in Nova Scotia.

1605

Great Britain gains control of New France.

1763

New Brunswick, Nova Scotia, Ontario, and Quebec form the Dominion of Canada.

1867

Canada gains full independence from Great Britain.

1982

Nunavut becomes Canada's third territory.

1999

Prime Ministers of Canada

Name	Political Party	Term
John Macdonald	Liberal-Conservative	1867–73
Alexander Mackenzie	Liberal	1873–78
John Macdonald	Conservative	1878–91
John Abbott	Conservative	1891–92
John Thompson	Conservative	1892–94
Mackenzie Bowell	Conservative	1894–96
Charles Tupper	Conservative	1896
Wilfrid Laurier	Liberal	1896–1911
Robert Borden	Conservative	1911–20
Arthur Meighen	Conservative	1920–21
Mackenzie King	Liberal	1921–26
Arthur Meighen	Conservative	1926
Mackenzie King	Liberal	1926–30
Richard Bennett	Conservative	1930–35
Mackenzie King	Liberal	1935–48
Louis Saint Laurent	Liberal	1948–57
John Diefenbaker	Progressive Conservative	1957–63
Lester Pearson	Liberal	1963–68
Pierre Trudeau	Liberal	1968–79
Joseph Clark	Progressive Conservative	1979–80
Pierre Trudeau	Liberal	1980–84
John Turner	Liberal	1984
Brian Mulroney	Progressive Conservative	1984–93
Kim Campbell	Progressive Conservative	1993
Jean Chrétien	Liberal	1993–2003
Paul Martin	Liberal	2003–06
Stephen Harper	Conservative	2006–

Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, and Quebec. Britain divided Quebec into Upper and Lower Canada in 1791.

In the mid-1800s people began to call for a union of these colonies. In 1867 Nova Scotia, New Brunswick, and Upper and Lower Canada (now the provinces of Ontario and Quebec) formed the Dominion of Canada. Canada now had its own federal government, although Britain kept some control.

Westward Expansion

The population of Canada increased quickly during the 1800s. As settlers moved westward, new provinces and territories were created. Many native peoples lost their land and moved to reserves.

The provinces of Prince Edward Island, Manitoba, Saskatchewan, Alberta, and British Columbia, as well as Yukon and the Northwest Territories, joined the country by the 1930s. The province of Newfoundland joined Canada in 1949.

Independence

In 1982 the British Parliament granted Canada control over its constitution. This made Canada an independent country though it kept ties to Britain.

Beginning in the 1960s many French Canadians in Quebec called for separation from Canada. They wanted to create a French-speaking nation. In 1995 the people of Quebec narrowly voted against separating from Canada. Some French Canadians continued to call for separation, however.

In the 1990s many native people asked the Canadian government to return their land to them. Canada responded by creating Nunavut, a self-governing homeland for the Inuit, in 1999. The new territory was formed from the eastern part of the Northwest Territories.

► More to explore

Cabot, John • Cartier, Jacques
 • Champlain, Samuel de • Eskimo
 • Great Lakes • Hudson Bay • Ottawa

Canada Day

Canada Day is the national holiday of Canada. It is celebrated on July 1. On that day in 1867 Canada became a country.

In 1867 four of Great Britain's North American colonies joined together as a new country. It was called the Dominion of Canada. In 1879 a law made July 1 a holiday called Dominion Day. Canada gained complete independence from Great Britain in 1982. In the same year Canada changed the holiday's name to Canada Day.

Canadians celebrate Canada Day with parades, barbecues, picnics, and displays of fireworks. They also sing the national anthem, "O Canada." The most important celebration takes place in the area of Parliament Hill, in Canada's capital city of Ottawa. Members of Canada's national police force, the Royal Canadian Mounted Police, do horse riding

tricks. Part of the Royal Canadian Air Force puts on an air show.

► More to explore

Canada • Ottawa

Canal

Canals are waterways that are built by people and used for shipping, travel, and irrigation. Canals have been an important way to move goods and carry people for more than 5,000 years.

Some canals make it possible for boats to travel inland from oceans and lakes. A canal may also serve as a shortcut between two bodies of water. Other canals carry drinking water to cities or irrigation water to farms.

Building a Canal

To make a canal, builders dig a long channel in the ground and fill it with water. The water usually comes from a connecting river, lake, or ocean. Builders often line the canal with stone, concrete, or steel to make it stronger. The lining also prevents the water from leaking out.

Locks

Locks are an important part of many canals, especially in areas where the land is not completely flat. A lock is a stretch of canal blocked off at each end by strong gates. These gates can be opened or closed to allow water to fill or to drain from the lock.

Locks allow boats to travel between lower and higher areas of a canal. When

Did You Know?

The Saint Lawrence Seaway in North America includes several canals. They were built to open the Great Lakes to oceangoing ships.



Three young people celebrate Canada Day, the national holiday of Canada.

a boat enters a lock, the gates close behind it. Water then fills or empties from the lock through small openings called sluice gates. When the water in the lock reaches the level of the next part of the canal, the gates in front of the boat open. The boat then passes out of the lock.

Famous Canals

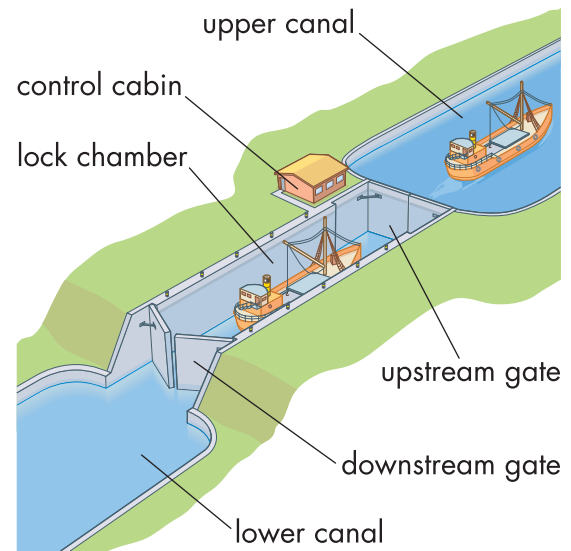
The world's oldest canal still being used today is the Grand Canal in China. It is also the world's longest canal, with a length of about 1,085 miles (1,747 kilometers).

The Erie Canal connects the Hudson River in New York with the eastern shore of Lake Erie, near Buffalo, New York. The Erie Canal was an important shipping route in the 1800s.

The Suez Canal in Egypt connects the Mediterranean Sea with the Red Sea. This major shipping canal is the shortest water route between Europe and the Indian Ocean.



In Venice, Italy, people travel on canals instead of roads.



Locks allow boats to travel between lower and higher areas of a canal.

The Panama Canal is an important shortcut between the Atlantic and Pacific oceans. Before this canal was built, ships had to travel around the tip of South America to get from one ocean to another.

In Venice, Italy, people use canals as roadways. In the oldest parts of the city, people travel by special boats called gondolas instead of cars. A gondola is pushed with a long pole.

► More to explore

Erie Canal • Irrigation • Panama Canal
• Suez Canal

Canary

The canary is a small bird known for its singing. Canaries are found wild in the Canary, Azores, and Madeira islands off the coast of northwestern Africa. Hundreds of years ago people caught these wild birds and began breeding them.



The canary is one of the most popular pet songbirds in the world.

Over time they have bred hundreds of different kinds of canaries that are sold as pets.

Several other small songbirds, such as the American goldfinch, are sometimes called wild canaries. But they are different types of birds. The canary is a species, or type, of songbird that is closely related to goldfinches, siskins, and redpolls. It is also related to other finches, cardinals, and sparrows.

In the wild, canaries measure about 5.5 inches (14 centimeters) in length. They are dull greenish brown with yellowish breasts. Pet canaries differ in size, form, feather color, and song. Breeders work to develop different characteristics in the different kinds of pet canaries. Many pet canaries have bright yellow feathers.

Canaries have short, cone-shaped bills. They use their bills to crack open seeds to get at the parts that are good to eat. They may also eat fruits.

► More to explore

Cardinal • Pet • Songbird • Sparrow

Canberra



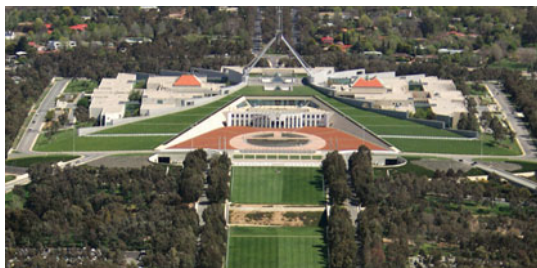
Population
(2006
estimate), urban
area, 328,441

Canberra is the capital of the country of Australia. The city is also the center of a district called the Australian Capital Territory. Canberra lies at the foot of the Australian Alps mountain range. The Molonglo River flows through the city. Many people in Canberra work for the Australian government or in tourism.

Native Australians, called Aborigines, have lived in the Canberra region for thousands of years. Europeans founded a settlement there in the 1820s. The government selected Canberra to be the new capital of Australia in 1908. A competition was held to choose the design for the new city. The American architect Walter Burley Griffin created the winning design. Canberra officially became the capital in 1927. Wildfires damaged the city in 2003.

► More to explore

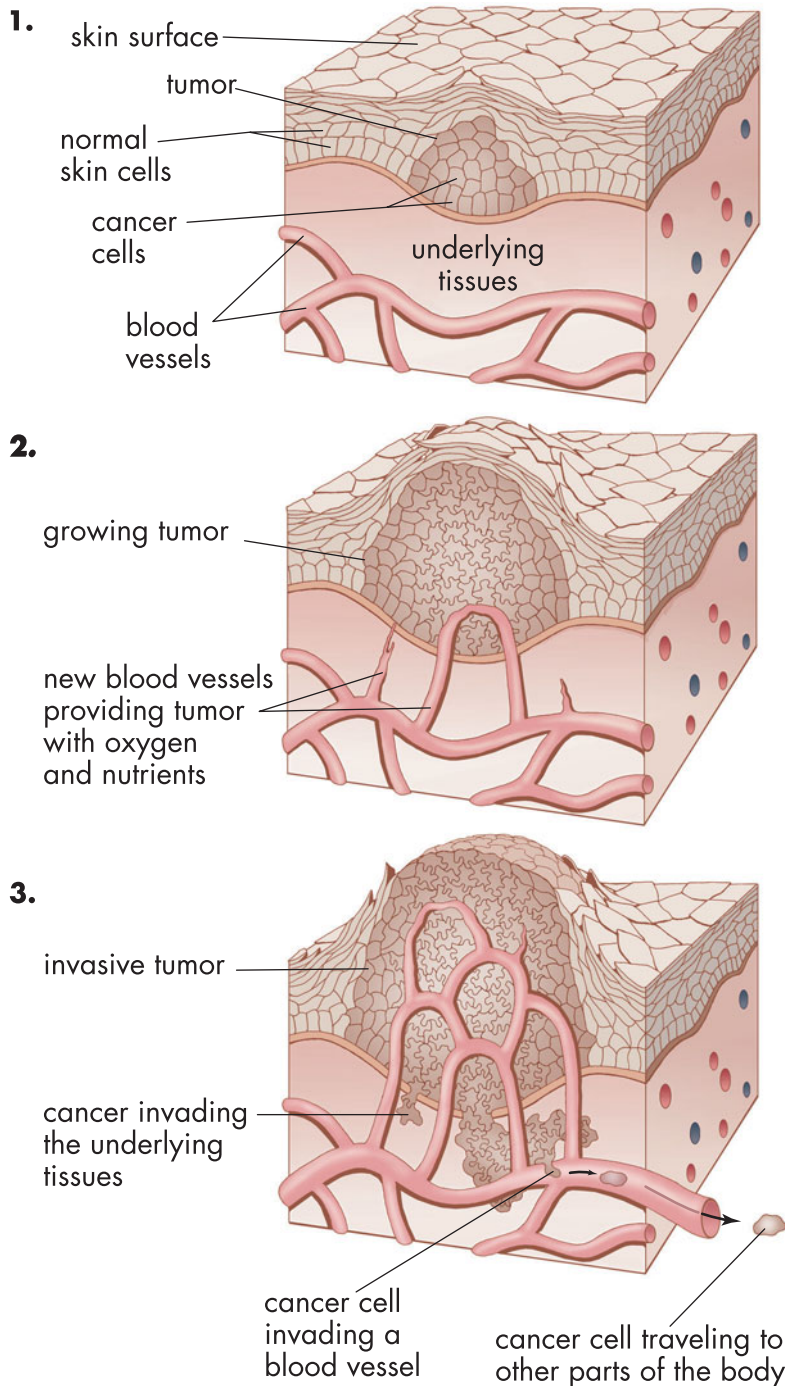
Australia



The Australian Parliament House is built into a hill.

Cancer

Cancer is a disease that causes certain cells in the body to grow out of control. The human body contains billions of



As a tumor grows larger, it invades the healthy tissues nearby. Cancer spreads when cells from a tumor travel to other parts of the body.

cells. Most of these cells reproduce, or duplicate themselves, over and over. The body normally controls this process. In some people, however, certain cells start to multiply too much. These cells are not normal. They produce clumps of tissue called tumors.

Some tumors are harmless, but others are very serious. They can destroy nearby healthy cells and organs. These destructive tumors are called cancer. Cells from these tumors sometimes spread to other parts of the body and form more tumors.

There are many different kinds of cancer. The kind of cancer a person has depends on where it starts to grow. It also depends on what causes it and how fast it grows.

Symptoms

There are some general symptoms, or signs, that may mean a person has cancer. These symptoms include pain, weight loss that cannot be explained, fever, tiredness, and changes in the skin. Each kind of cancer also produces specific symptoms. For example, a cough that will not go away could be a sign of lung cancer.

Causes

Scientists do not know why some cells multiply too quickly. However, they have discovered many things that can lead to cancer. Most cancers are caused by conditions outside the body. For example, getting too much sunlight can cause skin cancer. Smoking tobacco can cause lung or mouth cancer.

In addition, eating unhealthy foods and not exercising enough can lead to cancer. People have a higher chance of getting some kinds of cancer if members of their families had them. A few viruses also cause cancer.

Prevention

The easiest way to prevent cancer is to stay away from the things that might cause it. For example, doctors suggest that people wear sunscreen lotion when outdoors. Sunscreen lotion protects the skin from harmful rays in sunlight. Exercise and eating a lot of fruits, vegetables, and whole grains also can help to prevent cancer. Seeing a doctor once a year helps, too. Doctors can find early warning signs of cancer.

Treatment

If cancer is caught early, it often can be treated successfully. A doctor can remove tumors by surgery, or cutting them out of the body. Radiation (energy particles) and chemotherapy (chemicals) are also used in cancer treatment. These two processes either kill the cancer cells or stop them from growing.

► More to explore

Cell • Disease, Human

Canyon

A canyon is a narrow, deep valley cut by a river through rock. Canyons vary in size. Some are narrow slits while others are huge trenches. Canyons have very steep sides and may be thousands



Over many years, Deer Creek has cut through rock to create a beautiful canyon in Grand Canyon National Park, Arizona.

of feet deep. Smaller valleys of similar appearance are called gorges.

Canyons are created by erosion. Over thousands or millions of years a river's flowing water erodes, or wears away, soil and rocks to form a valley. The largest and most famous canyons have been cut through dry areas by swift streams fed by rain or melting snow from wetter areas. The walls remain steep and rough because there is little rainfall or surface water to wear them down. An example is the Grand Canyon, in the U.S. state of Arizona.

Submarine canyons are deep underwater valleys. They are found along the borders of the continents and some ocean islands. The Grand Bahama Canyon, in the Atlantic Ocean near the Bahamas, is thought to be the deepest submarine



Plants grow on the walls and floor of a canyon in Iceland. Many famous canyons are found in dry regions, but canyons also may form in cool, wet areas.

canyon. Its walls are nearly 3 miles (5 kilometers) tall.

► More to explore

Continent • Erosion • Grand Canyon
• River

Cape Town



Population
(2005 estimate)
3,103,000

The country of South Africa has three capitals—Cape Town, Pretoria (Tshwane), and Bloemfontein. Cape Town is where the country's legislature meets.

The legislature makes the country's laws. It is a large city in a beautiful natural setting.

Cape Town is one of South Africa's most important centers of industry. Factories in the city process foods and make wine, clothing, and leather goods. Other main industries include ship repair and tourism. Cape Town is also a seaport.

The first people to live in the region were ancestors of the African Khoisan people. Traders from the Netherlands founded a settlement at the site in 1652. It was the first European settlement in what is now South Africa. The company used the settlement as a supply station. In 1806 the British took control of the area. In the late 1800s the discovery of gold and diamonds nearby brought many more people to Cape Town. In 1910 the country of South Africa was formed with Cape Town as its legislative capital.

► More to explore

Bloemfontein • Pretoria • South Africa



The city of Cape Town, South Africa, looks out onto the Atlantic Ocean.

Cape Verde



The town of Porto Novo, Cape Verde, is tucked into the mountains.

Cape Verde is an archipelago, or group of islands, in the Atlantic Ocean. Ruled by Portugal for 500 years, the country gained independence in 1975. Praia, on São Tiago Island, is Cape Verde's capital and largest city.

Cape Verde lies 385 miles (620 kilometers) west of Africa. It includes 10 islands and five rocky islets. The Windward, or Barlavento, Islands lie to the north of the Leeward, or Sotavento,



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Islands. The islands are mountainous. The climate is warm and very dry.

Grasses and some pine trees grow on mountain slopes that face the wind, where there is more rainfall. The sheltered slopes are desertlike, with thorny shrubs. Many lizards, butterflies, and birds live on the islands. Sea turtles lay their eggs on the sandy shores. The long-eared bat is the only mammal native to Cape Verde.

More than two thirds of Cape Verde's population is Creole, or of mixed African and European roots. Most of the rest of the people are African. The official language is Portuguese, but most people speak a form called Crioulo. Most Cape Verdeans are Roman Catholics. Most live in towns or cities.

Trade and transportation bring the most money to Cape Verde's economy. Agriculture and manufacturing play smaller roles. Crops include corn, sugarcane, bananas, coconuts, and sweet potatoes.

No one lived in Cape Verde until Portuguese settlers landed on São Tiago in 1462. They used the islands in their African slave trade. In 1951 Portugal made Cape Verde a province. All the people of the islands gained Portuguese citizenship in 1961. In 1975 Cape Verde became an independent republic.

► **More to explore**
Praia



Facts About CAPE VERDE



Population
(2008 estimate)
500,000

Area
1,557 sq mi
(4,033 sq km)

Capital
Praia

Form of government
Republic

Major cities
Praia, Mindelo,
São Filipe

Capitalism

Capitalism is an economic system. That is, it is a system for dealing with money and wealth. In a capitalist country, citizens, not governments, own and run companies. These companies compete with other companies for business. They decide which goods and services to provide. They also decide how much to charge for the goods and services and where to sell them. Companies do all these things to make money for their owners. People who use their money to start or to run companies are called capitalists.

Many countries of the world—including the United States, Great Britain, Japan, and Germany—practice capitalism. Other names for capitalism are free-market economy and free enterprise.

Rise of Capitalism

Capitalism has existed since ancient times—for as long as people have bought and sold goods. However, it



In a capitalist economy, many different companies compete against one another for business. For example, many different companies make televisions for people to buy.

gained importance in the 1500s with the growth of trade, industry, and banking. During this time governments tried to encourage trade. To do this, countries behaved like merchants. They tried to sell more to foreign countries than they bought from those countries. This idea of profit (taking in more money than one pays out) helped modern capitalism to develop.

“Laissez-Faire” Capitalism

In the 1700s and 1800s, the Industrial Revolution brought great changes to the economies of many countries. Factories were invented, and soon manufacturing grew greatly. Manufacturers did not want governments to control trade anymore. They wanted to be left alone to run their companies. This idea became known as “laissez-faire,” which means “allow to do” in French.

Reactions to Capitalism

During the 1800s and early 1900s companies produced more and more goods, and many capitalists became rich. However, ordinary workers earned low wages while working long hours, sometimes in dangerous conditions. These problems led to the growth of labor movements. Many workers banded together to demand better treatment from companies.

The ideas of socialism also became popular. Under socialism, a government controls the economy by owning companies and property. It then tries to spread its country’s wealth fairly among its citizens. Many countries followed some socialist ideas in the 1900s. Some

countries, including the Soviet Union, adopted an extreme form of socialism called Communism.

Capitalism Today

Laissez-faire capitalism mostly ended during the 1930s. People throughout the world suffered economic problems during a period called the Great Depression. Many people—not just socialists—came to believe that governments had to help control the economy. Most governments now pass laws to make companies treat customers and workers fairly.

Capitalism remains the world's most popular economic system. Many countries today even mix capitalism with socialism. In these countries, the government owns some companies and provides many services, but individuals may own companies, too.

► More to explore

Bank and Banking • Economics
• Industry • Labor • Socialism • Trade

Capital Punishment

Of all punishments for convicted criminals, capital punishment is the most severe. Because it means putting the criminal to death, it is often called the death penalty. In the 20th century many nations abolished capital punishment. However, some countries and most states of the United States continue to use it.



A group of people in California attend a protest against capital punishment.

Conflicting Views

People who support capital punishment say that justice is done when a person who has committed murder is executed. They also say that fear of death will make people less likely to commit murder.

People who oppose capital punishment say that it is not civilized. They doubt whether it prevents crime, and they point out that innocent people have been wrongly executed. They also argue that capital punishment is applied unevenly. Most people who are executed are poor or members of minority groups who do not have access to good lawyers.

History

Capital punishment goes back to ancient times. In ancient Greece and Rome people were put to death for many different crimes. It has been limited over time, though in some countries it is still used for a variety of offenses. In the United States in 2002

the U.S. Supreme Court ruled against executing anyone who is mentally impaired. Three years later the Court banned execution for people who were less than 18 years old when they committed their crimes.

► More to explore

Crime

Car

► see Automobile.

Caracas



Population
(2001 estimate), city, 1,836,000; (2005 estimate), urban area, 2,913,000

Caracas is the capital of Venezuela, a country in northern South America. The city is in a valley surrounded by mountains. The port of Caracas lies on the Caribbean Sea, about 20 miles (32 kilometers) away from the city. Caracas is the largest city in Venezuela by far. It is the country's center of culture, education, business, and manufacturing.

Venezuela's largest companies all have offices in Caracas. Many people in the city work in banks, insurance companies, shopping centers, and government offices. Important products made in Caracas include chemicals, clothing,



Mountains provide a beautiful background for the city of Caracas, Venezuela.

processed foods, paper, and medicines. Tourism also brings money to Caracas.

The Spanish founded the city in the 1560s. In 1577 Caracas became the capital of a Spanish province. English pirates attacked the city in 1595. Earthquakes almost destroyed Caracas in 1755 and 1812.

Caracas was the birthplace of Simón Bolívar, who led several revolutions against Spanish rule. Under his leadership Venezuela became the first colony to rebel against Spain. Venezuela became an independent country in 1830 with Caracas as its capital.

Many people moved to Caracas during the 20th century. The city grew quickly. In 1999 a rainstorm caused floods and mudslides throughout northern Venezuela. Many thousands of people in Caracas were killed.

► More to explore

Venezuela

Cardiff



Population
(2006 estimate)
317,500

Cardiff is the capital of Wales, one of the four main parts of the country called the United Kingdom. It is the largest city in Wales. The city lies where the Taff River flows into a part of the Atlantic Ocean.

The economy of Cardiff depends heavily on government activity and service industries such as health care, education, and tourism. The city is Wales's center of trade, shopping, banking, and insurance.

The Romans built a fort in the Cardiff area in ancient times. In the 1090s a landowner from England built another fortification on the same site. This became Cardiff Castle. A town grew around the castle.

Cardiff was a small town for hundreds of years. Coal mines were developed in the area in the late 1700s. After that Cardiff grew into a major port for shipping out coal. The city's coal trade ended in the 1960s. But Cardiff remained the most important city in Wales.

► More to explore

United Kingdom • Wales

Did You Know?

The Welsh name for Cardiff is Caerdydd.

Cardinal

Cardinals are American songbirds known for the male's bright red feathers. Both the male and the female sing a loud, clear whistling song year-round. The northern cardinal is one of the most common birds of North America. It is related to finches, grosbeaks, and many types of sparrows. Other species, or types, of cardinal live in South America.

Northern cardinals are found mainly in the United States east of the Rocky Mountains, in southeastern Canada, and in Mexico. These birds do not fly south for the winter. Instead they spend the entire year in the same area. They live in bushes, in gardens, and at the edges of woodlands.



Cardiff Castle is located in the middle of the city. The stone structure called the keep of the castle was built in the 1100s.



The male northern cardinal is a colorful visitor to birdfeeders in many parts of North America.

The northern cardinal is about 8 inches (20 centimeters) long. It has a pointed tuft of feathers, called a crest, on top of its head. The males are red with black face markings and red crests. The females and young cardinals have gray-brown backs. Their wings, tails, and crests are a dull red.

All cardinals have strong, cone-shaped bills. This helps them crush the seeds they eat. Cardinals also eat many kinds of insects and fruits.

► More to explore

Bird • Songbird • Sparrow

Cardiovascular System

Humans and many other animals depend on blood flowing through their bodies to keep them alive. The blood travels through a system that includes the heart and a network of blood vessels. This is called a cardiovascular system.

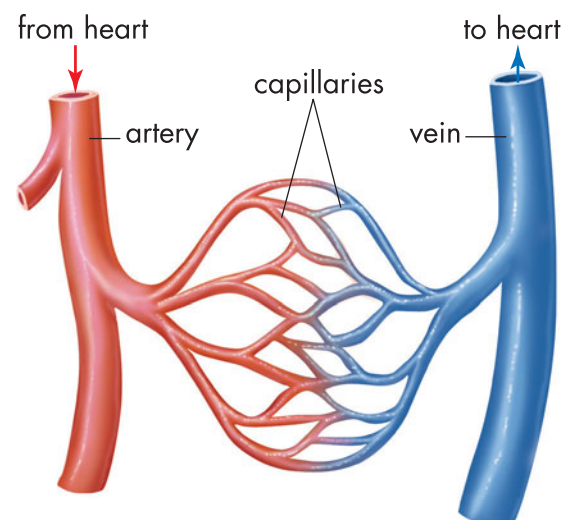
Heart

The human heart is a pear-shaped organ about the size of a fist. It is made up of a special type of muscle called cardiac muscle, which is not found anywhere else in the body. The heart acts as a pump to push the blood throughout the body.

The heart is separated into four chambers, or parts. The upper chambers are called atria, and the lower chambers are called ventricles. A valve, or a flap that can open and shut, connects each atrium to the ventricle below it. The valves control the movement of blood through the heart.

Blood Vessels

The blood vessels are a system of tubes that carry the blood throughout the body. The main vessels are arteries, veins, and capillaries. Arteries carry blood out from the heart. Veins return blood to the heart. Arteries are the thickest of all blood vessels. They



Blood flows from the heart through arteries and into capillaries. It then returns to the heart through veins.

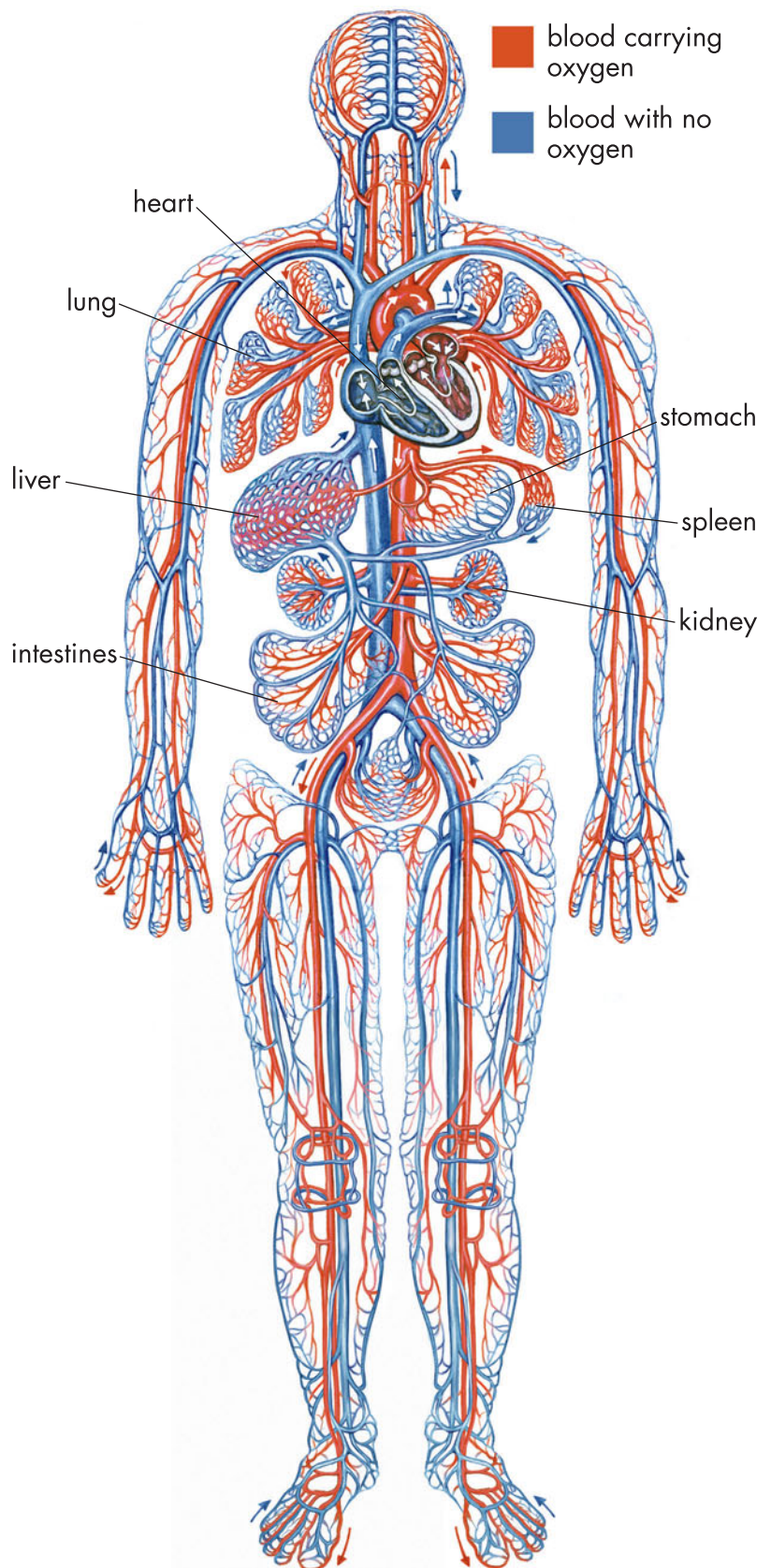
expand and contract to keep blood moving away from the heart. Veins contain valves that prevent blood from flowing backward. Capillaries are tiny passages that connect the arteries and the veins to the body's tissues.

Blood flows through the vessels in two very specific paths. In the first path, called pulmonary circulation, blood travels from the heart to the lungs. In the lungs carbon dioxide and other waste gases leave the blood. The blood takes in oxygen and then returns to the heart.

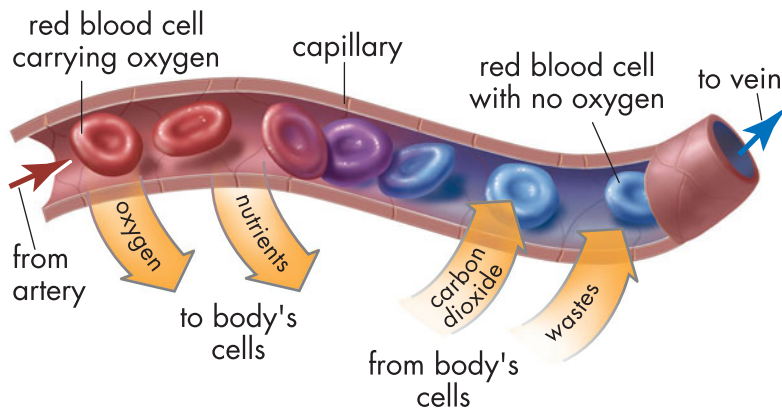
In the second path, called systemic circulation, the blood travels away from the heart throughout the body. The arteries carrying the blood branch out into smaller vessels called arterioles and finally into capillaries. In the capillaries the blood transfers oxygen and nutrients to cells in the body's tissues. The blood in the capillaries also collects waste products from the cells. From the capillaries the blood flows into small vessels called venules. These unite to form veins. The blood flows through the veins back to the heart.

Other Organs

In addition to the lungs, many other organs in the body interact with the cardiovascular system. Blood carries away nutrients from the intestines, which are part of the digestive system. The spleen and the liver filter, or clean, the blood by removing old blood cells and bacteria. The kidneys take water, minerals, and other waste products from the blood.



Blood continuously flows from the heart, throughout the human body, and back to the heart.



As blood travels through capillaries, it delivers oxygen and nutrients to the body's cells. It also picks up carbon dioxide and other wastes.

Diseases of the Cardiovascular System

When the force of the blood against the walls of the blood vessels is too high, a person has hypertension, or high blood pressure. Hypertension can weaken the heart and damage other organs.

Sometimes fatty deposits thicken and harden the walls of the arteries. When this happens a person has arteriosclerosis. Arteriosclerosis slows the flow of blood, which can lead to a heart attack.

► More to explore

Blood • Heart • Lung

Carib

The Carib were American Indians who lived in South America and on islands in the Caribbean Sea. The sea was named after the Carib.

The Carib first lived in small villages in northern South America. They built houses of pole frames covered with palm

leaves. They got their food by hunting and farming.

After AD 1000 many Carib moved to the Caribbean islands called the Lesser Antilles. The island Carib were more warlike than the South American Carib. They drove the Arawak people off the islands.

The island Carib were fierce fighters. After torturing and killing enemy men, they took the women into their tribe as wives or slaves. The Carib may have eaten the bodies of their enemies. This practice, called cannibalism, may have been part of the tribe's religion.

Spanish explorers began arriving in Carib lands in the late 1400s. The South American Carib were wiped out by fighting and by diseases brought by the Spanish. But the Spanish avoided the islands where the Carib lived. There was no gold on them, and the island Carib were too hard to defeat in battle. Other



A Carib man weaves baskets on the island of Dominica.

Europeans conquered the islands in the 1600s. Only a few Carib survived. Today their descendants live on the islands of Saint Vincent and Dominica.

The Garifuna are another group of people with Carib roots. The Garifuna originated when slaves brought from Africa mixed with island Carib. Garifuna today live in the Central American countries of Belize, Honduras, and Nicaragua.

► More to explore

Arawak • Caribbean Sea • Native Americans

Caribbean Sea



The Caribbean Sea sits between the islands of the West Indies and the coasts of Central and South America. It is a section of the Atlantic Ocean. The sea was named after the Carib Indians. The Carib lived on islands in the sea hundreds of years ago.

The Caribbean Sea has a mainly tropical climate. Temperatures are warm year-round. Tropical storms are common in summer in the northern Caribbean.



Many visitors come to the Caribbean Sea to look at wonders beneath the surface of the water.

Hurricanes often strike Caribbean islands between June and November.

The Caribbean region has mostly tropical plants. Rain forests grow in the high parts of Cuba, Jamaica, Puerto Rico, and other islands. Coconut palms are typical on the sandy shores of the islands. Monkeys, cats, sloths, parrots, and toucans live in the forests. In the sea itself, many fishes and other sea animals live along coral reefs.

The Caribbean economy depends heavily on tourism. With its sunny climate, the Caribbean is one of the world's most popular vacation places. Fishing is also important to the economy. Tuna, sardines, and spiny lobsters are valuable catches. Caribbean countries ship coffee, sugar, and bananas to the United States and Canada.

► More to explore

Atlantic Ocean • Carib • Coral • West Indies

Caribou

► see Reindeer.

Carnation



The carnation is a pretty flower with a pleasant smell.

The carnation is a flower that is often used in bouquets and corsages. People have grown carnations in gardens for more than 2,000 years. The scientific name of the carnation is *Dianthus caryophyllus*.

Carnations originally grew wild in the area around the Mediterranean Sea. Today most carnations are grown in gardens and greenhouses.

Carnation plants range from 1 to 3 feet (30 to 90 centimeters) in height. The stems are stiff. The flowers may be small or large. They have fringed petals. The first carnations had pink flowers. Growers developed white and deep red varieties in the early 1500s. The hundreds of kinds grown today include purple and yellow shades. Some carnations are striped.

Carnations often have a spicy smell. In the past people used carnations to spice wine. Carnations also were used to treat fevers. In 1907 the pink carnation was chosen as a symbol for Mother's Day.

► More to explore

Flower

Carp

Carp is the name of several fish in the carp family. One of the best-known carp is the common carp, a large freshwater fish. Goldfish and minnows also belong to the carp family.

Carp live in ponds, lakes, and rivers all over the world. Carp prefer warm, calm waters, but they can survive in nearly any type of fresh water.

Carp may be brownish yellow, greenish, or gray in color. Most types of carp have feelers, called barbels, at the corners of the mouth. The barbels help the carp find food in dark, muddy water. Different types of carp vary in size. The com-



Colorful carp swim in a pond in Japan. This type of carp, called koi, is popular in backyard and garden ponds.

mon carp may grow longer than 40 inches (100 centimeters). But it is usually only about 14 inches (35 centimeters) long.

Carp eat both plants and animals. When carp feed, they suck up everything from the bottom and spit out the dirt. This behavior muddies the water and can disturb other fish.

Carp live alone or in small groups. Female carp lay thousands of eggs each year. The eggs hatch within several days, and the baby carp grow quickly.

Carp is a popular food in Asia and Europe. People also eat carp in the United States and Australia. But many people in these countries consider carp to be pests.

► More to explore

Fish • Goldfish

Carroll, Lewis

The English author Lewis Carroll wrote the children's classics *Alice's Adventures in Wonderland* and *Through the Looking-Glass*. These books are beloved for their unusual settings, lively characters, and clever wordplay.

Carroll was born in Daresbury, England, on January 27, 1832. His real name was Charles Lutwidge Dodgson. He studied mathematics at Oxford University in England. For most of his life he lived at Oxford while teaching mathematics. He wrote books on mathematics and logic.



An illustration by John Tenniel shows Lewis Carroll's most famous character, Alice, as she grows larger and larger.

One day in 1862 Dodgson told three young girls tales about a child named Alice. Later he used the tales to write *Alice's Adventures in Wonderland*. It was published as a book in 1865. In the story Alice crawls into a rabbit hole and meets all sorts of interesting creatures. Another book about Alice, *Through the Looking-Glass*, appeared in 1871. Dodgson wrote the books under the name Lewis Carroll.

Dodgson also used the name Lewis Carroll to write books of poetry for children. In 1876 he published a famous nonsense poem, *The Hunting of the Snark*. He died in Guildford, England, on January 14, 1898.

► More to explore

Literature for Children

Carrot

Carrots are roots that people eat. They are highly valued for their sweet flavor.



Carrots are a popular garden vegetable. The main part of the carrot that people eat is the root of the plant.

Many carrots are also a good source of vitamins.

There are several types of carrot. The most common are orange. There are also white, yellow, and purple carrots. Most carrots are long. They are usually wide at the top and smaller at the end. Carrots are firm and crisp. The skin is mostly smooth, but it may have wrinkles that go from side to side.

Carrots grow where the temperature is cool to warm. Sometimes carrots push up above the ground. When this happens, the sun can turn them green. They will also taste bitter. To prevent this, farmers make sure carrots are completely covered with soil.

Leaves on long stalks grow out of the top of the carrot. On the ends of the stalks are flowers. They form an umbrella of tiny white or pinkish blooms. Small fruits grow from the flowers. Each fruit holds two seeds.

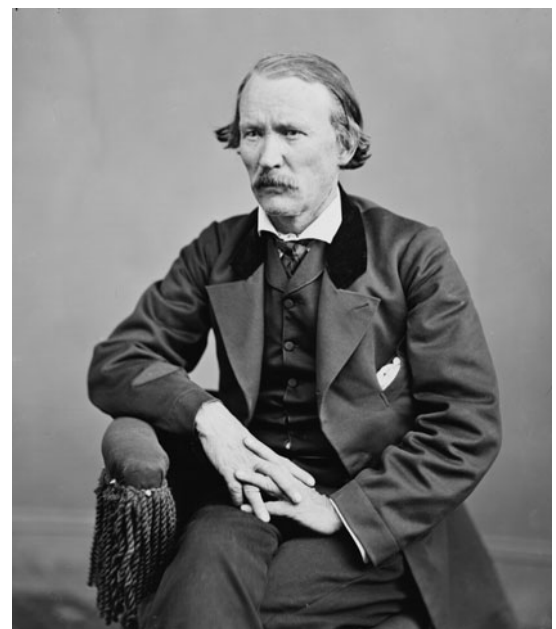
Carrots are eaten both fresh and cooked. They are used in many dishes, including

salads, stews, soups, sauces, and cakes. The juice of the carrot can also be a sweet drink. Orange carrots are a good source of a substance called carotene. The human body converts carotene into vitamin A.

Carson, Kit

The U.S. frontiersman Kit Carson helped make history as a fur trapper, guide, Indian agent, and soldier in the Old West. Nevada's capital, Carson City, was named for him.

Christopher Carson, nicknamed Kit, was born in Kentucky on December 24, 1809. When he was 1 year old his family moved west to Missouri. As a boy Kit fished, hunted, and trapped animals. When he was 15 his mother sent him off to learn how to make saddles. He soon decided that indoor work was not for him.



Kit Carson

In 1826 Carson ran away to New Mexico. There, at age 19, he joined some hardy fur trappers—called mountain men—on a trip to California. He took part in several fights with Native Americans.

In 1842 the explorer John Charles Frémont hired Carson as a guide for his trip to map the Oregon Trail. In 1846, on a trip to California with Frémont, Carson helped U.S. forces capture Los Angeles in the Mexican War.

In 1854 Carson became a government agent who dealt with the Ute people. During the American Civil War (1861–65) he organized and led a Union Army unit that fought Confederates and Native Americans in the Southwest. In 1868 Carson was put in charge of Indian affairs for Colorado Territory. He died in Colorado on May 23, 1868.

► More to explore

Frémont, John Charles • Mexican War

Carson City



Population
(2000 census)
52,457; (2007
estimate)
54,939

Carson City is the capital of the U.S. state of Nevada. The city is important as



The state Capitol in Carson City, Nevada, is surrounded by gardens.

a center of government and tourism. It is also a trade center for the area's mines, ranches, and farms.

The site of Carson City was on a route for pioneers traveling west to California. A trading post was established in 1851. The city was founded in 1858. In 1859 a large deposit of silver, known as the Comstock Lode, was discovered nearby. Carson City soon became crowded with miners. In 1869 the U.S. government opened a mint, or coin factory, in the city. The Carson City mint closed in 1893. However, the mint building later became a museum.

Carson City became the capital of the Nevada Territory in 1861. Nevada became a U.S. state in 1864 with Carson City as its capital.

► More to explore

Nevada

Carter, Jimmy

Jimmy Carter became the 39th president of the United States in January 1977. Many people thought that he was an unsuccessful president. However, Carter later won the 2002 Nobel prize for peace.

Early Life

James Earl Carter, Jr., was born on October 1, 1924, in Plains, Georgia. His father, Earl, was a businessman. His mother, Lillian, was a nurse. Jimmy was the first member of his family to complete high school. He went on to attend Georgia Southwestern College and the Georgia Institute of Technology. In 1946 he graduated from the U.S. Naval Academy in Maryland. That year he married Rosalynn Smith. The couple had three sons and a daughter. After his father's death in 1953, Carter returned to Georgia to manage the family peanut farm.



Jimmy Carter was the 39th president of the United States.

Political Career

Carter soon became involved in local politics. He was elected as a Democrat to the Georgia Senate in 1962 and 1964. In 1966 Carter ran for governor of Georgia but lost. Feeling depressed, he turned to Baptist Christianity. Carter ran again for governor in 1970. This time he won. In his inaugural address he called for an end to racial discrimina-



TIMELINE

Carter is born in Plains, Georgia.

October 1, 1924

Carter is elected president.

1976

Iranian students take hostages at the U.S. embassy in Iran.

1979

Carter wins the Nobel peace prize.

2002

Carter is elected governor of Georgia.

1970

Carter helps the leaders of Egypt and Israel agree to peace.

1978

Carter loses the presidential election to Ronald Reagan.

1980

tion. He appointed African Americans and women to government offices.

Presidency

Carter next decided to run for president. He won the Democratic nomination in July 1976. He chose Senator Walter F. Mondale as his vice presidential running mate. During the campaign, Carter called for efficiency and honesty in government. In November 1976 he won a narrow victory against the Republican president, Gerald R. Ford.

Carter took office during a severe winter and a terrible shortage of oil. He proposed an energy program to help the crisis, but Congress rejected it. Carter also tried to cut back government spending and to encourage the nation's poor economy. Many citizens could not find jobs, however, and prices kept rising.

In 1978 Carter persuaded the leaders of Egypt and Israel to sign a historic peace agreement. On January 1, 1979, Carter opened full diplomatic relations between the United States and China. A serious crisis overshadowed those successes, however. On November 4, 1979, Iranian students invaded the U.S. Embassy in Iran and took more than 50 people hostage. Most of the hostages were not freed until January 1981.

The bad economy and the hostage crisis caused voters to question Carter's skills as president. Carter lost the 1980 election to the Republican candidate, Ronald Reagan.

Retirement

Carter's public image improved after he left the White House. He and his wife founded the Carter Center in Atlanta, Georgia, to promote peace and human rights. He traveled widely to help settle international conflicts. He helped build homes for the poor with the organization Habitat for Humanity. He also wrote several books on politics and religion.

► More to explore

Ford, Gerald R. • Human Rights
• Nobel Prize • Reagan, Ronald
• United States

Carthage

The ancient city of Carthage was founded by the Phoenicians on the north coast of Africa in about 800 BC. Until it was overthrown by Rome in 146 BC, Carthage was the trading center of the western Mediterranean Sea. Today Carthage is a suburb of Tunis, the capital of Tunisia.



A gold coin from Carthage dating from the 300s or 400s BC shows the goddess Persephone.

According to legend, Carthage was founded by Dido, daughter of the king of Tyre. Tyre was a Phoenician city in what is now Lebanon. Dido ran away to Africa after her husband was killed. She chose to settle on a peninsula covered with low hills, facing a bay called the Lake of Tunis.

The Carthaginians were seafarers and traders. They traded in foodstuffs, textiles, slaves, and metals such as tin, silver, gold, and iron. The city prospered from the late 500s BC on. It even established its own colonies in North Africa, southern Spain, and the Mediterranean.

Carthage fell to Rome after a series of wars. These were called the Punic Wars, after Poeni, the name by which the Romans called the Phoenicians. In the first Punic War, from 264 to 241 BC, Carthage lost the island of Sicily. In the second, from 218 to 201 BC, a Carthaginian army led by Hannibal crossed the Alps by elephant to defeat

the Romans. However, Hannibal was later defeated in North Africa. In the third, from 149 to 146 BC, Carthage was looted and burned.

In 122 BC the Romans founded their own colony on the site. In AD 533 the Byzantine Empire took control of the area. The Arabs captured the city in 705 and made the nearby town of Tunis their capital.

► More to explore

Phoenician • Rome, Ancient • Tunis

Cartier, Jacques

Like many other European explorers, Jacques Cartier went to North America looking for gold, spices, and perhaps a shortcut to Asia. Instead he found the Saint Lawrence River, which became France's main route into Canada.

Jacques Cartier was born in 1491 in Brittany, a province of France. In about



1534, the king of France asked him to lead an expedition to North America.

In the spring of 1534 Cartier sailed across the Atlantic Ocean to what is now Canada. There he and his crew explored the land around the Gulf of Saint Lawrence and encountered Native Americans. When he sailed back to France, he took with him two Native Americans.

A second voyage came in May 1535. This time, Cartier sailed deeper into the Gulf of Saint Lawrence and into the Saint Lawrence River. The two Native Americans he had taken before had learned French, and they served as guides. About 260 miles (420 kilometers) inland, Cartier reached the Native American village of Stadacona. Today, the city of Quebec stands near that place.

Cartier and his men were among the first Europeans to winter in what is now Canada. The bitter cold surprised them, and some of the men died. After returning to France he reported tales told by the native people of treasures farther inland.

Cartier once again crossed the Atlantic in 1541. He explored further and found what he thought were gold and diamonds. When he returned to France in 1542, he was told that they were just the common minerals pyrite (fool's gold) and quartz. After his third voyage Cartier never returned to North

America. He died near Saint-Malo, his birthplace, on September 1, 1557.

► More to explore

Canada • Saint Lawrence River and Seaway

Cartoon

Cartoons are drawings that make a point, tell a joke, or tell a story. Cartoons can be about almost anything. Many cartoons are about the things that everyday people say and do. Others are about the news, government leaders, or historical events. Many cartoons try to make people laugh.

Types of Cartoons

Comic strips are a popular type of cartoon. A comic strip usually has four or more drawings in a row that tell a connected story. Comic strips feature a cast



Cartoonist Charles Schulz works on a "Peanuts" comic strip. He drew this popular cartoon for about 50 years.

of characters, such as the children in the comic strip “Peanuts.”

Other types of cartoons include political cartoons, gag panels, and animated cartoons. Political cartoons show what is wrong with the government or make fun of it. They are usually single drawings, but there are some political comic strips. Gag panels are single drawings that make fun of everyday life. Animated cartoons are cartoons filmed as movies or television shows.

Cartoons may be found in newspapers, magazines, and books. Comic books and graphic novels are books filled with many comic strips or cartoons.

History

People have been using pictures to tell stories since prehistoric times. Prehistoric artists drew pictures of animals on the walls of caves. In ancient Egypt, Greece, and Rome, artists painted pictures on vases and walls. These pictures recorded historical events, the lives of important people, and legends.

From the 1500s to the 1700s people got the news through short printed works that had many pictures. Many of these pictures were early forms of political cartoons. Political cartoons became common throughout Europe and the United States during the 1800s.

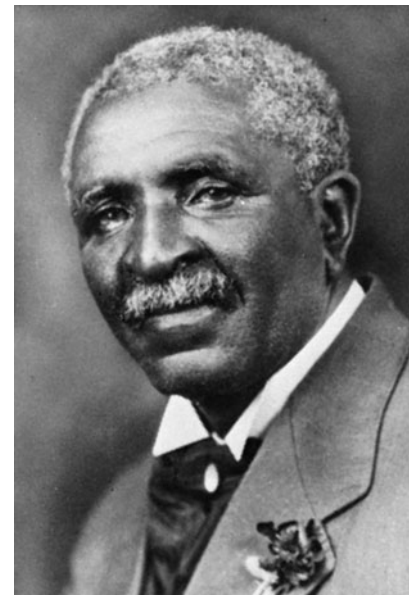
During the 1900s funny gag panels and comic strips became more popular than political cartoons. Popular cartoons of the late 20th and early 21st centuries

included “The Far Side,” “Calvin and Hobbes,” “Bloom County,” and “Get Fuzzy.”

► More to explore

Animation • Drawing

Carver, George Washington



George Washington Carver

George Washington Carver was born in slavery but went on to win worldwide respect for his work as a scientist. By finding new ways to process peanuts, soybeans, and sweet potatoes, he helped to make them important crops in the southern United States.

Carver was born in about 1861 near Diamond Grove, Missouri. At about age 12 he left home. He eventually attended Iowa State Agricultural College in Ames, Iowa. He received a bachelor's degree in agriculture in 1894 and a master's degree in 1896. Carver then became

Did You Know?

Comic strips became a regular feature of U.S. newspapers in the early 1900s.

head of the agriculture department at the Tuskegee Institute in Alabama. There he stayed for the rest of his career.

Before Carver's time, Southern farmers grew very few crops other than cotton, a plant that wore out the soil. Carver tried to get them to switch to peanuts and soybeans. These plants were legumes. They added nitrogen, a fertilizer, to the soil and also could be made into nutritious foods.

With his laboratory work, Carver tried to make sure that farmers who grew these crops would be able to sell them. He developed 300 products from peanuts. He also took an interest in sweet potatoes and developed more than 100 products based on the plant.

Carver's efforts won him numerous honors and improved life throughout the South. Some scientists criticized his informal methods, however. In addition, some African Americans were disappointed because he did not take a strong public stand on racial issues.

Carver died in Tuskegee on January 5, 1943. He was buried on the Tuskegee campus.

► More to explore

Cotton • Legume • Peanut

Caspian Sea

The world's largest inland body of water is the Caspian Sea. Lying between Europe and Asia, it is bordered by Russia and Azerbaijan on the west, Kazakh-



stan and Turkmenistan on the north and east, and Iran on the south. The sea was named for the Kaspi, ancient peoples who once lived on its western shores.

The Caspian Sea is nearly the size of Japan, covering an area of about 143,000 square miles (370,000 square kilometers). The sea is shallowest in the north, where the depth averages just 13 to 20 feet (4 to 6 meters). The deepest parts are in the south. In one place the seafloor lies 3,360 feet (1,024 meters) below the water's surface. Three major rivers—the Volga, the Ural, and the Terek—empty into the Caspian from the north. The sea contains as many as 50 islands, most of them quite small.

The Caspian has long been famous for its sturgeon. These fish produce eggs that are made into the salty delicacy called caviar. The number of sturgeon greatly declined, however, as the water level of the Caspian dropped during the 1900s. Today the chief industry of the Caspian region is the production of oil and natural gas. Surrounding countries

collect these products from the seabed and sell them to other countries.

Caste

In some countries a person's place in society is decided by a caste system. The caste that they belong to is based on their wealth, occupation, and family background. Although the term is used to describe groups in other countries, the system is most well developed in India.

Did You Know?

In India there are thousands of different *jatis*. This is because each city or region may have its own set of castes.

In India, castes are called *jatis* and are grouped into four *varnas*, or categories. At the top are Hindu priests and scholars; next are the rulers and military leaders; then merchants, traders, and farmers; and, last, craftspeople, workers, and servants. A group of people who used to be called the untouchables ranks even below this last group. In the early 1900s the Indian leader Mahatma Gandhi renamed these people Harijans (children of God). Gandhi did not believe in the caste system and fought to end it.

In later years India's caste system became somewhat more flexible. Even though there was pressure to end it completely, the caste system continued into the 21st century.

► More to explore

Gandhi, Mahatma • Hinduism • India

Castle

For many centuries castles provided both protection and living quarters for

kings, nobility, and sometimes common people. The fortifications, or military defenses, built into a castle set it apart from a palace. A palace is usually a grand house for a king or noble. Most castles were built in Europe between the 800s and the 1400s, during the period known as the Middle Ages. But castles were built in North Africa, western Asia, India, and Japan as well.

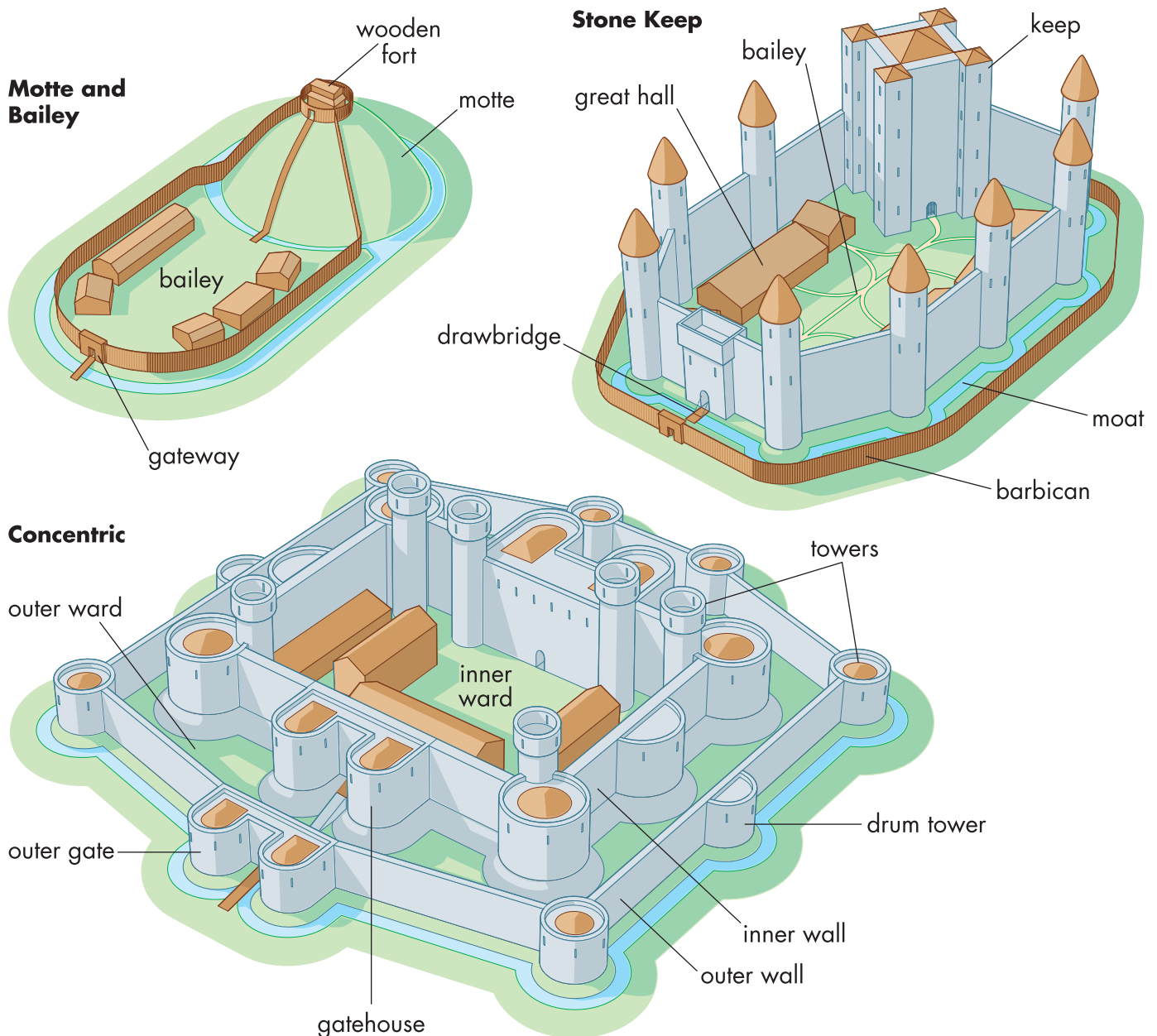
Motte and Bailey Castles

One early type of castle was the motte and bailey castle. The motte was a high mound of earth. A fenced-in tower, usually made of wood, stood on the motte. Next to the motte was a lower, larger walled area called the bailey. The castle's other buildings, such as workshops and stables, stood within the bailey. A ditch called a moat protected the motte and sometimes the bailey, too.

Later Castles

Over time castles were made stronger. Beginning in the 1100s builders increasingly used stone instead of wood. A typical stone castle was surrounded by a moat. The main walls of most castles were very thick—sometimes more than 15 feet (4.6 meters). Special defenses blocked the entrance. A hinged drawbridge across the moat could be pulled up to cover the gateway. In front of the gateway hung the portcullis, a heavy grate that slid in stone grooves and could be dropped into place very quickly. Farther inside was a large gate.

Within the walls was a central structure called the keep, or donjon. This replaced the tower that stood on the motte of the



The three main types of castles are the motte and bailey castle, the stone castle and keep, and the concentric castle.

earlier castles. It was the strongest and most secure part of the castle. Some keeps consisted of one high building. Others took the form of a high wall that enclosed several buildings. In early stone castles the keep had everything needed to withstand a long siege. During a siege, enemies camped outside and prevented anyone from entering or leaving.

In castles built later, however, the keep became a place to go for safety after all other defenses had failed.

Beginning in the late 1200s a new design began to appear. These had walls in the shape of a square. Round towers were spaced along the walls. Inside was another, larger wall with large towers

and a gatehouse. These were called concentric castles. The living quarters and other buildings were within the inner walls. There was no need for a keep because the towers were used for defense.

Decline of the Castle

Castles lost their usefulness in the late Middle Ages. Large firearms developed at that time could hurl cannonballs over or through a castle's walls. Beginning in about 1500 forts replaced castles as military defenses, and rulers lived in palaces or mansions. Some castles still stand today and are popular tourist attractions.

Castries



Population
(2001 census),
city, 10,634

Castries is the capital of Saint Lucia, an island country in the Caribbean Sea. Mount Fortune rises high above the town and its pretty beaches. Castries is the country's largest town and chief port. Tourism and banking are also important to the town's economy.

Hundreds of years ago the Carib Indians lived on the island. French people settled there in the mid-1600s. For many years the French and British



Locally grown produce is sold at a market in Castries, Saint Lucia.

battled for control of the harbor at Castries. The island changed hands several times. It became a British colony in the early 1800s. In 1979 Saint Lucia became an independent country with Castries as its capital.

► More to explore

Saint Lucia

Castro, Fidel

Fidel Castro ruled the country of Cuba for many years. He established a form of government called Communism. This meant that he had a great deal of control over the country and its people.

Early Life

Fidel Castro was born on August 13, 1926, in eastern Cuba. His father was a farmer who grew sugarcane. As a boy



Fidel Castro

Fidel worked in the fields. Later he went to law school. There he became involved in politics. He graduated in 1950. As a lawyer Castro defended the poor.

Revolutionary

The leader of Cuba at the time was a man named Fulgencio Batista. Many people opposed Batista. He treated his enemies harshly. He also stole money from the country.

Castro and his brother Raúl formed a group to oppose Batista. On July 26, 1953, the group attacked a military post. Most of the attackers died, and the Castros were imprisoned. After they were released from prison they continued to attack the government. On January 1, 1959, Batista left Cuba. Castro soon took control of the country.

Dictator

As leader of the country, Castro brought changes to Cuba. He took control of factories and farms. He permitted no

political opposition. However, he did make some changes to help the common people. Many Cubans left the country when Castro took over. Some of them later returned to try to overthrow Castro, but they were not successful.

For many years the Soviet Union supported Cuba's economy. After the Soviet Union broke up in 1991, Cuba's economy struggled. Castro then allowed some economic reforms. In the early 2000s he began to suffer health problems. When he had surgery in 2006 he gave his brother Raúl power to rule until he recovered. In 2008 Fidel Castro officially stepped down as president of Cuba.

► More to explore






Communism • Cuba

Cat

The domestic cat, or house cat, is a small mammal that has lived among people for thousands of years. People have kept cats as pets, used them as hunters, and even worshipped them as gods. Domestic cats belong to the same animal family as the lion, tiger, jaguar,



A domestic cat sits atop a fence.

Some Longhair Breeds of Cat			
	Name	Origin	Features
	Himalayan	United States, Europe	sapphire-blue eyes; thick body; short, full tail
	Maine Coon	United States	large, muscular body; shaggy coat of fur
	Persian	possibly Iran	thick body; large head
	Ragdoll	United States	blue eyes; heavy and powerful build
	Turkish Angora	Turkey	long, full tail; large, pointed ears

leopard, puma, and cheetah. The scientific name of the domestic cat is *Felis catus*.

Where Cats Live

Domestic cats live with people in nearly every part of the world. Some domestic cats have no home. These cats, called feral cats, wander freely in many cities.

Physical Features and Breeds

The domestic cat has a long and powerfully built body. Males are about 28 inches (71 centimeters) long. Females are about 20 inches (51 centimeters) long. Large, forward-facing eyes help the cat to see well, even at night. Its triangular ears can turn quickly toward the source of a sound. Four rows of stiff whiskers grow on each side of the nose.

Small groups of whiskers also grow on other parts of the body. These give the cat a delicate sense of touch.

A cat’s fur may be black, white, brown, gray, yellow, red, or orange. It may also be striped (tabby); a mixture of white, black, and yellow (tortoiseshell); or marked with patches of color (calico). Cats use their rough tongues to comb and to clean their fur.

There are many breeds of domestic cat. Cats of the same breed have a similar length of hair and other similar features. Most breeds—for example, the Abyssinian, the American Shorthair, and the Siamese—have short hair. Other breeds, including the Persian, have long, thick coats.

Some Shorthair Breeds of Cat			
	Name	Origin	Features
	Abyssinian	probably Egypt	slim body with long legs
	American Shorthair	United States	broad, muscular body; thick fur
	Bengal	United States	spotted coat; hind legs shorter than forelegs
	Cornish Rex	England	curly, short coat; large ears
	Japanese Bobtail	Japan	triangular head with large ears; rabbitlike tail
	Manx	Isle of Man	tailless or with stump; double coat of fur
	Russian Blue	Russia	blue coat with silver tips; muscular
	Scottish Fold	Scotland	folded ears; short, rounded body
	Siamese	Asia	sapphire-blue eyes; long, lean body
	Sphynx	Canada	hairless; large ears

Behavior

Domestic cats are carnivores, or meat-eaters. Many hunt and eat small ani-

mals, including birds, mice, and rabbits. They use their claws, which they can draw back or in, and their strong, sharp

Did You Know?

The Egyptian goddess Bast, or Bastet, was represented in pictures and statues as a lioness or as a woman with a cat's head.

teeth to catch prey. House cats eat mainly canned or dry food made especially for cats.

The cat is the only animal that makes a sound called a purr. Cats produce purring in their throat. No one knows exactly why cats purr, but it may be a sign of comfort. Cats also make other sounds, including meowing, hissing, yowling, and growling.

Life Cycle

A female cat gives birth to a litter of kittens about two months after mating. A female may have two to three litters a year. The average litter is four kittens, but there may be only one kitten or as many as seven. A newborn kitten is about 3 inches (8 centimeters) long. It has no teeth, the ears lie flat, and the eyes are closed. A kitten's full development takes about one year. Cats may live to be about 15 years old.

Cats and Humans

About 4,500 years ago the ancient Egyptians worshipped cats. The Egyptians probably domesticated, or tamed, wild cats about 3,500 years ago. They used these cats to kill the rats and mice that ate their stored grain. Cats were also present in Greece, China, and India in ancient times.

During the Middle Ages (about AD 500–1500), many Europeans feared cats because cats were linked with witches. Some people still think that black cats are unlucky.

Today millions of people around the world keep cats as pets. In the United States there are more pet cats than pet dogs.

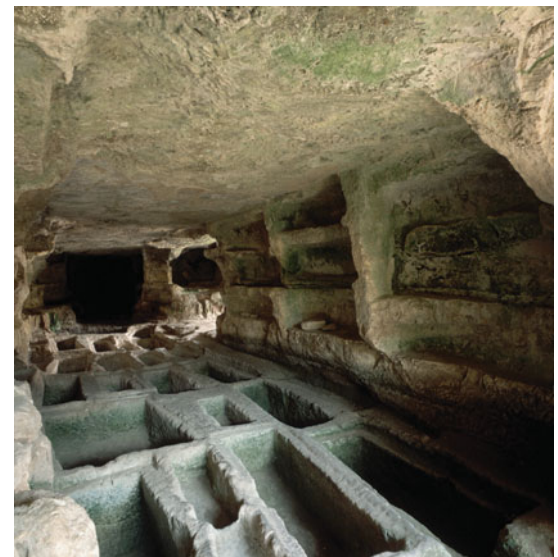
► More to explore

Cheetah • Jaguar • Leopard • Lion
• Mammal • Puma • Tiger

Catacomb

In ancient times people in the region surrounding the Mediterranean Sea buried their dead in underground tunnels and rooms. They cut these tunnels and rooms, called catacombs, out of a layer of soft stone below the ground.

The most famous catacombs were created around Rome, Italy, by early Christians. About 40 Christian catacombs have been found in the area. Most were built between about AD 200 and 400. The Jews and many other peoples also built catacombs in ancient times.



People were buried in stone graves on the floor and in the walls of a catacomb in Italy.

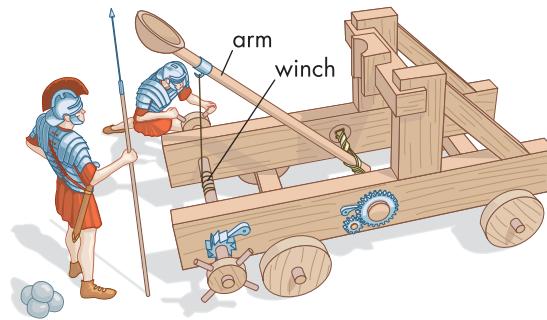
Stairways led from ground level to the catacombs below. The catacombs were long, narrow passageways with rows of rectangular graves carved out of the rock along the sides. Several rows of graves were stacked from floor to ceiling. In Christian catacombs rooms along the passageways were used for burying martyrs (people who were killed because of their religion) or several members of a family. On the walls of some of the rooms are prayers and paintings of religious symbols or figures.

In the centuries after the fall of the Roman Empire in 476, invading armies destroyed many of the Roman catacombs. By about the 800s the catacombs were no longer used, and over the years people forgot about them. They were rediscovered by accident in 1578. Since then people have studied the catacombs for the clues they offer about ancient peoples.

Catapult

Catapults were important weapons of war before guns and cannons were invented. A catapult was a simple machine. It was used to throw heavy objects at the enemy with great force.

There were several different forms of catapult. The most basic type was made up of a long wooden arm with a large cup on the end. Attached to the arm was a rotating tube, called a winch. A rope was fastened to the arm and wound around the winch. At the base of the arm was a set of cords.



A small catapult with wheels would have been used in battle.

To set the catapult, soldiers tightened the rope by winding the winch. This caused the cords at the base of the arm to twist and get tighter and tighter. The soldiers loaded the cup with a large rock or other objects. Then they released the rope. The cords around the base untwisted all at once. The arm then swung forward, flinging the load. A large catapult could hurl a stone as far as 1,500 feet (460 meters).

Soldiers often used catapults to destroy castle walls. They usually needed more than one catapult for a successful attack on a castle. Soldiers also used catapults to fling spears at an advancing army.

Armies used large and small catapults. They wheeled small catapults with them to battles. Carpenters traveling with armies often built catapults on the way to a battle. Larger catapults usually stayed in one place. People living in cities and castles used such large catapults to defend themselves.

The earliest catapults appeared during the 1200s BC. The ancient Romans improved the catapult and made catapults on wheels. Today's armies use

devices based on the catapult to launch missiles and airplanes.

► **More to explore**

Castle • War

Caterpillar

► see Butterfly and Moth.

Catfish

A catfish is a fish that has one or more pairs of whiskerlike feelers by its mouth. These feelers, known as barbels, help the fish to taste and to feel. There are about 2,500 species, or kinds, of catfish. They are related to the carp, characins, and minnows.

Catfishes live in freshwater on all the major continents. A few types live in oceans.

Catfishes range greatly in size. One of the largest types is the wels. This catfish may be more than 15 feet (4.5 meters) long. Some of the smallest catfish species are barely 2 inches (5 centimeters) long.



A catfish's "whiskers" are called barbels.

Catfishes do not have scales. Some types have an armor of bony plates. Many types have stiff, poisonous points on their back and sides.

Catfishes generally live near the water's bottom. They tend to be active at night. They feed on almost any kind of animal or plant material. Some kinds of catfish build a nest for their many eggs. Other kinds carry their eggs in their mouth.

Many people like to catch and to eat catfishes. People often keep small catfishes in aquariums.

► **More to explore**

Carp • Fish

Cathedral

A Christian church that is the home church of a bishop is known as a cathedral. Bishops oversee many churches in a particular region, so the cathedral is often larger and more decorative than the others. However, cathedrals may be of any size and style. Especially huge and magnificent were the cathedrals built in the Gothic style between about the 1100s and 1400s in Western Europe. Gothic cathedrals are usually made of gray stone, feature a round window above the altar, and have tall, arched windows along the sides. The windows are often made of stained, or colored, glass. Artists and craftsmen were eager to decorate these cathedrals, which were the center of a town's religious life.

Among Europe's famous cathedrals are Notre Dame in Paris, France; Saint



Saint Colman's Cathedral in Cobh, Ireland, towers above the surrounding buildings.

Mark's in Venice, Italy; Canterbury in England; and Cologne in Germany. North America is also home to a number of notable cathedrals. They include Saint Patrick's in New York City; Notre Dame in Montreal, Quebec; and the national cathedral in Mexico City, Mexico.

► More to explore

Architecture

Catholicism

► see Roman Catholicism.

Cattle

Cattle are large, hoofed mammals that people raise for their meat, milk, or hides. In some places cattle also pull carts or farm equipment. Cattle belong to the scientific family Bovidae. This family also includes buffalo, bison, and yaks.

Cattle have many different names. Young cattle are called calves. A grown female that has not had a calf is a heifer. A female that has been a mother is a cow. A male adult is called a bull, a steer, or an ox.

Where Cattle Live

Cattle live almost everywhere in the world. Domestic, or tame, cattle often live on farms or ranches. In Asia and Africa there are both wild and domestic cattle. In India people let cattle roam freely throughout the cities and the countryside. This is because followers of Hinduism consider cattle to be holy.

Physical Features and Breeds

There are many different breeds of cattle. Cattle of the same breed have a similar color and size. Their coat of hair may be black, white, gray, yellow, brown, or red. Cattle may also have spots or areas of different colors. Depending on the breed, bulls weigh from 1,000 to 4,000 pounds (450 to 1,800 kilograms). Cows weigh from 800 to 2,400 pounds (360 to 1,000 kilo-



Gauchos, or cowboys, herd cattle in the Patagonia region of Argentina.

grams). Many breeds have horns, but some do not.

People raise some breeds mostly for their milk and others mostly for their meat. Cattle raised for milk are called dairy cattle. The most popular dairy cattle in the United States include the Holstein-Friesian, Brown Swiss, Jersey, and Guernsey breeds. Cattle raised for beef include the Angus, Shorthorn (or Durham), Hereford, and Brahman breeds.

Many domestic breeds originally came from Europe. Some originally came from Asia. For example, Brahmans originally came from India. Brahmans look different from other domestic cattle. They have a hump over their shoulders and neck, curving horns, and drooping ears.

Did You Know?

Cattle tear grass out of the ground with a sideways movement because they have no upper front teeth.

Behavior

Wild and domestic cattle eat grasses and other plants. After they swallow their food, they bring it up from the stomach to chew and swallow it again. This process is called chewing the cud. It helps cattle to digest tough plants. Farmers may also give special feed to domestic cattle to make them fatter.

Cattle and Humans

Cattle are very important to the economies of many countries as well as to small farmers. Cattle provide people throughout the world with meat, milk, cheese, and butter. People also make cattle hides into leather goods. In addi-

tion, cattle help to plow farmers' fields and haul heavy loads.

► More to explore

Bison • Buffalo • Mammal • Yak

Cave



Huge stalagmites are a highlight of Carlsbad Caverns in New Mexico.

A cave is a natural hollow space under the ground that has an opening large enough for a person to enter. Caves range in size from tiny passages to huge systems of connected “rooms” and tunnels. The world’s longest cave system is Mammoth Cave, in the U.S. state of Kentucky. It is more than 350 miles (560 kilometers) long. Large caves are often called caverns.

Types of Caves

Most caves are called solution caves. Solution caves most often form in places where there is a type of rock called limestone. Limestone is a soft rock that dissolves, or breaks down, easily in water.

As water flows through small cracks in the limestone, the limestone dissolves and the cracks get bigger. Over a long time these cracks become large enough for people to enter.

Not all caves form in limestone. They can form in such rock as gypsum, marble, and dolomite. Caves may also form when melted rock, called lava, flows from volcanoes. The lava on the surface may cool while the lava beneath flows away. When this happens a cave is sometimes created. Caves may also form when earthquakes cause large cracks in solid rock. Ocean waves sometimes form sea caves along the coast. The action of the waves removes soft rock and forms hollow spaces.

Some caves do not form in rock. Glaciers, or huge areas of ice that move over land, can form ice caves. As water melts on the glacier's surface, it flows into

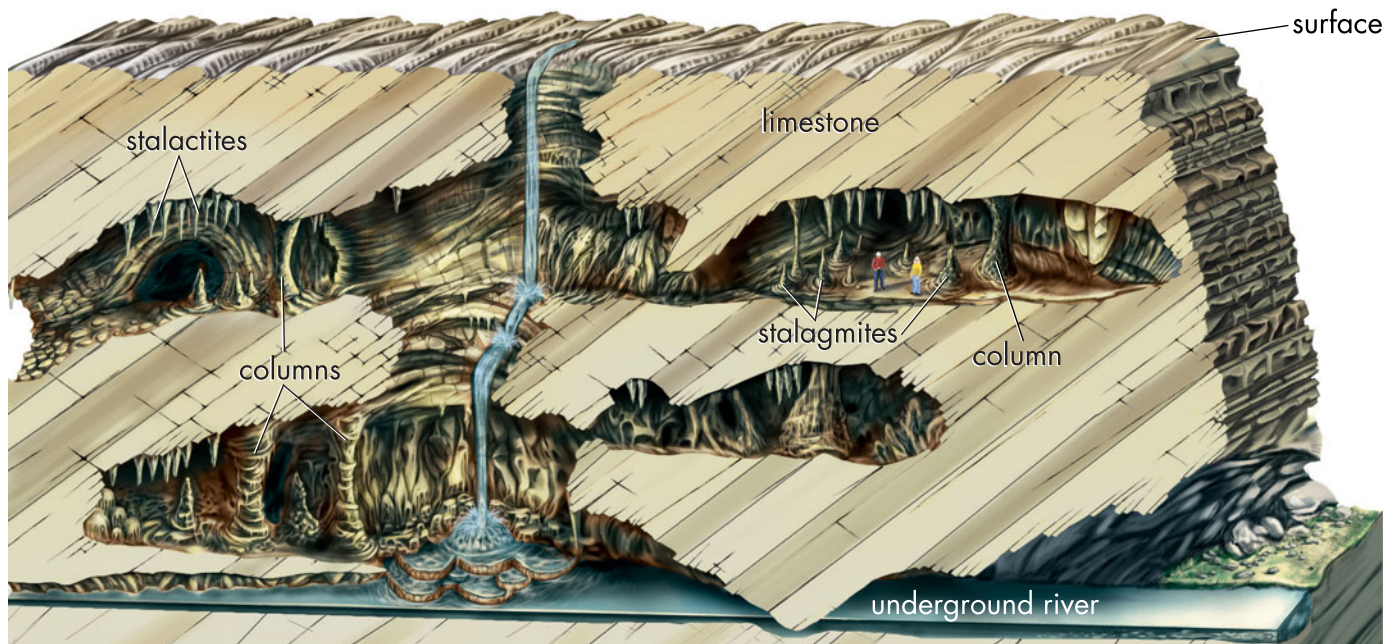
cracks in the ice. The water then carves out caves beneath the surface of the ice.

Cave Features

After a solution cave is formed, water continues to drip into it. Minerals in the water are slowly deposited on the ceiling and floor of the cave. Over time those mineral deposits, or crystals, build up into large formations. Those that hang down from the ceiling are called stalactites. They look like icicles. Stalagmites point up from the floor. They usually grow under dripping stalactites. Sometimes stalactites and stalagmites join together to form columns.

Cave Exploration

Cave explorers are people who like to find and explore caves. They are also called cavers or spelunkers. Sometimes they wiggle through tiny passages just big enough to get through. Other times they walk through passages that are tall



Water dripping into a cave contains minerals that build up on the ceiling and the floor. Over time the minerals may form stalactites, stalagmites, and columns.

Did You Know?

The Big Room in Carlsbad Cavern in the U.S. state of New Mexico is about 2,000 feet (610 meters) long and 255 feet (78 meters) high.

and wide. Sometimes they need ropes and special gear to cross or go down deep holes.

Cave exploration can be dangerous. Cavers are well trained to know how to explore safely. A person should never enter a cave without experienced cavers.

Cave-dwelling Animals

Caves are the home of many different animals. Some, such as bats, live in caves but come out at night to feed. Other cave-dwelling animals live their entire lives underground. Without light, they are usually white or transparent (clear) and do not have eyes. Blind animals found in caves include many different insects and spiders, types of shrimp, and some salamanders.

Animals that live in caves have special characteristics to help them survive. Those characteristics are called adaptations. Cave animals may not have sight, but their other senses are highly developed. For example, insects that live in caves usually have very long antennae to feel their way around. Other animals can feel vibrations, which tell them that something to eat is nearby.

Uses of Caves

People have been using caves for a long time. Early humans often camped in the entrances of caves. All over the world there are caves that people used as a place to live. In Europe there are caves with drawing of animals that are more than 15,000 years old. Scientists study these caves and drawings to learn more about how the people lived.

Caves are also used for recreation. There are many caves that people can visit without special equipment. Visitors to other caves need special equipment and lights. These caves require training to explore.

► More to explore

Adaptation • Bat • Limestone

Cayuga

The Cayuga were one of the five original Native American tribes of the Iroquois Confederacy. The confederacy was an alliance of tribes that lived in upper New York State and spoke similar languages. The Cayuga originally lived around Cayuga Lake.

Like the other Iroquois, the Cayuga lived in longhouses. They made longhouses by covering a wooden frame with wood and bark. Longhouses were large



Red Cloud was a chief of the Cayuga tribe.

enough to house several families. Cayuga men hunted animals and birds and also fished. Women grew corn, squash, and beans.

Throughout the late 1600s the Iroquois fought and won many wars with other Indian tribes. The Cayuga took into their tribe many people from the tribes they defeated, including the Erie and the Huron. Like most of the other Iroquois, the Cayuga sided with the British in the American Revolution (1775–83). After the Americans won, settlers gradually took over the Cayuga homeland. Many Cayuga moved to Canada, Oklahoma, or western New York. At the end of the 20th century there were about 2,000 Cayuga. Half of them lived in the United States, and half lived in Canada.

► More to explore

Iroquois • Native Americans

Cedar

Cedars are evergreen trees that belong to the pine family. Their wood is highly valued because it does not rot easily. It also has a beautiful reddish color and a pleasant smell.

There are four species, or types, of cedar. Three of them originally grew only in the mountains around the Mediterranean Sea. They later spread to other areas. The other species grows in the Himalaya Mountains of southern Asia.

Cedars are tall trees with spreading branches. They can grow to a height of more than 100 feet (30 meters). Cedars



A group of cedars grows tall in Lebanon.

have leaves that are like needles. They grow in clusters along the branches. Cedars also produce large cones that hold their seeds.

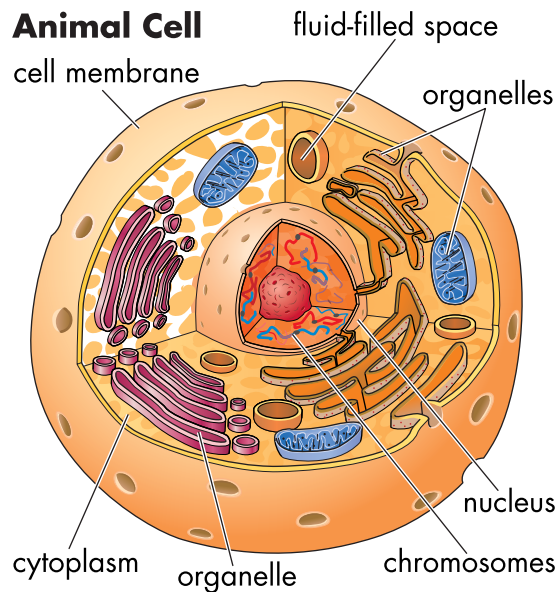
Many other trees that have fragrant, reddish wood are called cedars. But most of them are actually cypress or juniper trees. Their wood is used to make clothing chests, closets, and pencils. Oil taken from the eastern red cedar, a juniper, is used in perfumes.

► More to explore

Cypress • Juniper • Pine • Tree

Cell

Every organism, or living thing, is made up of structures called cells. The cell is the smallest unit with the basic properties of life. Some tiny organisms, such as bacteria and yeast, consist of only one cell. Large plants and animals have many billions of cells. Human beings are made up of more than 75 trillion cells. The study of cells is a branch of biology.



Animal cells do not have cell walls. They can change size and shape more easily than plant cells.

General Features

Cells exist in a variety of shapes and sizes. For example, they may be cube-shaped or flat. They vary in size, too, but they are all very small. About 10,000 human cells could fit on the head of a pin. Bacteria cells can be much smaller.

Regardless of its shape and size, every cell can perform certain functions on its own. A cell can digest nutrients to provide its own energy. It can also produce new cells by making copies of itself. Most cells do this by dividing. In organisms with many cells, each cell must also cooperate with other cells.

Most many-celled organisms have cells of various kinds. The cells form different structures and perform different functions. Different types of animal cells, for example, form muscles, eyes, or teeth.

Different plant cells form flowers, fruits, or seeds.

Parts of a Cell

Most cells have three main parts—the cell membrane, the cytoplasm, and the nucleus. The cell membrane is like the skin of the cell. The cytoplasm performs many functions to keep the cell alive. The nucleus can be thought of as the cell's brain.

Cell Membrane

The cell membrane is a thin but tough wall surrounding the cell. It allows useful substances to enter the cell. But it blocks the entry of harmful substances. The membrane also forces out waste products.

Cytoplasm

The cytoplasm is composed mainly of water, with some solids. Most of the cell's constant work of keeping alive is performed in the cytoplasm. Special organs, called organelles, within the cytoplasm make important substances called proteins. Cells use proteins in most of their chemical processes. Other organelles change food molecules into material needed for energy and growth. A network of tubes transports material within the cell.

Nucleus

The nucleus is located near the center of the cell. It is surrounded by its own membrane. The nucleus acts as the control center of the cell. It regulates the cell's growth and reproduction.

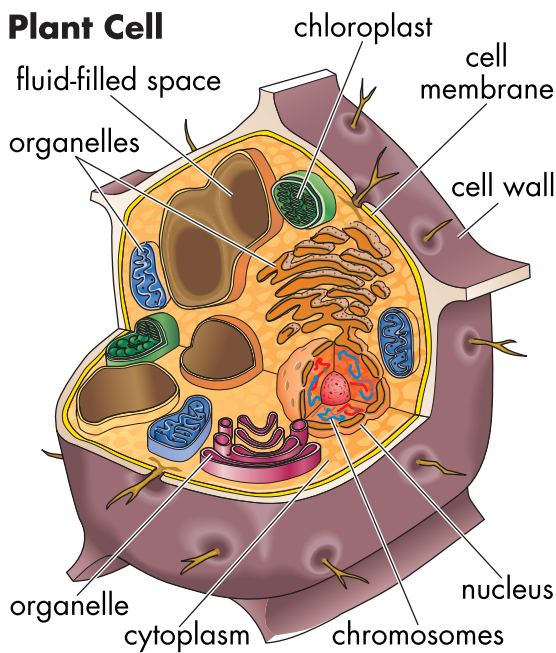
The nucleus contains structures called chromosomes. Chromosomes contain the cell's genes, which determine the characteristics of the cell. When the cell makes copies of itself, the genes pass on the cell's traits to the new cells.

Types of Cells

Although they have many things in common, cells are different in different types of living things. The main types are plant cells and animal cells. Simpler organisms, including bacteria, have simpler cells. They have a membrane and cytoplasm but no nucleus.

In plant cells, a rigid wall surrounds and protects the cell membrane. The wall is made of a woody substance called cellulose. A plant's cell walls make the plant stiff enough to grow tall.

Plant Cell



Plant cells have stiff cell walls to help plants grow tall. They also have chloroplasts, which contain chlorophyll. Chlorophyll helps plants make food.

Animal cells do not have cell walls. This allows animal cells to change more in size and shape than plant cells can. However, most many-celled animals need structures such as bones to support their bodies. They also need shells or tough skins to protect them. Special cells form these structures.

In addition, most plants have a chemical called chlorophyll in their cells. This makes the plants green. Chlorophyll helps plants make food from the energy in sunlight. This process is called photosynthesis. Animal cells do not contain chlorophyll.

► More to explore

Biology • Chromosome • Genetics
• Living Things • Photosynthesis

Celt

The Celts were a group of people who spread throughout Europe in ancient times. They ranged from what is now Turkey in the east to the British Isles and northern Spain in the west.

Historians have learned about the Celts by studying objects that they left behind. The oldest information about the Celts comes from graves of Celtic chiefs, or leaders, found in Austria. The graves date from about 700 BC.

The Celts lived in tribes. Each tribe had a chief, warriors, free farmers, and slaves. Most tribes lived in protected villages, often on a hilltop. There were fields and pastures nearby for farming and raising cattle.

Did You Know?

A scientist named Robert Hooke was the first to describe cells. In 1655 he saw through a microscope the boxlike units that made up a piece of cork.



A beautiful gold bowl displays the skill of Celtic artists.

The Celts were one of the first peoples in Europe to work with iron. They made swords, shields, helmets, and gold and silver jewelry.

The Celts practiced a religion called Druidism. Their priests were called Druids. The Druids taught that souls lived forever by passing from one person to another at the time of death.

Celtic power in western Europe lasted for only a few hundred years. Then Romans, Carthaginians (a people from North Africa), and German tribes took over. The Celts kept their unique culture only in parts of the British Isles and in the Brittany region of northwestern France. Some people in Ireland, the highlands of Scotland, the Isle of Man, Wales, and Brittany still speak Celtic languages.

► **More to explore**
Europe • Iron

Cement

The fine powder called cement is one of the main ingredients of concrete. When cement combines with water it becomes a paste. This paste is used to hold together all of the other materials that make up concrete.

In ancient times people used clay or a paste made of ground-up stone and other ingredients to hold their buildings together. Over the years people tried other combinations of materials. In the 1800s they came up with the combination that is still used today.

To make cement, large blocks of a type of stone called limestone are crushed or ground into small stones. The stones are then mixed with other minerals and ground some more. The result is then sent to an oven that is shaped like a giant tube. The materials are heated to a very high temperature as they flow down the tube. Some of the materials



A construction worker pours concrete. Cement is one of the main ingredients of concrete.

melt. This liquid mixes with the solid materials to form cement chunks about the size of marbles. The chunks are called clinker.

After the clinker leaves the oven it is allowed to cool. It is then mixed with another mineral called gypsum and ground to a fine powder. That powder is the finished cement.

► More to explore

Concrete

Censorship



A poster in New York City calls for an end to censorship in the arts.

Sometimes governments or other powerful groups set limits on people's freedom to speak or publish. This is called censorship. People who practice censorship are called censors.

Censors may examine books, newspapers, magazines, and speeches. They

may also review paintings, photographs, films, television shows, songs, e-mails, or other materials. If censors find information they do not want people to see or hear, they may ban the material, or keep it from being passed around. They may cut the information out of the material. Sometimes they may even punish the person who created the material.

Types of Censorship

Many types of censorship exist. People fight to ban books they do not like from school libraries. School boards try to get teachers not to teach certain subjects in the classroom. Sometimes advertisers do not like the television shows on the channels where their advertisements appear. They may refuse to advertise on those channels if the shows are not changed. Filmmakers sometimes change the language or the action in a movie to make it suitable for a wider audience.

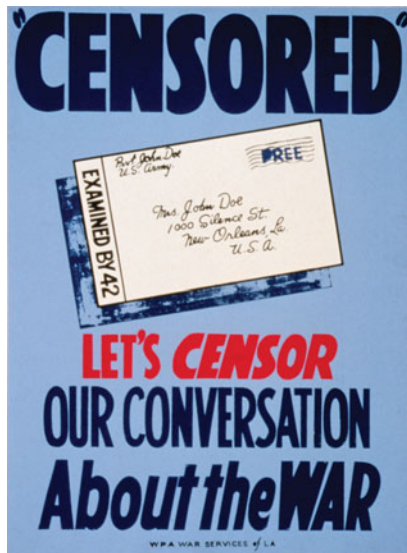
People agree that some forms of censorship are necessary. A person is not free to shout "Fire!" in a crowded theater when there is no fire. Such an action would cause a panic and endanger lives. Also, governments can refuse to tell the public certain information if the safety of the nation is at stake. For this reason, many countries accept a greater level of censorship during wartime.

History

Governments and religious leaders have practiced censorship since ancient times. In ancient Rome, someone who criticized the government might be fined, removed from society, or put to death.

Did You Know?

Until 1966 the Roman Catholic church kept a list of books that Roman Catholics were not supposed to read.



During World War II (1939–45) the U.S. government asked citizens to censor their own letters and conversations. The government did not want people to discuss war plans that enemies might read or overhear.

The early Roman Catholic church censored anything that went against the church's teachings. The Inquisition, a court of the church, could punish people who spoke against the church.

Until modern times, printers in many countries had to let government censors read any work before it was published. If the censor disapproved, the work was not printed.

During the 1700s, people began to protest more strongly against censorship. In 1791 the U.S. Bill of Rights limited government censorship by guaranteeing the freedom of speech. Since then, many democratic nations have adopted similar laws. However, in countries with Communist governments or dictatorships, censorship is still strong. The people in

these countries may do and say only what the government approves.

► More to explore

Bill of Rights • Dictatorship
• Inquisition • Printing

Census

A census is a count of the people who live in a country. It also tells things about those people—their backgrounds, what they own, and how they live. Governments and businesses use censuses to guide important decisions. There are also censuses that focus on topics other than population, such as housing, farming, or industry.

Taking a Population Census

Censuses are expensive and take a long time. Governments in many countries, including the United States, take a census only once every 10 years. Other countries take a census every five years.

Census workers use a combination of methods to try to reach every person.



Census workers sometimes go to people's homes to interview them.

They mail question forms to homes. They also interview people face-to-face or over the phone. Most people have to answer only a few basic questions. But some people are asked for more information. The questions cover such topics as where the person lives, how old they are, whether or not they are married, and how many children they have. The questions also ask about a person's job, religion, ethnic background, language, and education.

After the information has been collected, census workers sort and study it. They put the information into reports that show different characteristics of the population. For example, census workers can report how many people live in rural areas compared to how many live in cities. Or they might report the size of the average family in a particular state.

Using the Information

Many governments use census results to make sure that different parts of the country are represented fairly in government. States with more people get to send more representatives to the national legislature (lawmaking body). Governments also use census information as a guide for providing money and services. For example, a government might send more money for schools to areas that have a lot of children.

History

The rulers of ancient Babylonia, China, Egypt, and Rome all took censuses. These rulers used censuses to find out how people could serve the government. For example, they wanted

to know how many men they could force to serve as soldiers. They also wanted to know who the wealthy people were so they could tax them. The people often gave incorrect information in these censuses. They were not honest because they did not want to fight in wars or to be taxed.

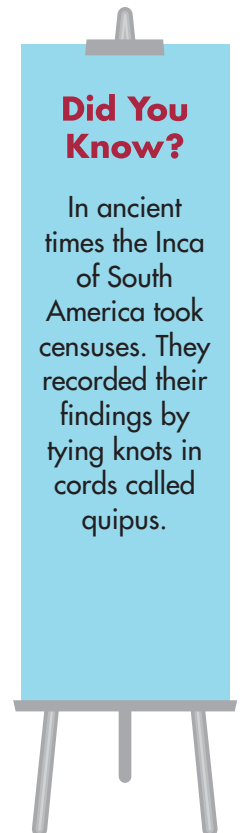
Censuses as they are known today did not begin until the 1600s. Leaders stopped using censuses only as a way to identify people for their own purposes. Countries started thinking of censuses as a way to understand the people and society. Then people were more willing to give correct information. Censuses became more accurate.

In 1790 the United States made history with its first census. This census was the first taken to decide how many representatives each state would have in Congress. It became a model for other countries to follow. England took its first census in 1801. France took its first reliable census in 1836. Canada's first census was in 1871, and India's was in 1872. China did not take its first accurate census until 1953.

The amount of information collected by censuses has grown over the years. And the technology used to process and publish the information has advanced. Census takers in the United States first used mechanical adding machines in 1870. They started using electric machines in 1890. A giant computer called UNIVAC processed the 1950 census.

Did You Know?

In ancient times the Inca of South America took censuses. They recorded their findings by tying knots in cords called quipus.



Now census results are published on the Internet.

► **More to explore**

Government

Centipede and Millipede

The crawling creatures called centipedes and millipedes belong to the same animal group—the arthropods—as insects and spiders. But centipedes and millipedes have many more legs than other arthropods. There are more than 2,500 species, or kinds, of centipede. There are about 10,000 species of millipede.

Where Centipedes and Millipedes Live

Centipedes and millipedes live all over the world, but they are most common in the tropics. Most types like dark, moist places. The house centipede of North America and Europe lives in buildings.



The name centipede means “hundred-footed,” but only some centipedes have that many legs. Others have fewer, and some have as many as 354.

Physical Features

Centipedes and millipedes have long, thin bodies that are divided into segments, or sections. They range in length from just 0.08 inch (2 millimeters) to 12 inches (30 centimeters). Millipedes are generally smaller.

In a centipede, every body segment except the head and the rear has one pair of legs. Centipedes may have from 14 to 177 pairs of legs. In a millipede, the three segments behind the head have only one pair of legs. Every other segment has two pairs of legs. No millipede has more than about 200 pairs of legs.

Most kinds of centipedes and millipedes have only a few body segments when they hatch. They add segments each time they go through a process called molting, when they shed their hard outer covering.

Behavior

Centipedes hide during the day and come out at night to hunt. They kill their prey with poisonous claws. Centipedes usually eat insects, spiders, and other centipedes.

Most types of millipedes eat rotting plant material. They are equipped to protect themselves rather than to attack. Some types have special glands that produce a smelly or poisonous liquid or gas. Others curl up into a ball for protection.

► **More to explore**

Insect • Spider

Central African Republic



The country of the Central African Republic is located in the heart of Africa. Bangui is the capital.

The Central African Republic is surrounded by Chad, Sudan, the Democratic Republic of the Congo, the Republic of the Congo, and Cameroon. Most of the country occupies a plateau, or flat raised area. Mountains rise in the north and the west. The country has a tropical climate with rainy and dry seasons each year.

Savanna, or grassland with scattered trees, covers much of the north. Antelope, baboons, buffalo, elephants, and black rhinoceroses live in the savanna. Dense rain forests in the south are home to gorillas, chimpanzees, leopards, and bongos (striped antelope). Crocodiles and hippopotamuses live in the rivers.

There are more than 80 ethnic groups in the Central African Republic. Major

groups include the Gbaya, the Banda, and the Mandjia. Sango is the most commonly spoken language. Both Sango and French are official languages. Most of the people live in the south and the west. Most people follow Christianity, though many practice traditional African religions or Islam.

Farming is the major economic activity of the Central African Republic. Crops include cassava, yams, peanuts, bananas, and corn. The country also produces wood, cotton, and coffee to sell to other countries. Diamonds and gold are the only minerals that the Central African Republic produces.

Many peoples lived in this region for thousands of years before Europeans arrived. France gained control of the area in the 1800s. In 1906 France united the region with Chad to form a colony named Ubangi-Shari-Chad. In 1910 the region became part of French Equatorial Africa, which also included Chad, Congo, and Gabon.

In 1960 the Central African Republic declared independence from France. Harsh dictators and the military ruled until 1993, when the country held its first democratic elections. Political troubles continued into the 21st century, however.

► More to explore

Bangui



Facts About CENTRAL AFRICAN REPUBLIC



Population
(2008 estimate)
4,424,000

Area
240,324 sq mi
(622,436 sq km)

Capital
Bangui

Form of government
Republic

Major cities
Bangui, Bimbo, Berberati, Carnot, Bambari, Bouar

Central America



Central America is a narrow strip of land that lies at the southern end of North America. It connects that continent with South America. The region consists of seven countries: Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama.

Land and Climate

No place in Central America is more than 125 miles (200 kilometers) from the sea. The Pacific Ocean lies to the southwest, and the Caribbean Sea lies to the northeast.

The land is mostly mountainous and rugged. The highest point in Central America is the volcano Tajumulco in Guatemala, near the border with Mexico. It reaches 13,845 feet (4,220 meters).

Low-lying plains are found in the north, along the coasts, and near Lake Nicaragua. This lake is the largest body of water in Central America.

Central America lies within the tropics, or the warm areas near the equator. The lowlands generally have hot weather. The highlands are mild or cool. More rain falls during the summer than in winter. The Caribbean side is wetter than the Pacific side.

Plants and Animals

Tropical rain forests grow in the lowlands of eastern Central America. In the highlands the forests include pines and oaks. Cloud forests grow at elevations of about 6,000 feet (1,800 meters). These forests, which are nearly always dripping wet, include evergreen oaks, laurels, and orchids. Shrubs and low trees grow in higher places.

Central America's wild animals include the jaguar, the ocelot, the puma, the coyote, and the gray fox. A variety of monkeys live in the forests. Among the region's birds are colorful parrots, big-billed toucans, and long-tailed quetzals.

People

About three fifths of the people have a mixture of Amerindian (Native Ameri-



Capuchin monkeys live in some of the rain forests of Central America.



Women in traditional dress gather in a busy market in Guatemala.

can) and European ancestors. About one fifth of Central Americans are fully Amerindian. Smaller numbers of people have mainly European, African, or Asian roots.

Spanish is the official language of all Central American countries except Belize. In Belize English is the official language. Many people speak Mayan and other Amerindian languages, especially in Guatemala.

Roman Catholic Christianity is the main religion in Central America. Some groups mix Christianity with Amerindian religions.

Education is better in Panama and Costa Rica than in Guatemala and other northern countries. Medical care also tends to be poorer in the north.

Economy

Central American countries grow several crops to sell to outside countries. The three most important crops are coffee, bananas, and sugarcane. Many small

farmers grow corn, beans, and squash for local markets.

Central American industries process food, beverages, and tobacco. They also produce clothing, shoes, drugs, chemicals, cement, paper, and wood products. Tourism and other services are also important to the economies of Central America.

History

Humans have lived in Central America for thousands of years. Between 4000 and 1000 BC, groups of Amerindians began to settle in certain places and farm the land. Some of these people, called the Maya, eventually built a great civilization. Mayan culture reached its peak between about AD 250 and 900.

European explorers arrived in Central America in the 1500s. Spanish conquistadors, or conquerors, soon took control of the region. The Amerindian population, weakened by new European diseases, fell quickly.



Tourists climb the ruins of a Mayan temple in present-day Guatemala.

The Spanish ruled most of Central America as provinces of the Kingdom of Guatemala. This colony also included parts of southern Mexico. It did not include Panama. The Spanish ruled Panama first from Peru and later from Colombia. The only other European rulers in the region were the British. The British claimed Belize (at first called British Honduras) in the 1700s.

Central America gained its independence from Spain in 1821. Guatemala, Honduras, El Salvador, Costa Rica, and Nicaragua briefly joined Mexico. In 1823 they again declared independence and formed the United Provinces of Central America. Guatemala City was the capital. By 1840, however, each member state had gone its separate way. Panama remained part of Colombia until it gained independence in 1903. (Belize did not gain independence from Great Britain until 1981.)

The new countries experienced political troubles from the 1800s into the 1900s. They disagreed about where their borders should be. Civil wars broke out. Many dictators (leaders with unlimited power) ruled harshly. The United States sent in troops several times. By the end of the 1900s, however, democratic governments had begun to develop in Central America.

► More to explore

Belize • Conquistador • Costa Rica • El Salvador • Guatemala • Honduras • Maya • Nicaragua • North America • Panama

Ceramics

Ceramics are hard objects that people make from inorganic materials, or materials that did not come from plants or animals. Ceramics have many useful characteristics. In general they are strong, although they may be brittle, or easily breakable. Heat, water, air, and chemicals do not easily damage them. In addition, they usually do not conduct, or pass along, electricity.

Traditional ceramic objects are made from clay or other minerals that come from the ground. This type of ceramics includes pottery and bricks. People have been making these types of objects for thousands of years.

Today scientists and engineers make ceramics out of many different materials. These modern ceramics have many uses. Computer chips, cars, pens, and faucets may have ceramic parts. Dentists use ceramics to fix teeth. Special ceramic tiles protect space shuttles from the tre-



Ceramic plates and tiles are made from clay.

Did You Know?

Central America has about 20 active volcanoes. They form the most active volcanic belt in the Americas.

mendous heat created by their passage through Earth's atmosphere when they return to Earth.

► More to explore

Brick and Tile • Pottery

Cereal

► see Grain.

Cerebral Palsy

Cerebral palsy is a disability caused by a certain kind of brain damage. The word cerebral refers to a part of the brain called the cerebrum. This part of the brain controls the movement of muscles. The word palsy means a kind of paralysis, or loss of movement. Thus, people with cerebral palsy have trouble controlling the movements of their muscles.



A boy with cerebral palsy has a guide dog to help him with everyday activities.

The muscles of people with cerebral palsy may be weak, or they may twitch. Some muscles may also “freeze” in a certain position. This lack of muscle control can make standing, walking, and talking difficult. Some children with cerebral palsy have mental disabilities, but many do not.

There is no single cause of cerebral palsy. In most cases the exact cause is unknown. The brain damage that leads to the disability most often happens while a baby is developing inside the mother. The damage may occur because the brain is deformed or because it does not get enough oxygen. An infection in the mother, such as rubella, is another possible cause.

Babies can also develop cerebral palsy after they are born. Severe head injuries sometimes lead to cerebral palsy. Such infections as meningitis may also cause cerebral palsy.

There is no cure for cerebral palsy. Medicines can help to control unwanted muscle movements. Leg braces and physical therapy (special exercises) can improve a person's balance and movement. Speech training can sometimes develop a person's speaking abilities.

► More to explore

Brain • Muscle

Ceres

► see Demeter.

Did You Know?

The first signs of cerebral palsy usually appear before age 3.



Chad

Located in north-central Africa, the Republic of Chad links Arab North Africa with the cultures south of the Sahara Desert. The capital is N'Djamena.

Chad is surrounded by Libya, Sudan, the Central African Republic, Cameroon, Nigeria, and Niger. Lake Chad lies in the west. Mountains rise in the north, east, and south. The Sahara runs across the north. Central Chad is part of the semidry Sahel region. The southern plains are tropical. Most of Chad is hot, with rainy and dry seasons.

Facts About CHAD



Population
(2008 estimate)
10,111,000

Area
495,755 sq mi
(1,284,000 sq km)

Capital
N'Djamena

Form of government
Republic

Major cities
N'Djamena, Moundou, Bongor, Sarh, Abéché, Doba

The Sahara has little vegetation and wildlife—mainly antelope, gazelles, and ostriches. In the Sahel thorny shrubs, acacia trees, and grasses grow. Elephants, hippopotamuses, rhinoceroses, warthogs, giraffes, antelope, lions, leopards, and cheetahs live in the Sahel. Tropical grasses and scattered trees grow in the south.

Chad has more than 200 ethnic groups. The largest group is the Sara, followed by Arabs. Most of the people live in rural areas. The official languages are French and Arabic, but more than 100 different languages are spoken. More than half of the people are Muslims, and about one third are Christians.

Agriculture is Chad's main economic activity. Farmers grow peanuts, sorghum, millet, cassava, and yams. They raise cattle, goats, and sheep. Trade is



also important to the economy. Chad produces and sells cotton, textiles, and petroleum (oil).

Various peoples lived around Lake Chad beginning in prehistoric times. In the 700s people known as Berbers from North Africa began to arrive. They founded an empire called Kanem-Bornu, which controlled the region until the 1800s. In 1910 France made the region part of French Equatorial Africa. In 1946 Chad became an overseas territory of France.

Chad gained independence in 1960. Civil war soon broke out between different political groups. Chad held presidential elections in the 1990s, but political fighting continued.

► More to explore

Kanem-Bornu Empire • N'Djamena
• Sahara

Chalk

Chalk is a soft, whitish rock. It is a type of limestone. Like other forms of limestone, it is made from animal shells and takes many years to form. It has many uses.

Chalk is found throughout much of northwestern Europe. England's famous white cliffs of Dover are made from chalk. In the United States, chalk deposits are found in Arkansas, Louisiana, Texas, and Wyoming.

Chalk is made from the shells of tiny sea creatures. When these animals die, their shells sink to the sea floor. Mud covers the shells. Layers of shells and mud slowly build up. A chalk deposit forms when this material hardens. The whole process can take millions of years. Sometimes the water level drops. When this happens, the chalk can rise above the water's surface. This is how chalk cliffs are formed.

Chalk is white or gray. It is also porous. This means that rain and other water can get into it. After many years, lots of

rain can collect in an area of chalk. Some cities get their drinking water from these collections of water. Oil and natural gas also collect in chalk.

Chalk is very useful. Powdered chalk is used in toothpaste and stomach medicines. Chalk is also used to make such products as paint, rubber, and cement. Artists draw with chalk. Teachers write on blackboards with chalk. However, the chalk used by artists and teachers is sometimes not true chalk. It is often mixed with other ingredients or it is made from a mineral called gypsum.

► More to explore

Limestone • Rock

Chameleon

The lizards called chameleons are well-known for being able to change the color of their skin. Chameleons live in Africa, Asia, and Europe. The lizards that are commonly sold as chameleons in North American pet shops are actually anoles. Anoles also change color but not as strikingly as true chameleons do.

Most chameleons live in trees. Their toes are divided into two groups to help them grasp branches. They do not move well on the ground. They spend as little time as possible there.

Chameleons range in length from about 1.5 inches (4 centimeters) to 24 inches (60 centimeters). Most chameleons are 7–10 inches (17–25 centimeters) long.

Did You Know?

A chameleon can look in two directions at once because it can move each eye separately.



Cliffs made of chalk, a type of limestone, line the southeastern coast of England.



A panther chameleon's V-shaped toes help it grasp tree branches.

Chameleons can change color because they have special cells under their skin. Inside these cells color particles move around. The chameleon takes on the color of whichever particles are packed together most closely. Green, yellow, and brown are common chameleon colors.

Many people think that chameleons change color to blend in with their surroundings, but this is not true. Instead, color changes depend on such factors as temperature, light, and emotions such as fear and anger. Chameleons also use color changes to communicate with each other.

Like most lizards, chameleons eat insects. They use their long, sticky tongues for catching prey. Large chameleons also eat young birds.

► More to explore

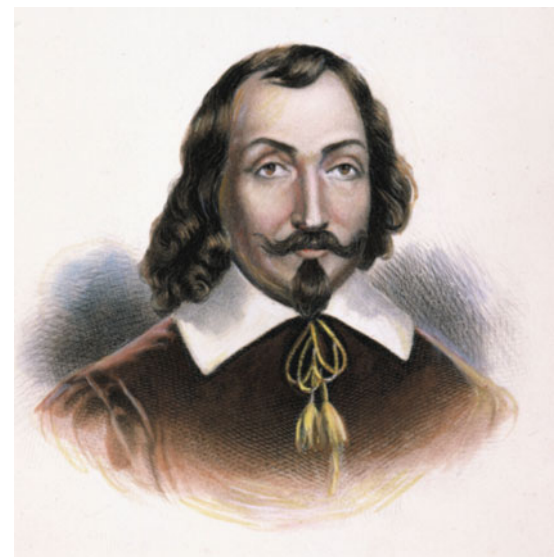
Lizard

Champlain, Samuel de

The French explorer Samuel de Champlain traveled along the seacoasts, lakes, and rivers of North America in the early 1600s. Known as the Father of New France, he founded the city of Quebec and encouraged French settlement in what is now Canada.

Champlain was born in 1567 in Brouage, a small French port. His father was a sea captain. Young Samuel learned navigation from him and led voyages to the West Indies and Central America.

In 1603 Champlain made his first visit to New France, the lands the French claimed in North America. He returned in 1604 with a group of settlers who started a colony in what is now Nova Scotia. Though the colony failed, Champlain used his time there to explore the Atlantic coast as far south as what is now Rhode Island.



Samuel de Champlain

Champlain sailed to Canada again in 1608 and founded Quebec as a trading post on the Saint Lawrence River. It was the first lasting French settlement in North America. Champlain made friends with the Huron people of the region. In 1609 he traveled south with the Huron to fight the Iroquois in what is now New York. There he came upon the lake that is now called Lake Champlain. In 1615, on yet another trip, he reached Lake Huron. He was the first European known to reach the Great Lakes.

In 1628 the English seized Quebec during a war with the French. Champlain was captured and taken to England. After the war he returned to Quebec. He died there on December 25, 1635.

► More to explore

Canada • Saint Lawrence River and Seaway

Charlemagne

As leader of the kingdom of the Franks, Charlemagne united many of the Christian lands of western Europe during the Middle Ages. He was declared the emperor of this collection of states, which eventually came to be called the Holy Roman Empire. He was a great warrior, but he also respected and preserved learning. His name means Charles the Great.

Early Life

Charles was born in about AD 742. He was the elder son of Pippin III. Unlike most people of his day, Charles learned to read. He also formed a lifelong devotion to the Christian church.

Charles's father became king of the Franks in 751. At that time Europe consisted of many independent





A picture from the 1400s shows Emperor Charlemagne.

kingdoms that had grown up after the Roman Empire collapsed in the 400s. The Franks occupied what is now France and some surrounding regions. Pippin's army aided the pope, who was the head of the church, in several campaigns against a tribe called the Lombards. Young Charles learned from his father's efforts.

Conquests

Pippin died in 768 and Charlemagne's brother died in 771. After that, Charlemagne ruled the Franks. He also began to conquer the other tribes around him. Charlemagne met defeat in northern Spain against the Muslims in 778, but he defeated the Lombards in Italy and eventually the Saxons of central Germany.

Charlemagne made his capital in western Germany at Aachen (known to the French as Aix-la-Chapelle). On Christmas day of 800, Pope Leo III crowned him emperor of the West. Charlemagne

then attempted to restore much of the unity of the old Roman Empire.

Influence

Charlemagne was a great reformer. He set up a money system to promote trade, built roads and bridges, and encouraged better farming methods. He invited scholars to his court, collected books, and founded a school.

Charlemagne died in 814 and was succeeded by his son Louis. Louis died in 840 and his three sons split up the empire. Even so, the Holy Roman Empire survived—in one form or another—for nearly 1,000 years.

► More to explore

Frank • Holy Roman Empire

Charles, Ray

Music lovers call Ray Charles the Genius. Charles was a gifted singer and piano player who also wrote music. He blended gospel, rhythm and blues, and jazz to create a new form of music called soul.



Ray Charles

Ray Charles Robinson was born on September 23, 1930, in Albany, Georgia. (He later dropped his last name, Robinson.) He grew up in Florida. Ray began losing his sight at a young age. By age 7 he was blind. He studied music at the School for the Deaf and Blind in Saint Augustine, Florida.

In the late 1940s Charles played piano for blues and jazz bands. In the 1950s he started making records. His hit songs included “What’d I Say”; “Georgia on My Mind”; “Hit the Road, Jack”; and “I Can’t Stop Loving You.” Beginning in 1955 Charles toured throughout the United States and in other countries.

Charles won 13 Grammy awards for his recordings. In 1986 he was voted into the Rock and Roll Hall of Fame. Charles died on June 10, 2004, in Beverly Hills, California.

► More to explore

Popular Music

Charleston



Population
(2000 census)
53,421; (2007
estimate)
50,478

Charleston is the capital of the U.S. state of West Virginia. It is the state’s largest city. Charleston lies on the Kanawha River.



The state Capitol in Charleston, West Virginia, faces the Kanawha River.

Charleston is the economic center of a region rich in minerals. Coal, oil, and natural gas are shipped out from the city. Services, such as government and health care, and manufacturing are important to the economy.

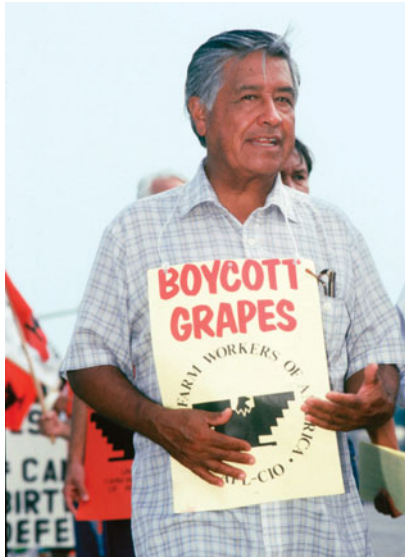
A town was established at the site in the late 1700s. The town grew because it was on a popular river route to the Ohio Valley. For many years Charleston was an important center for salt mining. In 1862 Charleston was the site of a battle during the American Civil War. The following year West Virginia became a separate state from Virginia. In 1877 Charleston was named the permanent capital of West Virginia.

► More to explore

West Virginia

Chavez, Cesar

As a child Cesar Chavez was a migrant worker, moving from place to place to work on farms. As an adult he helped improve the lives of migrant farmwork-



Cesar Chavez

ers in the United States by organizing them into a labor union.

Cesar Estrada Chavez was born on March 31, 1927, near Yuma, Arizona. During the Great Depression of the 1930s his family became migrant farmworkers in California. By age 15 Cesar was working full-time in the fields. During World War II he served in the U.S. Navy.

In 1952 Chavez joined a group that helped Hispanic people in California and encouraged them to vote. In 1962 Chavez and Dolores Huerta founded a labor union called the National Farm Workers Association. In 1971 the union became known as the United Farm Workers of America (UFW).

Chavez led protests to call attention to the problems of migrant workers. In the mid-1960s he launched a strike by California grape pickers that lasted five years. During the strike Chavez got

people across the country to stop buying California grapes. By 1970 most grape growers had signed contracts that improved wages and benefits for their workers. Chavez also led battles against lettuce growers and other farm businesses. Chavez served as president of the UFW until his death on April 23, 1993.

► More to explore

Hispanic Americans • Labor

Cheetah

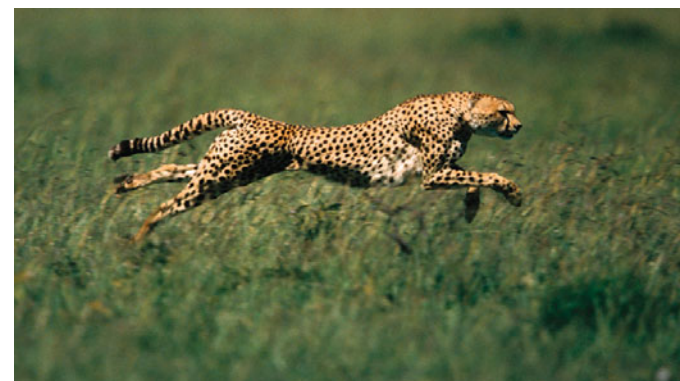
The cheetah is the fastest land animal on Earth. This spotted member of the cat family can sprint faster than 70 miles (112 kilometers) per hour. The cheetah's scientific name is *Acinonyx jubatus*.

Where Cheetahs Live

Cheetahs live in the wild in scattered parts of central, eastern, and southern Africa. A small number of wild cheetahs live in Iran. Most cheetahs live in grasslands and dry, open areas.

Physical Features

Small black spots cover most of the cheetah's sandy yellow fur. The belly is white, and the tail is marked with dark



A cheetah sprints through the grass in Kenya.

rings. Black lines run from the eyes to the corners of the mouth.

The cheetah measures about 6.5 feet (2 meters) long, from the head to the tip of the tail. It is a slender mammal that weighs about 75 to 120 pounds (34 to 54 kilograms). Males tend to be larger than females.

A cheetah's body is built for speed. Long legs allow the cheetah to take big strides. Hard paws and exposed claws help it to grip the ground. The cheetah is the only kind of cat that cannot pull its claws completely back.

Behavior

Cheetahs live alone or in small groups. They hunt small animals, mainly during the day. After creeping up on an animal, a cheetah sprints at it from a few hundred feet away. The cheetah can keep up the chase for only a short time before tiring. When the cheetah does catch its prey, it trips the animal and bites into it.

Life Cycle

About three months after mating, a female cheetah gives birth to two to eight cubs. Cheetah cubs stay with their mother for more than a year while they learn to hunt. Some cheetahs in zoos have reached the age of 19, but most do not live that long.

Cheetahs and Humans

The ancient Egyptians and some rulers of India and Europe tamed cheetahs. They used the animals for hunting. Other

peoples hunted cheetahs for their fur. Eventually, wild cheetahs disappeared from India and many other places. Today cheetahs are in danger of dying out completely. Human settlements have taken over much of their land.

► More to explore

Cat • Endangered Species • Mammal

Chemical Element

A chemical element is a basic substance. It cannot be broken down into simpler substances by ordinary chemical processes. Chemical elements are the building blocks for all matter—that is, everything that takes up space in the universe. They are sometimes just called elements.

There are 92 chemical elements found in nature. Scientists have created more than 20 additional elements. Some elements are much more common than others. One common element is nitrogen. It is the major element in air. The elements combine to form substances called chemical compounds. For example, water is a chemical compound. It is formed by the combination of the elements hydrogen and oxygen.

Element Symbols

Every element has a symbol. The symbol for some elements is the first letter of its name. For example, H is the symbol for hydrogen and O is the symbol for oxygen. Other elements have a symbol with

Did You Know?

Only two chemical elements are liquid at room temperature. They are bromine (Br) and mercury (Hg).

Periodic Table of the Elements																			
1a																	zero		
<div>1 H</div>																	<div>C carbon</div>	<div>O oxygen</div>	<div>2 He</div>
<div>3 Li</div>	<div>4 Be</div>											<div>Ag silver</div>	<div>5 B</div>	<div>6 C</div>	<div>7 N</div>	<div>8 O</div>	<div>9 F</div>	<div>10 Ne</div>	
<div>11 Na</div>	<div>12 Mg</div>	IIIb	IVb	Vb	VIb	VIIb	← VIIIb →		IB	IIb	<div>Au gold</div>	<div>13 Al</div>	<div>14 Si</div>	<div>15 P</div>	<div>16 S</div>	<div>17 Cl</div>	<div>18 Ar</div>		
<div>19 K</div>	<div>20 Ca</div>	<div>21 Sc</div>	<div>22 Ti</div>	<div>23 V</div>	<div>24 Cr</div>	<div>25 Mn</div>	<div>26 Fe</div>	<div>27 Co</div>	<div>28 Ni</div>	<div>29 Cu</div>	<div>30 Zn</div>	<div>31 Ga</div>	<div>32 Ge</div>	<div>33 As</div>	<div>34 Se</div>	<div>35 Br</div>	<div>36 Kr</div>		
<div>37 Rb</div>	<div>38 Sr</div>	<div>39 Y</div>	<div>40 Zr</div>	<div>41 Nb</div>	<div>42 Mo</div>	<div>43 Tc</div>	<div>44 Ru</div>	<div>45 Rh</div>	<div>46 Pd</div>	<div>47 Ag</div>	<div>48 Cd</div>	<div>49 In</div>	<div>50 Sn</div>	<div>51 Sb</div>	<div>52 Te</div>	<div>53 I</div>	<div>54 Xe</div>		
<div>55 Cs</div>	<div>56 Ba</div>	<div>57 La</div>	<div>72 Hf</div>	<div>73 Ta</div>	<div>74 W</div>	<div>75 Re</div>	<div>76 Os</div>	<div>77 Ir</div>	<div>78 Pt</div>	<div>79 Au</div>	<div>80 Hg</div>	<div>81 Tl</div>	<div>82 Pb</div>	<div>83 Bi</div>	<div>84 Po</div>	<div>85 At</div>	<div>86 Rn</div>		
<div>87 Fr</div>	<div>88 Ra</div>	<div>89 Ac</div>	<div>104 Rf</div>	<div>105 Db</div>	<div>106 Sg</div>	<div>107 Bh</div>	<div>108 Hs</div>	<div>109 Mt</div>	<div>110 Ds</div>	<div>111 Rg</div>	<div>112 Cp</div>	<div>113 (Uut)</div>	<div>114 (Uuq)</div>	<div>115 (Uup)</div>	<div>116 (Uuh)</div>		<div>118 (Uuo)</div>		
lanthanide series			<div>58 Ce</div>	<div>59 Pr</div>	<div>60 Nd</div>	<div>61 Pm</div>	<div>62 Sm</div>	<div>63 Eu</div>	<div>64 Gd</div>	<div>65 Tb</div>	<div>66 Dy</div>	<div>67 Ho</div>	<div>68 Er</div>	<div>69 Tm</div>	<div>70 Yb</div>	<div>71 Lu</div>			
actinide series			<div>90 Th</div>	<div>91 Pa</div>	<div>92 U</div>	<div>93 Np</div>	<div>94 Pu</div>	<div>95 Am</div>	<div>96 Cm</div>	<div>97 Bk</div>	<div>98 Cf</div>	<div>99 Es</div>	<div>100 Fm</div>	<div>101 Md</div>	<div>102 No</div>	<div>103 Lr</div>			

The periodic table groups elements by their properties.

two letters. For example, He is the symbol for helium and Cl is the symbol for chlorine.

Elements and Atoms

The smallest unit of an element is called an atom. Each element is made up of only one type of atom. Atoms, in turn, are made up of tiny particles, or bits, called protons, neutrons, and electrons. All atoms of an element have the same number of protons. This number is called the atomic number of the element. For example, the atomic number of hydrogen is 1 because a hydrogen atom has one proton.

Periodic Table

In 1869 a Russian scientist named Dmitry Mendeleev grouped the elements in a table. It is called the periodic table. The periodic table arranges the elements in rows and columns. In the

rows, the elements are placed in order of their atomic number. The columns form groups of elements that have similar chemical properties. The periodic table helps chemists think about the elements and their properties.

► More to explore

Atom • Matter

Chemistry

Chemistry is one of the major branches of science. People who work in chemistry are called chemists. Chemists study the substances that make up matter—everything that takes up space in the universe. They also study the changes that take place when substances are combined. These changes are called chemical reactions.

In addition, chemists create new substances. They have made plastics, fibers,



Students of chemistry learn about the substances that make up matter. They also study the changes that take place during chemical reactions.

building materials, medicines, and many other substances that are useful in everyday life.

Elements and Compounds

The basic substances that chemists study are called chemical elements. Each element is made up of tiny particles, or bits, called atoms. Chemical reactions involve atoms or groups of atoms. When two or more atoms combine, they form a molecule.

Each element has certain properties, or characteristics. When elements are combined, they form a new substance with its own properties. A substance formed in this way is called a compound. There are a little more than 100 elements. But there are millions of compounds.

Fields of Study

Chemistry is a complex subject with many fields of study. For example, organic chemists deal only with compounds of the element carbon. Physical chemists measure the way that substances change during chemical reactions. Biochemists study chemical processes that happen in living things.

History

People first studied chemistry as a science in the 1600s. In 1661 a British scientist named Robert Boyle described chemical elements as simple, basic substances. In the 1770s a French chemist named Antoine Lavoisier helped to explain chemical reactions.

In the early 1800s a British chemist named John Dalton found that each element has its own kind of atom. Other chemists discovered many new elements during the 1800s.

Later chemists continued to make discoveries about atoms. For example, they learned that atoms are made up of even simpler particles.

► More to explore

Atom • Chemical Element • Matter
• Molecule

Did You Know?

People called alchemists worked with chemicals before chemistry became a science. They tried to change lead into gold. They failed, but they learned about elements in the process.

Cherokee

The Cherokee are the largest Native American group in the United States. They once lived around the Great Lakes. After battles with other tribes, they moved to what is now the southeastern



Cherokee dancers perform at a Native American celebration.

United States. Today they live mostly in Oklahoma.

The Cherokee traditionally grew corn, beans, and squash. They hunted deer, bear, and elk. They lived in log cabins with roofs made of bark.

Europeans arrived in Cherokee territory in the middle of the 1500s. By that time the Cherokee lived in the Southeast. Over the next 200 years the Cherokee lost much of their land and power to white settlers.

After 1800 the Cherokee took on some parts of white culture. They formed a government based on that of the United States. A man named Sequoyah created a writing system for the Cherokee language. Most Cherokee learned to read and write. Whites called the Cherokee one of the Five Civilized Tribes, along with the Choctaw, the Seminole, the Chickasaw, and the Creek.

In the 1830s gold was discovered on Cherokee land in Georgia. Georgia offi-

cials and the U.S. government forced the Cherokee to leave their land and march west. About 4,000 Cherokee died on the journey, which is called the Trail of Tears.

Most Cherokee settled in what is now northeastern Oklahoma. Their descendants still live there. Some Cherokee live in western North Carolina. They are descendants of Cherokee who escaped into the mountains in the 1830s. In the late 20th century there were more than 280,000 Cherokee living in the United States.

► More to explore

Chickasaw • Choctaw • Creek • Native Americans • Seminole • Sequoyah • Trail of Tears

Cherry



Cherries grow on stems that hang from tree branches.

Cherries are small, round fruits that can be sweet or sour. They grow on trees

that are common in North America, Europe, and eastern Asia.

Different types of cherry tree produce sweet cherries and sour cherries. Sweet-cherry trees are large, reaching heights up to 36 feet (11 meters). Their fruit is usually round or heart-shaped. Sweet cherries vary in color from yellow to red to nearly black. People eat sweet cherries fresh or canned.

Sour-cherry trees are smaller than sweet-cherry trees. They are usually less than 16 feet (5 meters) tall. Sour cherries are round and smaller than sweet cherries. They are usually dark red. Sour cherries are not eaten fresh because of their sour taste. They are frozen or canned and used in sauces and pastries, such as cherry pie.

Some kinds of cherry tree do not bear fruit. But people like these trees for the beautiful pink and white flowers they bear. Many cherry trees are planted in gardens and parks, especially in Japan.

The wood of cherry trees is valued for its rich red color. People use cherry wood to make cabinets, furniture, and other products.

► More to explore

Fruit

Chestnut

Chestnuts are tall trees that produce sweet-tasting nuts and useful wood. There are four species, or types, of chestnut tree: American, European, Chinese,



Tall chestnut trees provide welcome shade to an avenue.

and Japanese. They are related to oak and beech trees.

Chestnut trees can grow to a height of about 100 feet (30 meters). The bark has deep grooves. The leaves are shiny green and oval-shaped with pointed edges. The nuts are found inside green, cup-shaped structures with a spiky shell. Each holds two or three nuts.

The American chestnut tree was once common in eastern North America. However, in the 1900s a disease called chestnut blight killed almost all the American chestnuts. The blight also attacks the European chestnut. It does not affect Chinese or Japanese chestnuts.

Some of the trees called chinquapins are closely related to the chestnuts. But their fruits contain only one nut. Other plants that are called chestnuts are not related to the true chestnuts. These include horse chestnut trees, which bear nuts that are not usually eaten. Water

chestnuts are water plants that produce a nutlike fruit.

► More to explore

Nut • Oak • Tree

Cheyenne



Members of the Cheyenne tribe of Native Americans perform at a festival in Washington, D.C.

The Native American people known as the Cheyenne originally were farmers. Later, however, they became traveling bison (buffalo) hunters. They spoke an Algonquian language.

Before 1700 the Cheyenne lived in the upper Mississippi River valley, in what is now Minnesota. There they farmed, gathered wild rice, and made pottery. They later moved west to what is now North Dakota. It was probably there that they first got horses, which changed their way of life. The Cheyenne began to hunt bison on horseback. They ate bison meat, used the bones for tools, and made clothing and tepees from the skins. To follow the herds, the Cheyenne gradually

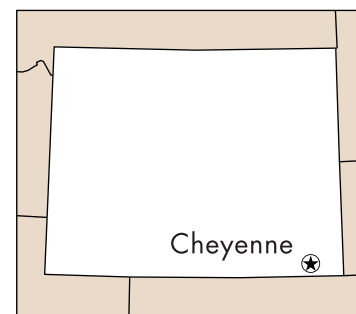
abandoned their villages and gave up farming.

The Cheyenne eventually spread across much of the Great Plains. In the 1830s many Cheyenne moved south to what is now Colorado. The tribe divided into northern and southern branches. The Northern Cheyenne continued to roam the plains, but the Southern Cheyenne chose a more settled lifestyle. From the 1850s through the 1870s the Cheyenne fought with U.S. soldiers and settlers heading west. At the end of the 20th century the Cheyenne population was about 11,000, mostly in Oklahoma and Montana.

► More to explore

Algonquian • Native Americans

Cheyenne



Population
(2000 census)
53,011; (2007
estimate)
55,641

Cheyenne is the capital of the U.S. state of Wyoming. Many people in the city work for the government. Many others work in health care, banking, and tourism. Factories in Cheyenne process oil and make chemicals.

Cheyenne was founded in 1867. It was named after the Cheyenne Indians, who lived in the area. The site was a station on the first railroad to cross the United



The state Capitol in Cheyenne, Wyoming, stands in a grassy park.

States. Many of the first residents of Cheyenne went there to help build the railroad. Cheyenne became the capital of the Wyoming territory in 1869. The territory became a state in 1890.

Cheyenne was an outpost of the Wild West. Cowboys drove cattle north from Texas to the railroad at Cheyenne. Cattle were also raised on nearby ranches. In the 1870s Cheyenne became a supply center for the area's gold miners. Gunfighters, gamblers, and other colorful characters roamed the city.

Today Cheyenne takes pride in its Old West heritage. Every July the city holds a famous rodeo.

► More to explore

Cheyenne • Wyoming

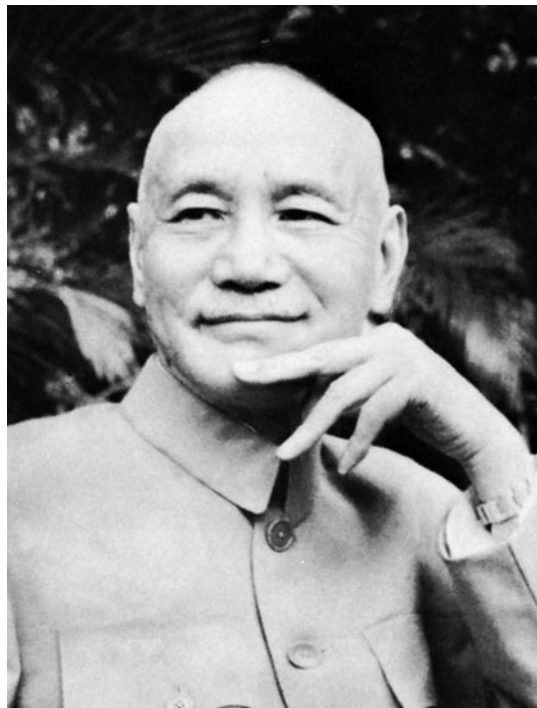
Chiang Kai-shek

The Chinese leader Chiang Kai-shek helped to overthrow the last emperor of China. He later fought for control of the country as head of the Nationalist Party.

Chiang Kai-shek was born on October 31, 1887. He studied military science in Tokyo. There he became a follower of the Chinese revolutionary leader Sun Yat-sen.

Chiang returned to China in 1911. He took part in a revolution that overthrew the ruling Qing, or Manchu, Dynasty and made China a republic. However, for several years after that there was no stable government as military warlords struggled for power.

After a period of study in the Soviet Union, Chiang returned to China in 1923. Two years later he followed Sun as head of the Kuomintang (Nationalist Party). During this period Communists were part of the Nationalist Party, but in 1927 Chiang forced the Communists to leave. He also moved against the warlords and in 1928 established a new government. The warlords as well as the



Chiang Kai-shek

Communists continued to oppose him, however.

When Japan invaded China in 1937, Chiang formed a temporary alliance with the Communists to fight the invaders. Their fight became part of the larger conflict of World War II. After the Japanese surrendered in 1945 the Communists moved against Chiang again. By 1949 they had defeated him and established the People's Republic of China. Chiang moved his Nationalist government to the island of Taiwan. He died on April 5, 1975.

► More to explore

China • Sun Yat-sen • Taiwan

Chicago



Population
(2000 census),
city, 2,896,016;
(2007 estimate)
2,836,658

Chicago, Illinois, is the third largest city in the United States. Only New York City and Los Angeles, California, have more residents. Chicago is a center of industry, transportation, culture, and education. The modern skyscraper was born in Chicago. The city has some of the world's tallest buildings, including



Visitors to Chicago's Millennium Park can see a giant reflecting sculpture by Anish Kapoor. The pieces of curled metal in the background are part of a music pavilion designed by the architect Frank Gehry.

the Willis Tower (formerly called the Sears Tower) and the John Hancock Building.

Chicago is in the Midwest region of the United States. The city lies on Lake Michigan, one of the five Great Lakes. Beaches and parks line the lakefront.

Culture

The arts are a significant part of life in Chicago. The city has many museums and theater companies. The Chicago Symphony Orchestra and the Art Institute of Chicago are world famous. Outdoor concerts, including large blues and jazz festivals, are held at Grant Park and Millennium Park.

Sports are also important to city life. Chicago's devoted fans cheer on the Cubs and White Sox (baseball), the Bulls (basketball), the Blackhawks (hockey), and the Bears (football).

Economy

Chicago's economy is based on many different industries and services. Many people in the city work for the government or in banking, trade, or tourism. The major industries include food processing, publishing, and making paper products, electronics, and chemicals.

History

Native Americans were the first people to live in the Chicago area. A black trader named Jean-Baptist-Point du Sable settled in the area in the 1770s. A U.S. fort and a settlement were later established there.

Chicago's industries and population grew rapidly in the 1800s. Its location on Lake Michigan and in the middle of the country helped it become a center of trade and transportation.

In 1871 a terrible fire destroyed about a third of Chicago. The city rebuilt

quickly, however. Many skyscrapers soon sprang up downtown. In 1893 Chicago hosted a huge fair called the World's Columbian Exposition. More than 21 million people visited the fair.

In the 1900s many Chicago residents moved to the suburbs. Starting in the 1990s, however, building projects brought new life to the city.

► More to explore

Du Sable, Jean-Baptist-Point

• Michigan, Lake • Skyscraper

Chickasaw

The Chickasaw are a Native American tribe that originally lived in what is now the southeastern United States. Their traditional homeland was centered in what is now northern Mississippi, but it also included parts of what are now Alabama, Tennessee, and Kentucky.



Chicago has some of the world's tallest buildings. They are close to the shoreline of Lake Michigan.



The Chickasaw made rattles for religious purposes. They used such natural materials as turtles' shells, cows' horns, and gourds.

The Chickasaw built their houses by covering a pole frame with grass, bark, or hides. They spread the houses out along riverbanks instead of clustering them in villages. They got their food by farming and hunting.

In the 1540s the Spanish explorer Hernando de Soto and his men met the Chickasaw. The Chickasaw drove the explorers from their territory. The tribe was more welcoming to English traders who arrived in the 1700s. The Chickasaw often sided with the English in their battles with French traders and settlers.

The relationship between the Chickasaw and the United States became strained when Americans began moving into their territory. In the 1830s the U.S. government forced the Chickasaw to move to Indian Territory (now Oklahoma) along with the Creek, the Cherokee, the Choctaw, and the Seminole. Because they adopted certain European

customs, these tribes came to be known as the Five Civilized Tribes. In 1855 the Chickasaw established a separate nation. In 1907 the Chickasaw Nation became part of Oklahoma. There are now about 20,000 Chickasaw in the United States. About half still live in Oklahoma.

► More to explore

Cherokee • Choctaw • Creek • Native Americans • Seminole

Chicken

The chicken is a bird that people all over the world raise for its meat, eggs, and feathers. It belongs to the group of domesticated, or tame, birds called poultry.

Chickens have short wings and a heavy body. This makes it hard for them to fly very far. Male chickens are called roosters. Roosters often have brightly colored feathers. They can be red, green, brown,



Male chickens are called roosters. They do not lay eggs.

black, or other colors. Female chickens are called hens. Hens are usually brown or white. Both males and females have one or two wattles. A wattle is skin that hangs from the throat. Male and female chickens also have a comb, which is skin that sticks up from the top of the head.

Farmers usually keep chickens inside large, modern buildings. They feed the birds corn and other grains. Some farmers allow their chickens to roam free outdoors. These chickens usually roost, or sleep, inside at night.

Hens can lay more than 200 eggs a year. If a hen mates with a rooster before laying eggs, the eggs will be fertilized. This means that they will develop into chicks. But hens can lay eggs without mating. These unfertilized eggs are the eggs that people eat.

Wild birds called jungle fowl are the ancestors of chickens. Jungle fowl belong to the pheasant family. They live in parts of Asia, including India. Jungle fowl eat seeds, fruit, and insects. They fly into trees to escape from predators.

► More to explore

Bird • Egg • Poultry

Chicken Pox

One of the most common diseases of childhood is chicken pox. Although most people contract it between the ages of 2 and 6, chicken pox can strike at any age. It is a fairly mild illness in children, but it can be serious in adults.



Itchy, red spots on the face and body are a sign of chicken pox.

The first symptoms, or signs of the disease, include a slight fever, runny nose, and mild cough. The person will not feel hungry and may also have headaches and feel tired.

Roughly two weeks after being exposed to the virus that causes the disease, red spots appear on the face and body. These spots are filled with fluid, and they itch terribly. Eventually the spots form scabs, which soon fall off.

People with chicken pox should try not to scratch the spots. The itching can be relieved by using medications such as calamine lotion. It is important to keep the spots clean.

It is extremely important to never use aspirin to treat the headaches and body aches that accompany chicken pox. Using aspirin to treat chicken pox has been connected to the development of a severe disease called Reye's syndrome.

A case of chicken pox generally lasts from a week to 10 days. Because chicken

Did You Know?

The virus that causes chicken pox stays in the body after the disease goes away. It can break out years later as a disease called shingles.

pox is easily passed from one person to another, it is important for a person with the disease to remain in bed until the scabs have fallen off. Scientists developed a chicken pox vaccine, or substance that protects people from getting the disease, in the late 20th century.

► **More to explore**

Reye's Syndrome • Vaccine

Child Development

People live much longer than most other animals, so human childhood also lasts a long time. Unlike baby animals, human children need many years to learn how to live on their own as adults. As children's bodies grow, so do their minds. This growth is called child development. People who study child development learn how children change, from the time they are infants until they become teenagers, or adolescents.



Infants enjoy holding and looking at toys and other objects.



Children learning to walk need support to help them keep their balance.

There are several stages of child development. Babies go from being infants to toddlers to preschoolers. Then they enter school at 5 or 6 years old. At around 9, children are called preadolescents, or preteens. This last stage continues until a child becomes a teenager.

Infancy

Infancy is the most helpless stage of a human being's life. It takes an infant about three months just to grow strong enough to hold up its head. As their muscle strength increases, babies can do more. Over their first year infants gradually learn to roll over, sit up, crawl, and take their first steps with someone helping them. They become better at using their hands to grasp and hold things. As they grow out of infancy, babies begin to make sounds similar to words.

Toddlerhood

The toddler stage begins when a baby starts to walk, usually at about age 1. Most children also start saying words at about this time. As toddlers grow they become stronger and have more control of their bodies. Their thinking skills also improve. They slowly start putting words together to make sentences. They like to copy what other people say and do.

Preschool Age

Between ages 3 and 5, children are in the preschool stage. Children learn many important skills during this stage. They learn to share and to take turns. They learn how to play simple games with rules, such as tag. Playing with others helps them learn how to get along with all kinds of people.

School Age

Starting school marks a new stage. Children's minds develop quickly as they learn reading, writing, and arithmetic. They also learn more about cooperating with others. As their bodies grow stron-



Play is an important part of preschool children's development.

ger and more coordinated, many school-age children try sports or other difficult physical activities.

Preteen Years

Between 9 and 12 years old, children are preteens, or preadolescents. During this stage they grow much more independent. They become better at controlling their behavior. Preteens also understand how to be helpful to others.

During the preteen years children form close friendships. Their group of friends becomes very important to them. Family is no longer a central part of their life. Preteens also become more aware of the world beyond their home, school, and community.

The end of the preadolescent years marks the end of childhood. As preteens become teenagers, they move one step closer to becoming adults and living on their own.

► More to explore

Adolescence



Preteen children learn how to work together in activities such as music and sports.



Chile

The Republic of Chile stretches for nearly 2,700 miles (4,350 kilometers) along the west coast of South America. Though long, it has an average width of only 110 miles (180 kilometers). Its capital and largest city is Santiago.

Geography

The Pacific Ocean forms Chile's western border. Peru, Bolivia, and Argentina lie to the north and east. Chile claims a piece of Antarctica. It also controls several islands in the South Pacific, including Easter Island.



The Andes Mountains are in the east. Smaller mountain ranges are in the west. Flat plains lie between the two mountain systems. The mountains and plains run from north to south for nearly the entire length of the country.

The northern part of Chile is a very dry desert with moderate temperatures. The center of the country has hot, dry summers and cool, moist winters. Southern Chile is cold and wet.

Plants and Animals

Cacti and prickly shrubs grow on the northern coast. Hardwood trees, shrubs, cacti, and green grass grow in central Chile, though farmland has replaced many of the native plants there. Dense forests of beeches, evergreens, and monkey puzzle trees (Chile pines) cover the south.

Guanacos, llamas, alpacas, and vicuñas live in the northern Andes. Other mountain animals include deer, wolves, pumas, wildcats, rodents, and condors. The southern forests are home to foxes, small deer, and marsupials.

People

Most Chileans are mestizos, or people with both Spanish and American Indian roots. There are smaller groups of whites and Araucanian Indians. Most of the people speak Spanish and are Roman Catholic. Most Chileans live in cities in the central part of the country.



Folk music and dance are popular in Chile.

Economy

Banking and other services, manufacturing, mining, fishing, and trade are Chile's most important economic activities. The country produces and sells food products, metals, chemicals, and paper. Chile is the world's leading producer of copper. Chilean farmers grow wheat, grapes, apples, vegetables, and other crops.

History

Before the Spanish arrived in 1536, at least 500,000 American Indians lived in what is now Chile. The Araucanian Indians fought against the settlers for about 350 years. Meanwhile, the Span-

ish set up huge farming estates. A small class of people controlled most of the land, the wealth, and the political life of the country.

In the early 1800s Chile began fighting Spain for independence. Chile defeated Spain in 1817 and became independent in 1818. But Chile's wealthy landowners continued to dominate politics.

In the early 1900s many people demanded changes in government and society. A new constitution in 1925 gave Chile democratic elections and social programs. After a shaky start, Chile's government remained stable until the 1970s.

In 1973 the military overthrew President Salvador Allende. General Augusto Pinochet took power. Pinochet's government jailed, tortured, and killed many people who opposed it. In 1988 Pinochet allowed the people to vote on whether he should stay in office. They rejected him by a small majority. Elections in 1989 returned Chile to civilian (nonmilitary) rule.

► More to explore

Andes • Santiago



Laguna Miscanti and the Atacama Desert lie in the northern part of Chile.

Facts About CHILE



Population
(2008 estimate)
16,454,000

Area
291,930 sq mi
(756,096 sq km)

Capital
Santiago

Form of government
Republic

Major cities
Greater Santiago, Puente Alto, Concepción, Viña del Mar, Antofagasta, Valparaíso

Chimpanzee

Chimpanzees are apes that are closely related to bonobos—and to human beings. In fact, chimpanzees and bonobos are the closest living relatives of humans. Chimpanzees are very smart and social animals. They belong to the group of mammals called primates.

Where Chimpanzees Live

Chimpanzees are found in western, central, and eastern Africa. Most of them live in rain forests. But some chimpanzees live in drier grasslands and other areas.

Physical Features

Chimpanzees are usually about 3 to 5.5 feet (1 to 1.7 meters) tall. They generally weigh about 70 to 130 pounds (32 to 60 kilograms). The males are somewhat larger than the females. Chimpanzees'



The West African, or masked, chimpanzee is an endangered species. This means that it is in danger of dying out.

arms are longer than their legs. They have coats of brown or black hair. But their faces, large ears, hands, and feet are bare.

Behavior

Chimpanzees eat mainly plants, including fruits, leaves, and seeds. They also eat insects and birds' eggs. Sometimes chimpanzees hunt and eat monkeys and other mammals.

On the ground chimpanzees can walk upright on two legs. But more often they lean on their knuckles and walk on all fours. Chimpanzees spend time both in trees and on the ground.

Chimpanzees make and use a variety of simple tools. For instance, some chimpanzees chew certain leaves to make them spongy. Next, they push the leaves into tree hollows filled with water. They use sticks to get their leaf-sponges back out. Finally, they drink the water from the leaves. Young chimpanzees probably learn how to use tools by watching and imitating adults.

Chimpanzees live in groups of about 15 to 120 individuals, led by a male. They communicate with each other using facial expressions, gestures, and sounds. Members of a group are generally friendly toward each other but unfriendly to other groups. Sometimes one group will attack a smaller group and try to take its land.

► More to explore

Ape • Bonobo • Primate

China

More than one fifth of all the people in the world live in China. The country is also the largest in Asia. China's capital is Beijing.

Geography

China shares borders with Mongolia, Russia, North Korea, Vietnam, Laos, Myanmar, India, Bhutan, Nepal, Pakistan, Afghanistan, Tajikistan, Kyrgyzstan, and Kazakhstan. The Yellow, East China, and South China seas lie to the east. The Himalayan, Karakoram, and Altai mountain ranges separate China from its neighbors to the west.

The Plateau of Tibet in the southwest is a cold, mountainous region. The northwest is a highland with large desert basins. The east holds almost all of China's lowlands. China's major rivers are the Huang He, the Yangtze, and the Xi.

Plants and Animals

Forests cover about 15 percent of China's land. Among the many trees are tung, camphor, lacquer, and star anise trees. Mangrove swamps are found along the South China Sea. Rain forests grow in parts of southern China.

Giant pandas, Chinese paddlefish, and giant salamanders live in the wild only in China. Other animals and birds include tigers, monkeys, alligators, pheasants, and laughing thrushes.

People

The Han, or the ethnic Chinese, make up more than 90 percent of the population. Mandarin, a type of Han Chinese, is the official language. China has about 55 minority groups. For many years the government discouraged religion, but that began to change in the late 20th





Xiling Gorge is a part of the Three Gorges region of China's Yangtze River. A huge dam in the area has caused the water in the gorge to rise greatly.

Facts About CHINA



Population
(2008 estimate)
1,324,681,000

Area
3,696,100 sq mi
(9,572,900 sq
km)

Capital
Beijing

**Form of
government**
People's republic

Major cities
Shanghai,
Beijing, Tianjin,
Guangzhou, Wu-
han, Chongqing,
Shenyang

century. Today many people follow traditional Chinese beliefs. Growing numbers practice Buddhism, Christianity, and Islam.

About 38 percent of the people live in cities. More than 40 cities have at least 1 million residents. The government has tried to control the growing population by asking families to have only one child.

Economy

China's Communist government once owned most of the businesses and farms in the country. Today individuals are allowed to own businesses. As a result the economy is growing steadily.

Mining and manufacturing are the most important economic activities. Mines produce zinc, lead, copper, iron ore, coal, and other minerals. Factories make cement, steel, iron, paper, chemicals, fabrics, electronic products, household

appliances, and cars. Service industries, including finance and health care, are becoming increasingly important.

Agriculture is a smaller part of the economy. However, it employs the largest number of workers. China is the world's top producer of rice. It also produces corn, wheat, soybeans, peanuts, fruits, vegetables, tobacco, cotton, pigs, and chickens.

History

Human ancestors lived in what is now China at least 400,000 years ago. By about 2000 BC people began living in settled groups and farming. Eventually those groups formed communities and then dynasties, or royal families, to rule over the communities.

Dynasties

The first dynasty for which there are written records was the Shang. It took

power over part of China in the 1700s BC. The Shang created bronze tools and written documents. Their neighbors, the Zhou, took over their territory in about 1050 BC. The Zhou Dynasty ruled a loose collection of states. The leaders of one of those states, the Qin, unified China in 221 BC. The Qin began to construct the Great Wall of China, which was more than 4,000 miles long.

From 202 BC to AD 1279, the Han, Sui, Tang, and Song dynasties ruled China. During that time the Chinese made advances in science, literature, and the arts. China also expanded its territory to include parts of Korea, Vietnam, Mongolia, and Tibet.

Foreign Invasions

The Mongols of Central Asia conquered all of China in 1279. It was the first time in history that foreign invaders had controlled the Chinese empire. The Ming Dynasty overthrew the Mongols in 1368. Another group, the Manchus,



Lanterns and flags decorate the old city wall of Xi'an, China.

took over as the Qing Dynasty in 1644. The Qing Dynasty continued until 1912. It was China's last dynasty.

Meanwhile, conflict with the West began with the first Opium War (1839–42). The British ran a profitable opium (a type of drug) trade in China. Many Chinese citizens became addicted to opium, and China wished to halt the trade. However, the British won the war as well as other battles. In the late 1800s



TIMELINE

The Shang Dynasty takes power over part of China.

1700s BC

The Mongols conquer China.

AD 1279

The Nationalists make China a republic.

1912

Mao Zedong begins the Cultural Revolution.

1966

The Qin Dynasty unites China.

221 BC

The native Ming Dynasty defeats the Mongols.

1368

The Communists form the People's Republic of China.

1949



The Forbidden City in China's capital city of Beijing contains the palaces of several former emperors. It is now a museum that is open to the public.

China also had disputes with France, Russia, and Japan.

Many in China disliked the growing foreign involvement. Many were also angry about poverty in the countryside. People around the country began to rebel. In the Boxer Rebellion of 1900, bands of Chinese attacked and killed at least 250 foreigners. After European, Russian, U.S., and Japanese forces put down the rebellion, those foreign powers gained even more control over China.

Chinese Revolution

Several Chinese groups continued to fight for change in the Qing Dynasty's weak government. They finally succeeded with a revolution that began in 1911. The last Qing emperor stepped down in 1912. Sun Yat-sen and his Kuomintang (Nationalist Party) declared China a republic. For several years, however, different leaders fought for control of China.

Did You Know?

Archaeologists have found decorated pottery that was created in China about 12,000 years ago.

Communism

In 1928 the Nationalists, a group led by Chiang Kai-shek, took control of China. During invasions by Japan in the 1930s and World War II (1939–45), however, the Chinese Communist Party grew strong. Civil war broke out between the Nationalists and the Communists, led by Mao Zedong. In 1949 the Communists defeated the Nationalists.

The Communists renamed the country the People's Republic of China. They set up a Communist government with Mao Zedong as its leader. In 1958 Mao started a program, called the Great Leap Forward, to modernize China's economy. The plan failed, however, and many people died of starvation. In 1966 Mao began the Cultural Revolution. Its goal was to strengthen people's belief in Communism. Instead it led to disorder and violence. Mao closed China's schools and encouraged young people to attack those who disagreed with him.

Recent Events

After Mao died in 1976, the Communist government began to relax its tight hold on Chinese society. Later leaders allowed private businesses and some freedom of speech. China also tried to improve relations with other countries. One sign of the country's success came in 2001. In that year the International Olympic Committee chose Beijing to host the 2008 Summer Olympic games.

► More to explore

Beijing • Chiang Kai-shek
• Communism • Great Wall of China
• Huang He • Mao Zedong

Chinese New Year

Chinese New Year is a major holiday in China and Chinese communities throughout the world. Unlike in Western nations, the starting date of the Chinese New Year is not the same each year. It begins in late January or early February. The 15-day celebration begins with the new moon and lasts until the full moon.

Firecrackers are often shot off on New Year's Eve. Fireworks celebrate the end of the old year and the beginning of the new year. Chinese New Year is a time to feast and to visit family members. Many traditions of the season honor relatives who have died.

The last event of the 15-day celebration is the Lantern Festival. People often

hang glowing lanterns in temples or carry them during a nighttime parade. The dragon dance highlights festival celebrations in many areas. A long, colorful dragon is carried through streets by numerous dancers.

Chinese years are named after 12 animals: rat, ox, tiger, hare, dragon, snake, horse, sheep, monkey, fowl, dog, and pig. Chinese New Year marks the start of the next animal's year—for example, the Year of the Pig. After 12 years, the cycle of animals repeats itself.

Chipewyan

The Chipewyan are a tribe of Native Americans who once survived by hunting caribou in Canada. They ranged through the southern parts of what are now Nunavut and the Northwest Territories. Their range also included the northern parts of Alberta, Saskatchewan, and Manitoba.

The Chipewyan traveled in small bands and followed the caribou's migrations. Caribou were their main source of food. They also made clothing, tents, and nets from caribou skins. The Chipewyan did not farm but gathered food from plants that were growing wild.

Following the arrival of European fur traders in the late 1600s, the Chipewyan began to hunt for fur animals to exchange for European goods. The Europeans also introduced the Chipewyan to new diseases such as

Did You Know?

The Chipewyan religion included belief in dreams, visions, and guardian spirits.



Dancers in a Chinese New Year parade carry a bright and festive dragon.



A photograph from the 1920s shows a group of Chipewyan in front of a teepee.

smallpox. In 1781 an epidemic of smallpox killed most of the Chipewyan population.

The Chipewyan were further hurt by the decline of the fur trade in the 1800s. They eventually surrendered much of their land to the Canadian government and settled onto several small reserves in Alberta, Saskatchewan, Manitoba, and the Northwest Territories. By the end of the 20th century, there were about 5,000 Chipewyan living in Canada.

► More to explore

Americas, Exploration and Settlement of the • Native Americans

Chipmunk

Chipmunks are rodents that are closely related to squirrels. They look like squirrels but are smaller. Plus, chipmunks have stripes on their back, while squirrels do not.

There are 25 species, or types, of chipmunk. All species live in North America except for the Asiatic chipmunk. It is found in northern Asia and eastern Europe. Chipmunks live in many places, including woodlands, mountains, and plains.

Chipmunks are small. The eastern chipmunk is 5.5 to 7.5 inches (14 to 19 centimeters) long. Its bushy tail is more than half as long as its body. It weighs only about 2.5 to 5 ounces (71 to 142 grams). The western and Asiatic chipmunks are even smaller.

Chipmunks have different colors and stripes. The eastern chipmunk is reddish brown. It has five dark stripes on its back. Between the dark stripes are two brown and two white stripes. The gray western chipmunk has five dark stripes and four light stripes.

Most chipmunks are good tree climbers and swimmers. They eat nuts, seeds, wild fruits, and berries. Inside their cheeks are pouches. Chipmunks stuff these pouches with food to carry home.



The reddish brown eastern chipmunk lives in the forests of eastern North America.

Each chipmunk has its own burrow, or hole. It contains at least two rooms. One is a storeroom for nuts. The other is a leaf-lined nest. Chipmunks sleep during most of the winter.

► More to explore

Rodent • Squirrel

Chippewa

► see Ojibwa.

Chisinau



Population
(2006 estimate)
593,800

Chisinau is the capital of Moldova, a country in eastern Europe. It is Moldova's largest city and cultural center. The city lies on the Bâc River.

The industries in Chisinau are very important to Moldova's economy. Factories in the city make machinery, electrical appliances, processed foods, and clothing. Chisinau is also the country's center of trade, banking, and communications.

Several different powers have controlled Chisinau during its history. In the 1400s it was part of a region that is now mostly



A park in Chisinau, Moldova, was built to honor Moldovan soldiers who fought in World War I.

in Romania. Troops of the Turkish Ottoman Empire captured the city in the 1500s.

Russia took over the Moldova region in 1812. After that Chisinau was known by its Russian name, Kishinyov. Romania ruled the city in the early 1900s. The Soviet Union took control of Kishinyov in the 1940s.

During World War II (1939–45) many Jews in Kishinyov were killed. German forces also badly damaged the city. The city was rebuilt after the war.

Moldova became an independent country in 1991. The city's name was changed back to Chisinau. It was made the new country's capital.

► More to explore

Moldova

Chocolate

Chocolate is a food and a flavoring that is popular throughout the world. Many candies, baked goods, and drinks contain chocolate.

How Chocolate Is Made

Chocolate begins with the seeds of the cacao tree. The cacao tree grows in warm areas of North and South America, Africa, and Asia. The seeds form in long, cucumber-shaped fruits called pods. When the pods are ripe, workers cut them from the tree and remove the seeds. The seeds sit for several days before being dried, either by the sun or in an oven. The dry seeds, called cocoa beans, are then shipped to processing plants or chocolate factories.

At the plant or factory, workers roast the beans in giant ovens to bring out their flavor. Machines then remove the hard skin surrounding the beans. Next, machines grind the beans into a paste,



Chocolate bars contain cocoa butter and cocoa liquor made from the seeds of the cacao tree.



The seeds from cacao trees are dried to make cocoa beans (left). Cocoa powder is made from crushed cocoa beans.

called chocolate liquor. Chocolate liquor is made up of chocolate solids and a kind of fat called cocoa butter.

A dry powder called cocoa can be made by pressing some of the cocoa butter out of the chocolate liquor. Cocoa powder is sold unsweetened for use in baking and as a flavoring ingredient. It may also be mixed with sugar and milk to make hot chocolate drinks.

Chocolate for eating is made by adding extra cocoa butter to chocolate liquor. To make dark chocolate, workers add sugar to this mixture. Adding both sugar and milk makes milk chocolate. Mixing cocoa butter, sugar, and milk makes white chocolate. These mixtures may be poured into molds to make different shapes of candy.

History

Chocolate's popularity began in ancient Mexico and Central America, where the cacao tree grew wild. The Maya and Aztec peoples prepared a hot, bitter drink with cocoa beans. In 1519 the Aztec emperor Montezuma II served the Spanish explorer Hernán Cortés a chocolate drink called *xocoatl*.

Cortés brought this beverage back to Spain. With sugar, vanilla, and cinnamon added, it became a favorite with the Spanish kings and queens. In the 1600s the drink became popular among rich people in France and England.

In the 1800s people discovered how to make smooth, tasty chocolate for eating. Today the top chocolate-producing countries include the United States, the

United Kingdom, Switzerland, Germany, The Netherlands, and France.

► More to explore

Aztec • Food and Nutrition

Choctaw

The Choctaw are a large Native American tribe that once lived in what is now southern Mississippi. They were probably descended from earlier peoples known as mound builders.

Choctaw villages were clusters of houses made from wood frames covered with mud. The roofs were made from grass or cane reeds. Choctaw women tended fields of corn, beans, and pumpkins. They also gathered wild fruits and nuts. Men fished and hunted for deer and bear.



A painting from the 1800s shows Choctaw men playing a traditional ball game on a large field with tall goalposts.

In the 1540s the Choctaw drove Spanish explorers out of their territory. The tribe was friendlier to the French, who became valued trading partners. In the American Revolution (1775–83) the Choctaw sided with the Americans against the British. They adopted enough American customs to be regarded as one of the Five Civilized Tribes (along with the Chickasaw, the Seminole, the Cherokee, and the Creek).

In 1830 a small group of Choctaw agreed to give the United States their territory in the Southeast in exchange for land in Indian Territory (later Oklahoma). Most Choctaw did not want to leave, but U.S. troops forced them to make the trip. Thousands died on the march. By the late 1800s settlers had taken over much of the new Choctaw territory. In 1907 the land became part of Oklahoma. At the end of the 20th century there were about 87,000 Choctaw, mostly in Oklahoma and Mississippi.

Did You Know?

Since 1817 cholera has swept from country to country seven times, killing millions of people.

► More to explore

Cherokee • Chickasaw • Creek • Mound Builder • Native Americans • Seminole

Cholera

The disease called cholera is an infection of the small intestine. It causes the body to lose important fluids and minerals. Outbreaks of cholera have quickly killed many thousands of people.

Cholera is caused by a certain kind of bacteria. A person gets the disease by



A health worker shows a family in Afghanistan how to use tablets to make water safe to drink. Cholera can spread through contaminated water.

eating food or drinking water that has been contaminated, or infected, with the bacteria.

Diarrhea is usually the first symptom, or sign, of cholera. Vomiting follows the diarrhea. The body rapidly loses large amounts of water and other fluids. The result is a condition called dehydration. The person has a strong thirst and painful muscle cramps. If the dehydration is not treated, the patient may die within a few hours.

Doctors treat cholera mainly by replacing the body's lost fluids. The person may be given fluids to drink. The fluids contain both water and minerals. The doctor also may give the person fluids through a tube that is inserted into a blood vessel. Sometimes the person is given a medicine called an antibiotic.

Cholera often occurs in countries that do not have good sanitation equipment.

The best prevention for cholera is making sure that the water supply is clean. Sometimes people are given a vaccine to protect them from the disease.

► More to explore

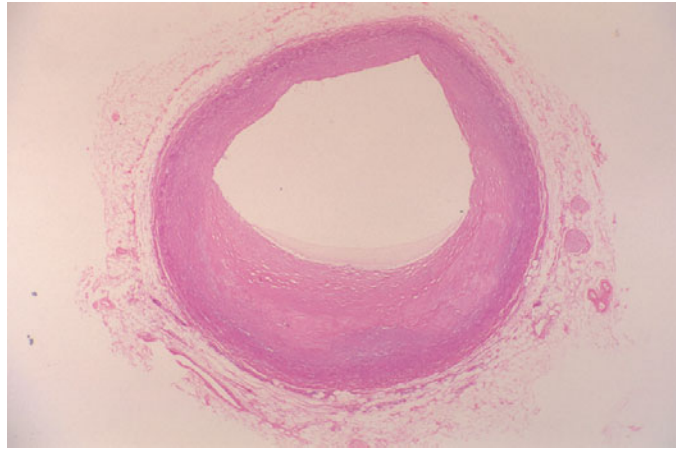
Antibiotic • Bacteria • Intestines
• Vaccine

Cholesterol

Cholesterol is a waxy material that forms in the human body. The body needs cholesterol in order to work. It helps form vitamin D and other products. But too much cholesterol can hurt the body.

Most cholesterol is made in the liver. Certain chemicals called proteins carry it through the bloodstream. Two such proteins are called low-density lipoproteins (LDLs) and high-density lipoproteins (HDLs).

LDLs bring cholesterol from the liver to other cells. After arriving where it is needed, the cholesterol leaves the LDL. The role of HDLs is not as clear. HDLs



When cholesterol builds up in blood vessels, it is difficult for blood to flow through the narrow openings in the vessels.

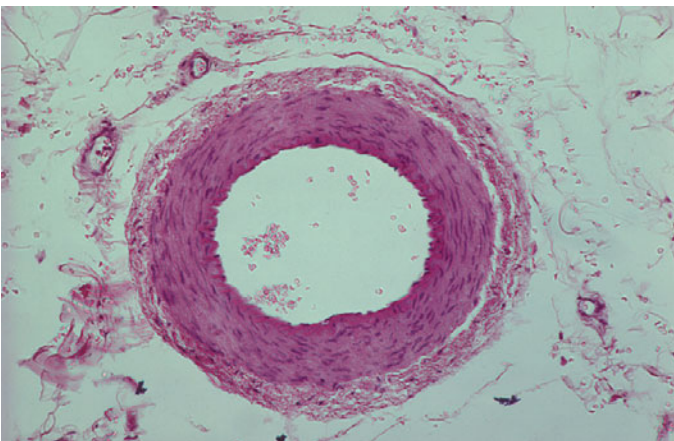
may bring unused cholesterol back to the liver to be broken down before it is removed from the body.

The liver makes most of the cholesterol the body needs. However, because cholesterol is in animal cells, when people eat animal products they are getting extra cholesterol. When extra cholesterol hardens, blood vessels become narrower. It then becomes harder for the heart to pump blood through the vessels. This can cause such problems as heart attacks or strokes.

People can lower their cholesterol levels by exercising, maintaining a healthy weight, and eating healthy foods. Doctors may recommend that people with high cholesterol eat less red meat, egg yolks, cheese, butter, and liver. These are major sources of cholesterol. Because fruits and vegetables do not contain any cholesterol, doctors often advise people to eat more of these types of foods.

Did You Know?

Plants, and foods that come from plants, such as olive oil, canola oil, or corn oil, do not contain cholesterol.



When there is no cholesterol built up in blood vessels, blood can easily flow through the vessels' openings.

Christianity



Worshippers in a Roman Catholic church face the altar, which is heavily decorated. Roman Catholic churches often have more statues and other decorations than Protestant churches.

With some 2 billion followers, Christianity is the world’s most widespread religion. Christianity is based on the life, death, and teachings of Jesus of Nazareth. The religion has three main branches—Roman Catholicism, Eastern Orthodoxy, and Protestantism.

Beliefs

Central to Christianity is the belief that Jesus is the Christ, or chosen one, whom God sent to the world to save humans. Christians maintain that Jesus had to suffer, die, and be resurrected (raised from the dead) to make up for people’s sins. Christians view Jesus’ new life after death as hope that they too may be granted everlasting life.

Christians also believe in the Trinity. The Trinity (meaning the three) is the idea that three figures are united in one God: God the Father, God the Son (Jesus), and God the Holy Spirit. The Holy Spirit is thought of as a helper sent to guide and teach humans.

The sacred scripture of Christianity is the Bible. It has two books—the Old Testament (or Hebrew Bible) and the New Testament, which tells the story of Jesus.

Practices

At the core of Christian living is love for God above all things. Christianity also tells people to love one another and to be forgiving, humble, and kind.

Some Important Christian Holidays		
Holiday	Meaning	Date
Advent	period of preparation for Christmas	begins on the Sunday nearest to November 30
Christmas	celebration of Jesus’ birth	December 25
Epiphany	celebration of the visit by the Magi, or Wise Men, to the infant Jesus	January 6
Lent	period of preparation for Easter	begins 40 days, not including Sundays, before Easter
Easter	celebration of Jesus’ rise from the dead	first Sunday after the first full moon after the spring equinox (March 21)



Some Protestant Christian churches attract large numbers of people.

Many Christians regularly attend church services, with Sunday being the most common day of worship. Services usually involve singing, Bible readings, and a sermon, or a talk by a priest or minister. In many churches, services include a ceremony called Communion. In this ceremony, members eat bread and drink wine in memory of the final meal Jesus had with his followers.

History

Jesus and Followers

Christianity grew out of Judaism in the Middle East. In about AD 29 a Jew named Jesus began to preach in Galilee. He attracted many followers because of his healing powers and his religious teachings. But people in power feared that he might lead an uprising, and they put him to death. The Bible holds that Jesus rose from the dead three days after being put to death, spent 40 days on Earth, and then was taken up to heaven.

For many years, Jesus' followers continued to practice religion in the same way

as Jews, except they believed that Jesus was a savior sent from God. In the 1st century AD a missionary named Paul helped separate Christianity and Judaism into two distinct religions.

Spread of Christianity

To help spread Jesus' teachings, some early Christians wrote about him. Writings by four men—Matthew, Mark, Luke, and John—were chosen as the standard account of Jesus' life and teaching. These four narratives now form part of the New Testament.

In the early days of the church, the Roman Empire controlled most of the Mediterranean region. Life was difficult and dangerous for Christians living within the empire. They were treated harshly for their beliefs. In AD 312, however, the Roman emperor converted to Christianity. By the end of the 300s, Christianity was the empire's official religion. This power helped secure Christianity's place in the world.



Greek Orthodox Christian priests and worshippers gather for a service in Bethlehem. Bethlehem is the Middle Eastern city where Jesus was born.

Christianity in the Middle Ages

Christianity continued to gain strength during the Middle Ages, a period from about 500 to 1500. Its leaders became powerful and wealthy, and the church was the chief cultural institution in Europe.

But as Christianity expanded, it did not remain unified. In 1054 the Eastern church at Constantinople separated from the Western church in Rome because of differences in beliefs and practices. This split created the Eastern Orthodox churches and the Roman Catholic church.

Another major development was the Crusades. In the 11th century a Muslim Turkish empire conquered southwestern Asia, including many places associated with Jesus. Over the next two centuries, armies of European Christians fought Muslim forces in the Middle East, partly in an attempt to recapture the Holy Land.

Modern Period

In the 1500s a German priest named Martin Luther began to question certain practices and teachings of the Roman Catholic church. Luther's criticism helped bring about the religious revolution known as the Reformation. As a result, various reformers eventually founded the first Protestant churches.

As Christianity flourished in Europe, Christians came to believe that their religion should be taught to people in other lands. Beginning in the 1500s and

continuing into the 21st century, Christian missionaries brought their faith to parts of Africa, Asia, and North and South America. These efforts helped make Christianity the most widespread religion in the world.

► More to explore

Bible • Church • Crusades • Eastern Orthodox Churches • Jesus Christ • Judaism • Protestantism • Reformation • Roman Catholicism

Christmas



Girls carry candles and sing in front of a festive Christmas tree in Seoul, South Korea.

Marking the birth of Jesus, Christmas is a major religious holiday for Christians. For many people it is no longer only a religious festival. It has become a season of gift giving and celebration. The date of Christmas is December 25. But Christmas celebrations often take place over several days or weeks.

Did You Know?

In addition to teaching about their religion, missionaries often set up schools and medical clinics.

Several traditional customs are part of the Christmas holiday in the United States. Decorating a Christmas tree with strings of lights and ornaments is one beloved custom. Another common custom is gift giving. This is frequently associated with a figure named Santa Claus.

In many European countries families exchange gifts on Christmas Eve, December 24. Like Santa Claus, Father Christmas and Père Noël are said to deliver presents to children in the United Kingdom and France, respectively. In Spain and Italy children receive presents on the night of January 5.

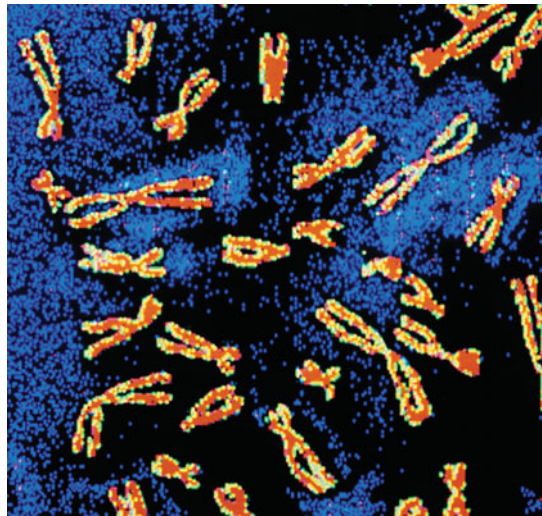
As part of the religious holiday, many Christians attend church services on Christmas Eve or Christmas Day. The word Christmas comes from the Old English term *Cristes mæsse*, meaning “Christ’s mass.” That was the name of the Christian worship service held on December 25 to honor the birth of Jesus. Christians believe that Jesus was born in Bethlehem. The actual day and year of his birth are not certain.

► More to explore

Bethlehem • Christianity • Jesus Christ

Chromosome

Chromosomes are tiny, threadlike structures inside every cell of every organism, or living thing. Chromosomes carry information about the organism in units called genes. When living things reproduce, they pass their genes along to their offspring.



Chromosomes are inside the cells of every living thing. They are so small that they can only be seen through a powerful microscope.

General Features

In animals and plants, chromosomes are located inside the nucleus, or central structure, of each cell. A material called deoxyribonucleic acid (DNA) makes up most of each chromosome. Plant and animal chromosomes also contain a material called ribonucleic acid (RNA) and some proteins.

Some organisms, including bacteria, do not have a nucleus. Their chromosomes float freely within the cell. In these organisms, chromosomes are made up of only DNA.

Chromosome Numbers

Every living thing has a specific number of chromosomes in most of its cells. In most plants and animals, chromosomes come in pairs. Potato cells have 24 pairs, for a total of 48 chromosomes. Mosquito cells have three pairs, for a total of six chromosomes. Human cells have 23 pairs, for a total of 46 chromosomes.

Did You Know?

Damage to chromosomes can cause birth defects and such diseases as cancer.

Humans and most other animals have the same number of chromosomes in every type of cell except one—the sex cells. These are the egg cells produced by females and the sperm cells produced by males. The sex cells have only one half of each pair of chromosomes.

During reproduction, the father's sperm cell and the mother's egg cell combine to form a new cell. This cell is the beginning of an embryo, or developing baby. Each sex cell brings its half set of chromosomes to the embryo. In this way, the embryo gets a full set of chromosomes.

► More to explore

Cell • DNA • Genetics

Chumash

The Chumash are Native Americans who originally lived along the coast of southern California. They were known for the high quality of their crafts.



Long ago, Chumash people painted pictures on cave walls.

Most Chumash lived in villages made up of dome-shaped homes big enough to house several families. Chumash who lived on the coast or on nearby islands fished in the Pacific Ocean. They also hunted seals and sea otters. Farther inland, the Chumash hunted large game animals. Both groups relied on acorns as a source of food. They ground up the acorns to make flour.

Chumash women made baskets that were woven so tightly they held water. Chumash men made objects of stone and whalebone. They also crafted canoes from wooden planks.

The Chumash first met European explorers in 1542. Their first lasting contact with outsiders came in the early 1770s, when Catholic priests began establishing missions in the area. Soon most of the Chumash lived and worked in the missions, sometimes against their will.

The Chumash were freed from the missions in 1834. By that time many had died from diseases caught from the Europeans. After 1849 the survivors struggled as American settlers and gold seekers invaded their lands. By the end of the 1800s only a few Chumash were left. The Santa Ynez Reservation was set aside for them in 1901. At the end of the 20th century there were about 3,000 Chumash. Most lived on the reservation or in nearby towns and cities.

► More to explore

Missions, Spanish • Native Americans

Church

A church is a public place of worship, usually for people of the Christian religion. Some Christian denominations, or groups, also have buildings called cathedrals. A cathedral serves as the central, or main, church for a geographical area.

The layout and design of churches can vary greatly. Still, many churches share some common features.

Most churches include an altar, or a raised platform. The people who perform the religious services are called the clergy. They stand at the altar during the services.

All churches have a seating area for the congregation, or people attending services in the church. Usually people sit in long wooden benches called pews. Some churches have separate seating areas for the choir, or people who sing at church.



Many churches have a tall bell tower.

Many churches have a bell tower containing one or more bells. The bells ring before and after services, to celebrate religious holidays, and sometimes to mark the time of day. Many churches also have stained glass windows. These colorful windows often show stories from the Bible.

Protestant churches tend to be more simple in their design than Roman Catholic churches and cathedrals. Protestant churches usually have fewer religious statues and other decorations as well.

► **More to explore**
Cathedral • Christianity

Did You Know?

Many Christian churches have been built in the shape of a cross.

Churchill, Winston

Winston Churchill was the government leader who led the United Kingdom (Great Britain) to victory during World War II. He was one of the greatest public speakers of his time. He was also a bold soldier and a gifted writer.

Early Life

Winston Leonard Spencer Churchill was born on November 30, 1874, in Oxfordshire, England. His father was a wealthy politician. His mother was from the United States. Winston went to private schools and then to Sandhurst, the British military academy.

In 1895 Churchill entered the British Army. In 1899 he joined the Conservatives, a British political party. He was



Winston Churchill

elected to Parliament (the British legislature) in 1900.

Cabinet Member

In 1908 Churchill joined the top rank of government leaders, called the Cabinet. In 1911 he took control of the British Navy. He made sure that the navy was ready for war. During World War I (1914–18), however, he planned some attacks that failed. For a time he went back into the army. After the war Churchill held several important government jobs.

Wartime Leader

In 1939 World War II began. The British knew that they needed a strong leader. Churchill became prime minister (head of government) in May 1940.

Soon after Churchill took office, the Germans bombed Britain. Churchill stayed strong through the attacks. He

made speeches that gave hope to the British people. In 1945 Britain and its allies—the United States, France, and the Soviet Union—won the war.

Later Life

Churchill lost his position as prime minister after the war. In 1951 he became prime minister again. In 1953 he received the Nobel prize for literature. The prize honored his speech making as well as his writing.

Churchill retired as prime minister in 1955. But he stayed in Parliament and continued to write. In 1963 the United States made him its first honorary citizen. Churchill died in London, Britain's capital, on January 24, 1965.

► More to explore

Parliament • United Kingdom • World War II

Cinco de Mayo

Cinco de Mayo (5th of May) is a national holiday in Mexico. On that date in 1862 Mexican troops defeated



Many Cinco de Mayo celebrations include traditional Mexican dancing.

Did You Know?

When Churchill became prime minister, he said, "I have nothing to offer but blood, toil, tears, and sweat."

invading French forces in a battle at Puebla, Mexico.

The Mexican people remember the event by listening to political speeches and watching parades. Reenactments of the battle are often part of the celebration as well. In the United States, Cinco de Mayo is observed by people of Mexican descent. The holiday is a festive celebration of the heritage of Mexican Americans. In many cities there are parades and events featuring Mexican culture and music, dancing, and food.

In the mid-1800s the French leader Emperor Napoleon III tried to take control of Mexico. The victorious battle celebrated on Cinco de Mayo was an important blow against the French. During the battle of Puebla a small army of Mexican soldiers defeated a much stronger French army.

Circulatory System

All animals need to move important fluids through their body. The fluids move through what is called a circulatory system. The fluids carry nutrients and gases, like oxygen, that keep the animals alive. The fluids also remove wastes from the body. In humans and some other animals they also carry substances that help the body fight infection.

The circulatory system of humans consists of two parts: the cardiovascular

system and the lymphatic system. The main fluid in humans and most other animals is blood. It is transported through the cardiovascular system. This system consists of the heart and a network of blood vessels. The fluid that helps fight infections is called lymph. It is carried in the lymphatic system.

► More to explore

Cardiovascular System • Lymphatic System

Circus



Circus clowns need to have many kinds of performing skills.

A circus is a form of entertainment that features many different spectacular acts. These acts usually include skilled and daring performers, highly trained animals, and funny clowns.

Circus acts often perform in a circle, or ring, with the audience on all sides. Big

circuses may have three rings with different acts inside each one. At one time, circuses put up a tent, known as the big top, to enclose the rings. Many circuses now use indoor arenas.

Circus Acts

Most circuses have many animal acts. Trick riders perform acrobatics on horseback or ride two horses at once. Elephants rise up on their hind legs or stand on their head. Other wild animal acts include dancing bears and tigers that jump through fiery hoops.

Human performers also amaze the audience. Some people walk a tightrope, swing from a hanging bar called a trapeze, or get shot out of a cannon. Clowns make the audience laugh with dancing, juggling, and comedy. They paint their faces white and wear goofy costumes.

The ringmaster—a dashing figure in high boots and a top hat—announces acts and sets the pace. A brass band adds to the excitement.

Circus History

In ancient Rome the circus was an arena for races and fights. A performer named Philip Astley created the modern circus in England in 1768. He built a performance ring where he did tricks on horseback for paying customers. He soon added clowns, acrobats, and other acts. As he toured, he spread the circus idea throughout Europe.

Circuses also spread to the United States. Circus performers and animals



Trapeze artists were popular circus performers during the 1800s.

often traveled from town to town in wagons or trains. They paraded through a town's streets before the first show there. In the 1880s two U.S. circus owners, P.T. Barnum and James A. Bailey, combined their shows to create a huge circus. They called it "The Greatest Show on Earth." The Ringling brothers bought that circus in the early 1900s. They joined it with their own circus to form the Ringling Bros. and Barnum & Bailey Circus. The main tent could seat 10,000 people.

Many circuses closed in the mid-1900s. After 1956, the Ringling Bros. and Barnum & Bailey Circus stopped using tents and moved indoors. Nevertheless, families today can still enjoy that circus and others. One of the biggest modern circus events is the circus festival of Monte-Carlo, in Monaco. Another

Did You Know?

Circus parades, featuring brightly painted and decorated wagons, once marched through towns to show off the animals and performers.

popular modern circus is the Cirque du Soleil of Montreal, Canada, which uses no animal acts.

► More to explore

Theater

Citizenship

Citizenship is everything that has to do with being a citizen, or full member, of a country. Citizens have rights that are given by the country's government. For example, citizens have the right to be protected by a country's laws. In return, citizens have duties that they owe to the country. One of the most important duties is being loyal to the country.

Citizenship is different than nationality. A person's nationality tells which country that person (called a national) is from. But nationals from a certain country are not always citizens of that country. They may have gained citizenship in another country. Or they may have lost their citizenship. People who live in a country but are not citizens or nationals of that country are called aliens.

Becoming a Citizen

Every country has its own rules about who is a citizen and how to become one. Many countries have set up four basic ways to become a citizen. First, anyone who is born in the country is a citizen of that country. Second, anyone whose mother or father is a citizen of the country is also a citizen. Third, anyone who is married to a citizen becomes a citizen. Fourth, a person who goes through a process called naturalization becomes a citizen.

Naturalization is a way for people who are born in one country to become citizens of another country. Laws on naturalization are different from country to country. Usually, aliens who want to be naturalized must have lived in the new country for several years. They usually must speak the country's language. They may have to pass a test about the laws and history of the country. They often must take an oath, or swear to be loyal to the country. However, not every country allows aliens to become naturalized citizens.

Rights and Responsibilities

Citizens have certain rights. Some countries give their citizens more or different rights than other countries. Citizens usually have the right to vote. They usually have the right to be elected to government jobs as well. Other rights of citizens may include the right to follow any religion and the right to speak freely.

Citizens also have duties, or responsibilities. Voting is a responsibility as well as a right. Citizens must vote to make sure

Did You Know?

The idea of citizenship first arose in ancient Greece. A citizen in a Greek city-state was able to vote. He also had to pay taxes and serve in the military.



People from more than 40 countries are made U.S. citizens during a ceremony on Ellis Island, near New York City.

that their government works for the good of its citizens. Citizens also may have the duty to serve on a jury during a trial in court. Some countries make serving in the military a duty of all citizens.

Aliens may have some of the same rights as citizens. But they usually cannot vote or serve in the government. Aliens also have some of the same responsibilities as citizens. They must obey the country's laws. They often must pay taxes as well.

Losing Citizenship

People cannot lose their citizenship except in very special cases. A government may take away the citizenship of someone who becomes a naturalized citizen of another country. A government also may take away the citizenship of people who show allegiance, or loyalty, to another country. Examples of this include voting in a foreign election and serving in a foreign military. Trying to overthrow the government by force is a serious crime that can result in loss of citizenship. Naturalized citizens who commit serious crimes may lose their citizenship as well.

People who have lost their citizenship can end up as citizens of no country. These people are called stateless persons.

► More to explore

Civil Rights • Country • Government
• Voting

Citrus Fruit

Oranges, grapefruit, lemons, limes, shaddocks, and citrons are all types of



Citrus fruits include oranges, grapefruit, lemons, and limes. They are healthy because they contain a lot of vitamin C.

citrus fruit. Citrus fruits have a juicy pulp inside a leathery skin. They grow on trees, bushes, or shrubs. Citrus plants belong to the rue family of flowering plants. This family also includes the tiny orange fruits called kumquats.

Where Citrus Fruits Grow

Citrus fruits grow in warm regions in many parts of the world. They grew first in southern China and other parts of Asia. Arab traders brought citrus fruits to the Middle East, Africa, and Europe. European explorers brought citrus fruits to the Americas by the 1500s.

Farmers often grow citrus trees in areas called groves. Citrus plants may also grow in the wild or in people's gardens.

Physical Features

Citrus fruits have leathery peels, or rinds. Inside the rind, the flesh, or pulp, is divided into eight or more sections. Each section contains many tiny, juicy

pouches and seeds. However, farmers have learned how to grow seedless varieties of many types of citrus fruit.

Oranges and grapefruit are round. Oranges are usually orange in color. Grapefruit are yellow and often larger than oranges. Orange trees and grapefruit trees often reach 20 feet (6 meters) in height. Both types of tree have white flowers and shiny, green leaves.

Lemons and limes are more oval in shape. They often have a bump on one end. Lemons are yellow and larger than limes, which are green. Lemon trees and lime trees are generally smaller than orange or grapefruit trees. Lemon trees have purple and white flowers and reddish or green leaves. Lime trees have white flowers and pale green leaves.

Shaddocks are also called pummelos. They are big, yellow fruits with a round or pearlike shape. Their pulp is pale or red. Shaddock trees grow to a height of 20 to 43 feet (6 to 13 meters). They have shiny, green leaves and large, white flowers.

Citrons look like large lemons. They have whitish pulp. The rind has a thin outside layer and a thick inside layer. Citron trees grow to about 11.5 feet (3.5 meters) tall. They have pale green leaves and purple or white flowers.

Uses

Citrus fruits are a healthy food because they are rich in vitamin C. Many people eat citrus fruits raw or squeeze them to make juice. People also use citrus fruits

to flavor drinks and cooked dishes. In addition, citrus fruits may be canned or made into jam.

Citrus rinds provide oil that may be used as a flavoring or in making perfume and medicines. Rinds may also be cooked with sugar to make candy.

► More to explore

Fruit • Grapefruit • Lemon • Lime
• Orange

City

A city is a place where many people live closely together. City life has many benefits. Cities bring together a great variety of people from different backgrounds. They offer more jobs, more schools, and more kinds of activities than smaller towns and villages. But cities also can be dangerous and polluted.

About half the world's people live in cities. Tokyo, Japan, has more people than any other metropolitan area. (A city's metropolitan area includes the city itself and other places close by.) New York City is the largest city in the United States.

City Features

A city's central business district, or downtown, usually has its tallest office buildings and biggest stores. The downtown area is often the oldest part of the city. A city usually has one or more areas of factories and warehouses (storage buildings) outside of downtown. Most of the city's homes lie still farther from downtown.

Did You Know?

More than 100 million tons of citrus fruits are produced every year. Oranges make up more than half of the total.



Tokyo and its surrounding areas have more people than any other city in the world.

Cities usually have a variety of places for entertainment and relaxation. These include museums, concert halls, theaters, parks, and sports arenas.

Cities commonly have a public transportation system to help people get around without cars. Public transportation includes buses, trains, and subways. Subways are trains that run underground.

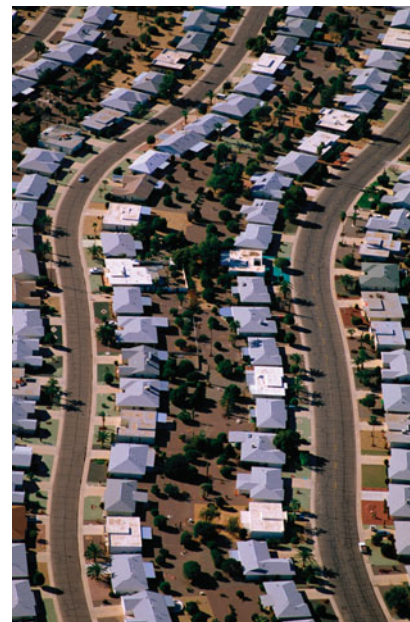
Built-up areas called suburbs lie outside the boundaries of most cities. Suburbs tend to have more houses and apartments than businesses. Many people live in the suburbs and commute, or travel, to their jobs in the city.

City Government

Like countries and states, cities have a government. A city government usually includes a group of elected lawmakers called the city council. Most cities also elect a leader called a mayor. In other

cities the city council names a leader called a city manager.

City governments provide many services. These include police protection, firefighting, hospitals, and schools.



Suburbs usually have more houses than businesses. People who live in the suburbs often work in a nearby city.

Many cities also support museums and libraries.

City Problems

Cities attract people looking for work, education, and other ways to improve their lives. But city life can also be hard. Not everyone shares equally in the benefits of the city. Some people live in run-down, overcrowded housing. Others have no homes at all. They sometimes live on city streets. Crowded living conditions in cities also lead to crime, traffic, and pollution.

History

About 5,500 years ago people in Mesopotamia (now Iraq) started the first cities. Rome (now in Italy) may have been the largest ancient city. Between 250,000 and 1.6 million people lived there.

Some cities in ancient times and in the Middle Ages (AD 500–1500) were independent of any country. They were called city-states. City-states ruled themselves and the surrounding area. Athens and Sparta were major city-states of ancient Greece. From the 1000s to the 1400s Florence, Venice, and other city-states were important in what is now Italy. After the Middle Ages these cities lost their independence. Today almost all cities belong to a particular country.

The Industrial Revolution, which started in the late 1700s, contributed to the growth of cities. New machines invented during this period made manufacturing an important business. Many people from the countryside moved into



Ruins of an ancient city called Harappa stand in present-day Pakistan. Harappa was one city of the Indus Valley civilization, which lasted from about 2500 BC to about 1700 BC.

cities. They looked for work in newly built factories.

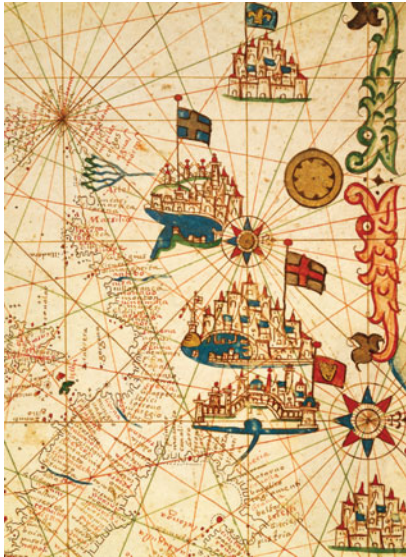
In the late 1800s architects invented new building methods that changed the way cities looked. Tall buildings called skyscrapers appeared in many cities.

During the 1900s cities continued to change. They grew rapidly in population. They also spread outward. Many people moved to the suburbs. Some highly populated areas became known as megalopolises. Megalopolises often include several cities and many suburbs.

► More to explore

Architecture • City-State • Government
• Industrial Revolution • Pollution
• Skyscraper • Transportation

City-State



Venice and Genoa, now both in Italy, were important city-states during the Middle Ages. Sailors used charts called portolans to find these cities and others on the Mediterranean Sea.

Almost every modern city is part of a country. In ancient times and in the Middle Ages, however, there were cities that were independent. They are known as city-states. Each city-state governed only itself and the surrounding countryside.

City-states date back to the earliest years of Western civilization. Between 5000 BC and 2500 BC about a dozen city-states arose in Mesopotamia (modern-day Iraq). After 2300 BC, however, these city-states lost their independence and were forced to become part of the Akkadian Empire.

City-states developed again in ancient Greece, where mountains separated communities from each other. The

Greek city-states tried many kinds of government. Athens is considered to be the birthplace of democracy. Sparta was a military stronghold ruled by kings. Without lasting alliances, however, the Greek city-states were too weak to resist invaders. The Macedonians and later the Romans conquered Greece, and most city-states fell into ruin. Athens survives today as a modern city.

City-states emerged again in Europe during the Middle Ages. Venice, Florence, Genoa, Amalfi, and other city-states dominated the culture of what is now Italy from the 1000s to the 1400s. City-states also developed in what are now northern Germany and Belgium. They prospered from trade until they lost their independence to larger kingdoms.

One modern country that is considered a city-state is Singapore, which broke off from Malaysia in 1965. Its unique geography—a large island containing one major city—allowed it to develop as a self-governing city-state.

► More to explore

City • Greece, Ancient • Mesopotamia
• Singapore

Civilization

A civilization is a large group of people who share certain advanced ways of living and working. Civilizations came about as humans started living in cities. City people developed advanced forms of culture and government. Eventually,



A carving shows Hammurabi (left), a king of Babylon. Babylon was a part of the ancient civilization that developed in Mesopotamia, in what is now Iraq.

this advanced lifestyle spread to people in large regions around cities.

How Civilizations Developed

The first civilizations developed in regions where farmers grew enough food to feed themselves and others. The people who did not farm began to live in larger villages, which grew into cities. These people practiced arts and crafts that they could trade for food. They developed writing systems to keep track of trade. They started transportation networks to carry goods between farm and city. City people also created governments and laws. They developed advanced religious practices as well.

Early Civilizations

The earliest civilizations developed in river valleys because the land there was

good for farming. The world's first civilization formed in Mesopotamia. This land was between the Tigris and Euphrates rivers in what is now Iraq. People first started settling there in about 4500 BC. The world's second civilization developed along the Nile River in about 2925 BC. It is now known as ancient Egypt.

By about 2500 BC another ancient civilization had formed in the valley of the Indus River. This was located around what is now the border between India and Pakistan. Ancient Chinese civilization developed by about the 1700s BC around the Huang He, or Yellow River.

Later Civilizations

Since these beginnings many great civilizations have risen and fallen. The ancient Greeks and Romans built civilizations in Europe. The Maya, Aztec, and Inca formed civilizations in the Americas. African peoples developed civilizations centered around such cities as Aksum and Great Zimbabwe. Arabs created an Islamic civilization in the Middle East and North Africa.

Today most people in the world belong to a civilization. European and American civilization is often called Western civilization. African, Asian (or Eastern), and other civilizations are sometimes known as non-Western civilizations.

► More to explore

City • Culture • Egypt, Ancient
• Government • Indus Valley
Civilization • Mesopotamia

Did You Know?

The word civilization comes from the Latin word *civis*, which means "city dweller." Latin was the language of ancient Rome.

Civil Rights

All people have certain rights. These are often divided into human rights and civil rights. Human rights include the right to live as a free person, the right to have shelter and food, and the right not to be mistreated. These rights belong to all humans just because they are human. Civil rights are rights that are granted to citizens by a government. For example, governments may decide who can vote, who can buy property, or who can be educated.

The Development of Civil Rights

The idea that governments should give people certain rights is a modern one. Before the 1700s groups of people sometimes fought for better treatment from a king or a ruler. In these cases, however, they wanted rights only for their own group. For instance, the Magna Carta was a document that granted rights to noblemen in England. The king signed it in 1215. But most people still had no way to complain if the king mistreated them.

In the 1700s some people began to talk about the idea that all people had certain rights. They thought that it was wrong for kings to ignore these rights. This idea led some people to fight two major revolutions against their kings—the American Revolution and the French Revolution. Afterward, the Americans and the French set up new forms of government run by the people. These governments granted certain civil rights to the people. In the United



A man votes in South Africa. Voting became a civil right for both black and white South Africans in the 1990s.

States, the Bill of Rights of the U.S. Constitution listed many of these rights. France used a similar list, the Declaration of the Rights of Man and of the Citizen, as a part of its first constitution.

The Fight for Equal Rights

However, even these new governments did not give equal rights to all citizens. Women did not have the right to vote in the United States until the 1920s. French women could not vote until 1945. African Americans were enslaved in parts of the United States until the mid-1860s. Even after they gained freedom, the government did not always protect their rights. They fought to gain the same civil rights as whites for many years. The civil rights movement that began in the 1950s was a part of this struggle. Today people in some countries are still fighting to gain the same civil rights that other citizens have.

► More to explore

Bill of Rights • Civil Rights Movement
• Human Rights • Magna Carta

Civil Rights Movement

The rights of a country's citizens are called civil rights. Many African Americans were denied full civil rights for about 100 years after the end of slavery. The struggle for those rights, especially in the 1950s and 1960s, is known as the civil rights movement.

Before the Civil War most blacks in the United States were slaves, who had no civil rights. After the war ended in 1865, blacks made some progress. Between 1865 and 1870 the 13th, 14th, and 15th amendments to the U.S. Constitution ended slavery and gave citizenship and voting rights to former slaves.

These rights were often ignored, however, especially in the South. To keep

poor African Americans from voting, some states made people pay a tax or pass a difficult test before they could vote. Violent groups such as the Ku Klux Klan tried to scare blacks away from the polls. Southern governments passed laws to keep African Americans separate, or segregated, from whites. In many places, for example, black children were not allowed to attend the same schools as white children.

Some African Americans resisted this unfair treatment all along. But not until the 20th century did blacks organize themselves into a movement. The most important leader in the early years of the civil rights movement was W.E.B. Du Bois. In 1909 he and others formed the National Association for the Advancement of Colored People (NAACP). The NAACP used the courts to fight for civil rights for blacks.

Events of the 1950s

The civil rights movement won its first major victory in 1954, in the court case of *Brown vs. Board of Education of Topeka, Kansas*. NAACP lawyers led by Thurgood Marshall argued the case before the U.S. Supreme Court. The Court ruled that separate schools for whites and blacks were unequal and therefore violated the Constitution.

On December 1, 1955, in Montgomery, Alabama, a black woman named Rosa Parks was arrested for refusing to give up her seat on a bus to a white person. Blacks protested her arrest by boycotting (refusing to use) the bus system. Late in 1956 the Supreme Court ruled that seg-



W.E.B. Du Bois (center row, second from right) and other early leaders of the civil rights movement are pictured in 1905.

Did You Know?

The U.S. Supreme Court ruled that racial segregation was legal in 1896. The Court reversed this decision in 1954.



In 1958 a group of African American children take part in a protest against a restaurant in Oklahoma. The restaurant had refused to serve African Americans.

regation on public transportation was unconstitutional. One of the leaders of the boycott was a young minister named Martin Luther King, Jr. In the late 1950s King organized the Southern Christian Leadership Conference, a group dedicated to peaceful civil rights activities.

Many white people resisted change, especially in the South. In 1957 whites rioted at a high school in Little Rock, Arkansas, when the first black students enrolled there. U.S. President Dwight D. Eisenhower sent soldiers to restore order.

In 1960 the civil rights movement began using a form of protest called the sit-in. Protesters sat down in a place where they knew they would not be served, such as a segregated lunch counter, and refused to leave. Though the protesters were

often harassed or arrested, they remained peaceful, which created sympathy for their cause. A group called the Student Nonviolent Coordinating Committee organized many sit-ins.

In 1961 a group called the Congress of Racial Equality began sponsoring Freedom Rides through the South. African Americans and whites traveled together to make sure buses and stations were integrated. Some Freedom Riders were beaten or arrested. In Alabama a bus was bombed.

In August 1963 about 250,000 people gathered in Washington, D.C., to urge Congress to pass a civil rights law. The people sang “We Shall Overcome,” and King delivered a powerful speech known for the phrase “I Have a Dream.” The event was called the March on Washington.

The civil rights movement won major victories with the passage of new laws in 1964 and 1965. The Civil Rights Act of 1964 was the most extensive civil rights law in U.S. history. It outlawed discrimi-



Crowds of people protested for civil rights at the March on Washington in 1963.

nation in public places, in hiring, and in government programs. It also ended registration requirements and other obstacles to voting. The Voting Rights Act of 1965 ended other voting restrictions and led to a great increase in the number of black voters.

Beyond the Civil Rights Movement

Some African Americans were not satisfied with the progress made by the civil rights movement. Frustration led to rioting in several cities between 1965 and 1967. Some blacks formed groups that were willing to use violence to win racial justice. Malcolm X was an early leader of this “black power” movement. In 1968 King was assassinated in Memphis, Tennessee. His murder ended the civil rights movement as a unified effort.

In the years that followed, however, many civil rights leaders continued to work for racial equality by running for political office. The number of black public officials grew dramatically. Black leaders sought to help African Americans by supporting affirmative-action programs. These programs tried to make up for past wrongs by assuring economic and educational opportunities for blacks, women, and other groups.

► More to explore

African Americans • Du Bois, W.E.B. • King, Martin Luther, Jr. • Marshall, Thurgood • National Association for the Advancement of Colored People • Slavery

Civil War, American

► see American Civil War.

Civil War, Spanish

► see Spanish Civil War.

Clam

► see Bivalve.

Classical Music

The term classical music has several meanings. Many countries call their own traditional or ancient music classical music. However, in Western parts of the world people use the term classical music to refer to art music.

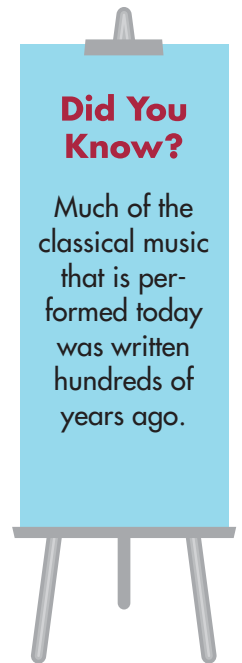
Art music, or classical music, is different from popular and folk music. Classical music is more complex. It is usually written down in a form that classical musicians can read off the page. Classical musicians do not frequently improvise. To improvise means to make up music while playing it.

Instruments and Forms

People called composers write classical music. They write classical music for different types of instruments. The music may require stringed instruments, wind instruments, keyboard instru-

Did You Know?

Much of the classical music that is performed today was written hundreds of years ago.



ments, or percussion instruments, or a combination of any of these.

Composers usually decide how many instruments should play a musical work. A musical work may be written for only one instrument, a few instruments, or a large group of instruments. An orchestra is a large group of instruments.

History

Classical music developed in Europe over hundreds of years. Much of the earliest classical music was used in religious ceremonies. Later, nonreligious music became more popular. Musicians often performed classical music to entertain audiences in royal courts.

Classical musical grew and changed rapidly from the late 1500s to the mid-1700s. The modern orchestra was formed during this time. Also, musicians created new types of classical music, such as opera. One of the greatest composers of this time was Johann Sebastian Bach.

Music experts call the time from about 1750 to 1820 the classical age. In this period, musicians developed a number of musical forms. One of them was the symphony, a long musical composition for an orchestra. Another was the string quartet, a musical composition for two violins, a viola, and a cello. Some important composers from the classical age are Wolfgang Amadeus Mozart and Ludwig van Beethoven.

Beethoven's music influenced many classical composers of the 1800s. Much

classical music during this time was dramatic and emotional. Some of the most famous composers from this period are Peter Tchaikovsky and Johannes Brahms.

The 1900s were a time of great experimentation in classical music. Composers used new forms and even new instruments. For example, electronic instruments opened up new ways of expression for composers and musicians. Claude Debussy, Igor Stravinsky, and John Cage were important composers of the 1900s.

► More to explore

Bach, Johann Sebastian • Beethoven, Ludwig van • Folk Music • Mozart, Wolfgang Amadeus • Music • Opera • Orchestra • Popular Music

Claw

► see Nail and Claw.

Clay

Clay is a natural material made up of tiny particles of rock. When clay is mixed with enough water, it feels like soft, gluey mud. Unlike plain mud, however, clay holds its shape. Clay can be pinched, rolled, cut, or built up in layers to form shapes of all kinds.

Wet clay makes a very useful building material because it hardens as it dries. Clay baked, or fired, in an oven becomes especially hard and may last a very long time. Archaeologists have found pots

Did You Know?

The ancient Greeks selected and arranged the tones, or sounds, on which Western classical music is based.



A worker makes pipes from clay in China.

and bowls made of clay that are thousands of years old.

Like many other minerals, clay is mined, or dug up, from the ground. Before clay can be used, it must be cleaned. Cleaning removes small pieces of rock and other debris, or unneeded materials. Sometimes workers add sand to the clay to make it stronger.

People use different types of clay to make many things, including dishes, flowerpots, tiles, sewer pipes, sinks, toilets, and bricks. Kaolin, or china clay, is the most valuable type of clay. It is important in the manufacture of fine china and porcelain. It is also used to make rubber, paint, and paper. A very fine coating of kaolin gives certain papers a smooth surface. Kaolin is usually white in color. Other types of clay may be tan, brown, red, or gray.

Craftspeople who make things from clay sometimes use a pottery wheel to shape the clay. A pottery wheel is a round, flat surface that rotates, or spins. Clay placed

on a pottery wheel can be shaped into such objects as vases, jars, and pots.

► More to explore

Brick and Tile • Pottery

Cleary, Beverly

Beverly Cleary is a popular author of lively, funny children's books. Her stories are often based on her own adventures as a child in Portland, Oregon.

Early Life

Beverly Bunn was born in McMinnville, Oregon, on April 12, 1916. She moved to Portland with her family when she was 6. Beverly struggled with reading as a child. But with the help of her mother, she learned to read at the age of 8. She developed a great love for reading and often visited the local library.

Career

In 1940 Beverly married Clarence Cleary. She decided to become a full-time author after working as a librarian in the 1940s. Her books are about kids



Beverly Cleary

Did You Know?

Cleary used her own twins as the basis for the characters Mitch and Amy in her books.

and their adventures—subjects that she would have liked to read about as a child.

Cleary published her first book, *Henry Huggins*, in 1950. Since then she has published more than 35 books. Her best-known books include *The Mouse and the Motorcycle* (1965), *Ramona and Her Father* (1977), *Ramona Quimby, Age 8* (1981), *Dear Mr. Henshaw* (1983), *Beezus and Ramona* (1987), and *Muggie Maggie* (1990).

Cleary's books have been published in many different languages. Cleary has won the Newbery Medal three times. The Newbery is a yearly prize awarded to outstanding books for children.

Clemens, Samuel Langhorne

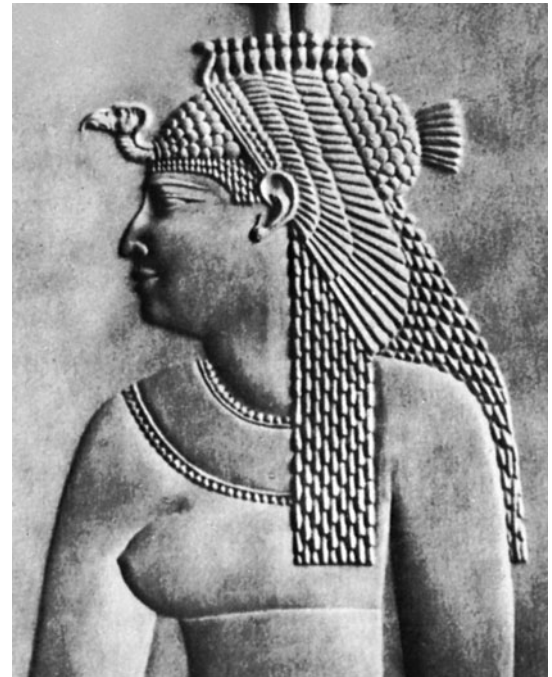
► see Twain, Mark."

Cleopatra

Cleopatra was a queen of ancient Egypt. She wanted to make her country more powerful. To do so, she got the help of two leaders of ancient Rome: Julius Caesar and Mark Antony. However, a third Roman leader, Augustus, defeated her.

Early Years

Cleopatra was born in 69 BC in the city of Alexandria in Egypt. Her family originally came from Macedonia in Europe,



Cleopatra was a queen of ancient Egypt. She remains a symbol of beauty and power today.

but it had ruled Egypt for more than 200 years. Cleopatra and her brother, Ptolemy XIII, became rulers together after their father died in 51 BC. However, her brother had followers who soon drove Cleopatra from power.

Help from Caesar

Cleopatra went for help to Julius Caesar, a powerful Roman ruler who was then in Egypt. In 47 BC Caesar defeated Ptolemy XIII's forces, and Ptolemy died. Cleopatra returned to the throne. Her youngest brother, Ptolemy XIV, became co-ruler.

Cleopatra soon followed Caesar to Rome. She stayed there until he was murdered in 44 BC. Ptolemy XIV died in the same year. Cleopatra probably had him poisoned.

Mark Antony

After Caesar's death, Mark Antony became one of the three leaders of Rome. Cleopatra knew he could help her to gain more power. She charmed Antony, and he fell in love with her. Antony eventually left his wife Octavia to live with Cleopatra. This angered Octavia's brother Octavian, who later became the emperor Augustus. He soon declared war against Antony and Cleopatra.

Augustus defeated Antony and Cleopatra in the battle of Actium in 31 BC. The couple fled to Alexandria. About 10 months later, Augustus captured Alexandria. Antony killed himself. Shortly afterward, in 30 BC, Cleopatra also died. According to legend, she let a poisonous snake bite her. After Cleopatra's death, Egypt became a province of the Roman Empire.

► More to explore

Augustus • Caesar, Julius • Egypt, Ancient

Cleveland, Grover

Elected in 1884 and again in 1892, Grover Cleveland was both the 22nd and the 24th president of the United States. Cleveland was the only president ever to be reelected after a defeat.

Early Life

Stephen Grover Cleveland was born in Caldwell, New Jersey, on March 18, 1837. He was the son of Richard Falley Cleveland, a Presbyterian minister, and Ann Neal. Grover grew up in New Jersey and later in New York State. After his father died in 1853, Cleveland supported his mother and sisters. In Buffalo, New York, Cleveland worked in a law firm. In 1859 he became a lawyer.

Political Career

Cleveland soon joined the Democratic Party. In 1863 he became the assistant district attorney for Erie County, New



TIMELINE

Cleveland is born in Caldwell, New Jersey.

March 18, 1837

Cleveland is elected president.

1884

Cleveland defeats Harrison to win a second term as president.

1892

Cleveland dies in Princeton, New Jersey.

June 24, 1908

Cleveland is elected governor of New York.

Cleveland loses the presidential election to Benjamin Harrison.

Cleveland retires.

1897



Grover Cleveland was the 22nd and 24th president of the United States.

York. From 1870 to 1873 he served as county sheriff. In 1881 he was elected mayor of Buffalo. He became known for attacking dishonesty in city government. A year later Cleveland was elected governor of New York.

In 1884 the Democrats nominated Cleveland for the presidency. With his reputation for honesty, Cleveland contrasted sharply with his Republican opponent, James G. Blaine, who was known for political scandals. Cleveland defeated Blaine in a close election.

First Term

President Cleveland fought corruption and wastefulness. He hired government employees based on their ability, not their political loyalties. He also rejected dishonest claims for pensions made by Civil War veterans. In 1887 he signed

the Interstate Commerce Act, which established an agency to oversee the railroad industry.

In 1886 Cleveland married Frances Folsom, who became a popular first lady. The couple had five children.

Cleveland ran for reelection in 1888. His Republican opponent was Benjamin Harrison. Cleveland received about 100,000 more popular votes than Harrison, but he lost in the electoral college.

Second Term

After practicing law for four years, Cleveland ran for president again in 1892. This time he soundly defeated Harrison.

Cleveland now faced serious economic and labor problems. As the United States sank into an economic depression, banks and businesses failed. Workers angered by wage cuts went on strike, or refused to work. In 1894 a strike in Chicago against the Pullman railroad car company turned violent. Cleveland sent in federal troops to end the strike. That decision lost him the support of many workers.

Cleveland generally stayed out of foreign affairs. He refused to make Hawaii a U.S. territory. He also refused to help a group of Cubans revolting against Spanish rule.

Retirement

In 1896 the Democrats nominated William Jennings Bryan for president instead

of Cleveland. The next year Cleveland retired to Princeton, New Jersey. He worked at Princeton University until he died on June 24, 1908.

► More to explore

Electoral College • Harrison, Benjamin

Cliff Dwellers

► see Anasazi.

Climate

The weather found in a certain place over a long period of time is known as the climate. An area's climate determines what kinds of plants can grow and what kinds of animals can survive there. People use information about climates to decide which crops to plant, to prepare for natural disasters, and even to choose the best season for traveling to vacation spots.

Studying Climates

The study of climates is called climatology. Scientists have many tools to help in this study. They set up weather stations on Earth to measure rainfall, temperature, and wind speed. They send weather balloons with special instruments up into the atmosphere. Weather satellites in space also report information to scientists on the ground.

Factors That Affect Climate

Many factors affect climate. These factors include the sun, oceans, winds, land types, clouds, and human activities.



A weather balloon is released at a weather station at the South Pole.

Sunlight affects climate by hitting Earth unevenly. Places near the equator receive lots of strong sunlight throughout the year. This gives them a hot climate year-round. Places far from the equator get less strong sunlight, and so they are cooler.

Oceans also affect climate. Land near an ocean usually has a milder climate than an inland area. The ocean warms the land in winter and cools it in summer. This happens because water cools and heats more slowly than land.

Winds affect climate by carrying warm or cool air to areas. Winds also bring different amounts of moisture.

The type of land in an area affects the climate, too. For example, mountain ranges can block cold air. Also, places that are at higher elevations are usually cooler than nearby places at lower elevations.

Clouds affect climate by blocking the amount of heat received from the sun

during the day. During the night, clouds keep heat from escaping into space.

Finally, human activities may affect climate. When people burn fuels such as oil and coal to run cars and heat homes, the fuels release certain gases into the air. These gases trap heat on Earth. Some scientists think that Earth is slowly getting warmer and that this may be because of the extra gases in the air. This idea is known as global warming.

Types of Climates

No two places on Earth have exactly the same climate. Nevertheless, many climates are similar to one another. Some of these general types of climates are tropical, subtropical, cyclonic, polar, and highland.

Tropical climates are warm all year and have no winter. They lie near the equator. Some tropical climates have a lot of rain. Others are dry.



A village in northern Tunisia has warm and sunny summers. Many people take vacations in places with pleasant climates.

Subtropical climates are found north and south of the tropical climates. They have a greater range of temperatures than tropical climates. They also may be humid or dry.

Cyclonic climates are found mostly north of the equator. In these climates, cold air from the north mixes with warm tropical air from the south. This mixing often causes rain and snow. Cyclonic climates usually have warmer summers and colder winters.

Polar climates are very cold. Snow and ice often covers the land. Some polar areas always have a layer of frost, called permafrost, below the soil.

Highland climates have a great range of temperature between day and night. They tend to be humid and cooler than the lower lands nearby.

► More to explore

Global Warming • Weather

Clinton, Bill

The 42nd president of the United States, Bill Clinton served two terms, from 1993 to 2001. A popular leader, Clinton oversaw a growing economy. However, he was also the second U.S. president to be impeached, or officially charged with a crime. (The first was Andrew Johnson in 1868.)

Early Life

William Jefferson Blythe III was born on August 19, 1946, in Hope, Arkansas. His father died in an automobile acci-



Bill Clinton was the 42nd president of the United States.

dent before Bill was born. His mother, Virginia Dell Blythe, later married Roger Clinton, and Bill took his stepfather’s name.

Clinton graduated from Georgetown University in Washington, D.C., in 1968. He then attended Oxford University in England. In 1973 he earned a law

degree from Yale University. In 1975 Clinton married Hillary Rodham, a fellow graduate of Yale Law School. They had one daughter.

Political Career

In 1974 Clinton ran for a seat in the U.S. House of Representatives but lost. Two years later he was elected attorney general of Arkansas. In 1978 he became governor. Clinton lost the election of 1980 but won again two years later. Voters reelected him three more times. As governor, Clinton reformed Arkansas’s educational and tax systems.

Presidency

Clinton became the Democratic candidate for president in 1992. He chose Senator Al Gore as his vice presidential running mate. Clinton defeated his Republican opponent, President George Bush. He took office in January 1993.

Clinton’s first term had many successes. He appointed women and minorities to



T I M E L I N E

Clinton is born in Hope, Arkansas.	Clinton is elected governor of Arkansas.	Clinton defeats George Bush to win his first term as president.	Clinton defeats Bob Dole to win a second term.	The U.S. House of Representatives impeaches Clinton.	The U.S. Senate rules that Clinton is not guilty.	Clinton retires as president.
August 19, 1946	1978	1992	1996	1998	1999	2001

important posts. He oversaw a major trade agreement between the United States, Canada, and Mexico. He attended peace talks between Israel and the Palestinians in the Middle East. He also sent U.S. peacekeeping forces to Bosnia and Herzegovina after that country's civil war.

However, Clinton's plan for a health care system failed. He and his wife also became linked to a business scandal known as the Whitewater affair. Nevertheless, Clinton defeated Republican Bob Dole in the 1996 election. Many people were happy with Clinton because the economy was doing very well.

In 1998 the public learned that Clinton had had an improper relationship with a young worker at the White House. The U.S. House of Representatives voted to impeach the president, or charge him with crimes. The House charged the president with lying under oath and trying to stop the investigation of the affair. In 1999 the Senate found Clinton not guilty.

Despite his impeachment, Clinton remained popular. He spent his last year as president working for peace agreements in the Middle East and in Northern Ireland. Clinton's vice president, Gore, lost the 2000 election to the Republican candidate, George W. Bush.

► More to explore

Bush, George • Bush, George W.
• Johnson, Andrew

Clock

A clock is a device used to tell time. Moving hands on the face of a clock point to the current hour, minute, and second. A clock can be big enough to be in a giant tower. A clock can also be small enough to fit on a person's wrist, where it is called a watch. Many clocks are made to be beautiful objects as well as useful devices.

How Clocks Work

There are three main types of clocks: mechanical, electrical, and atomic. All three have the same basic parts. They must have a source of power, a device to keep the parts moving at regular intervals, and a way to display the time.

Mechanical clocks get their power from moving weights or springs. These parts are attached to gears, or toothed wheels. The gears are attached to the hands of the clock. As the gears move they move



The Houses of Parliament (a group of government buildings in London) are famous for their large clock tower. Big Ben is the name of the bell inside the tower.

Did You Know?

Hillary Rodham Clinton was the first wife of a sitting president to be elected to public office.

the hands. Another device attached to the gears keeps them moving at a regular pace. Mechanical clocks must be wound up to work.

Electrical clocks get their power from electricity instead of weights or springs. The electricity can come from a battery or from an electrical socket in a wall. Some electrical clocks have hands, as mechanical clocks do. Others have a digital display, where the hours, minutes, and seconds are shown as numbers. Electrical clocks are the most common type of clock used today.

Atomic clocks measure time using the waves of energy given off by atoms—the tiny bits of matter that make up the universe. Atomic clocks normally have digital displays. Because atomic clocks are the most accurate type of clock, scientists use them in their work.

History

In ancient times people measured time by watching the position of the sun in the sky. As the sun passed over a column or other device it would create a shadow. The length of the shadow would change depending on where the sun was in the sky. The length of a column's shadow therefore showed the basic time of day.

Eventually people wanted to tell time more accurately. The first mechanical clock was invented in the mid-1300s. Clocks powered by coiled springs and swinging weights were introduced in the 1500s. Clocks powered by electricity appeared in the late 1800s and early

1900s. Atomic clocks were developed in the 1950s.

► More to explore

Sundial • Time

Clothing

Many animals have fur, feathers, or other natural coverings to protect them from the weather. Humans have almost no natural protection from the weather. Even so, they live in some of the hottest and coldest places on Earth. People also have modesty, or the desire to cover their body. In addition, each person has a personality, a culture, and a place in society to show to other people. For all these reasons, people wear clothing.

Clothing Materials

Early humans made clothing from the skins and fur of animals. When humans



Women wore long dresses and big hats in about 1900.

began to settle in villages and to grow crops, they started making cloth from natural fibers. Such fibers as silk and wool came from animals. Cotton and flax were common plant fibers.

Late in the 1800s a French chemist created the first artificial fabric. He made an artificial silk out of a plant fiber that had been turned into liquid form. This is now called rayon. In the 1930s scientists made an even more useful material from petroleum, or oil. It is called nylon. Rayon, nylon, and other materials made from chemicals may be stronger and less likely to wrinkle or shrink than natural cloth.

Clothing Styles

Clothing styles depend on the climate of a region. People in a tropical rain forest need little or no clothing. In the hot deserts of the Middle East and North Africa, people wear loose white robes for protection against the sun. In the Arctic, where it is very cold, the Inuit wear warm furs and waterproof sealskin. In many other regions the weather may be hot or cold, depending on the season. People in these regions must have both light and heavy clothing.

People also wear clothing to tell others about themselves. Uniforms show which people are soldiers and police officers. Women sometimes wear different colors and styles than men do. Young people may wear unusual clothes to rebel against their parents. Rich people wear expensive clothes made by famous designers. Religion and culture affect clothing styles as well. Despite these



Young people of the late 1980s and early 1990s wore flannel shirts and ripped jeans.

differences, international business, travel, movies, and television have helped to spread similar styles around the globe. Jeans, for example, are popular almost everywhere.

► More to explore

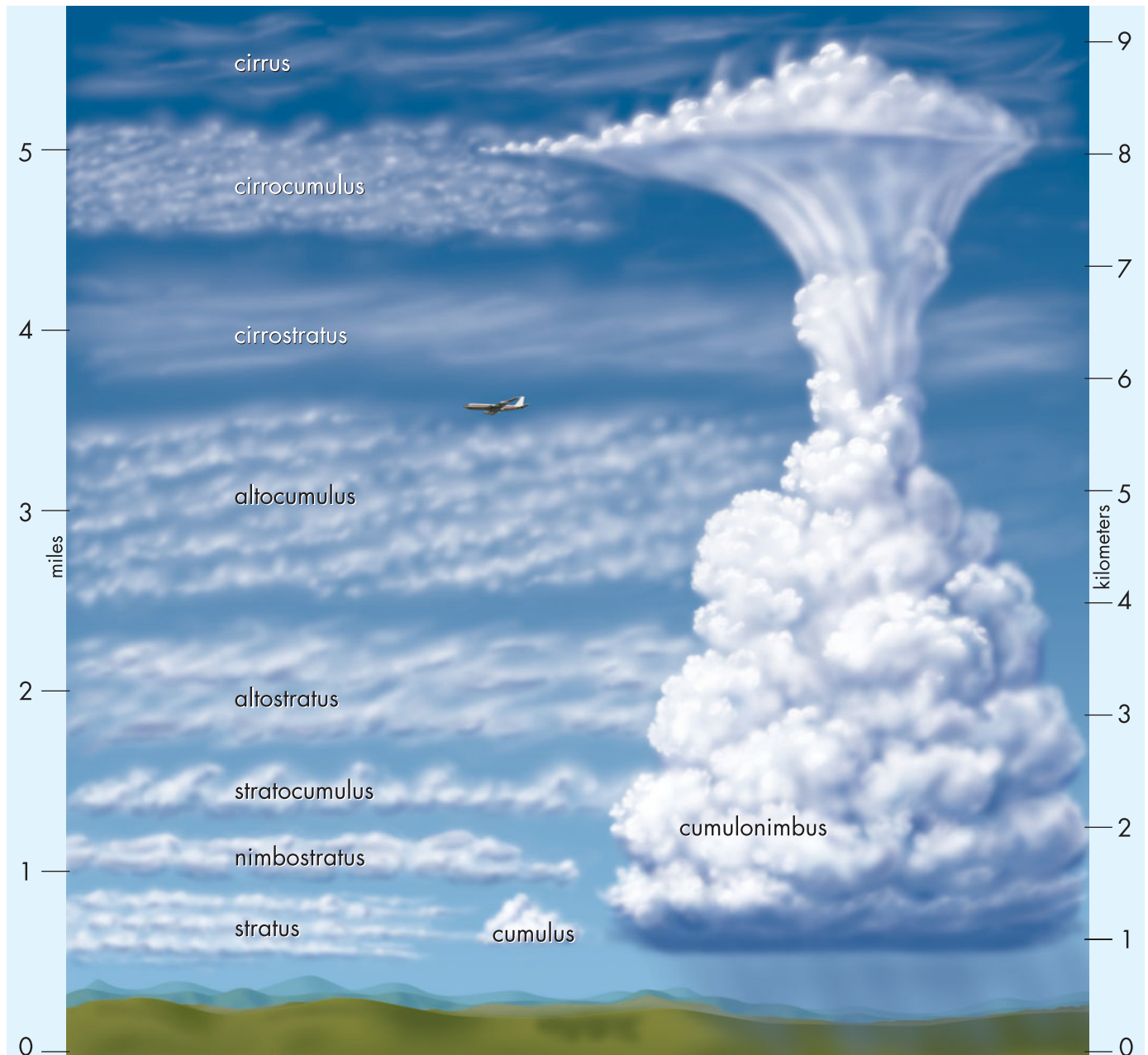
Climate • Culture • Fibers

Cloud

On a sunny day a wispy cloud can be a beautiful sight, but at other times a cloud can be a sign of storms to come. A



Wispy cirrus clouds drift high in the sky.



Different types of clouds form at different heights.

cloud is made up of millions of tiny water droplets or ice crystals floating together in the air.

The air always contains water vapor—water in the form of gas—which is invisible. The amount of water vapor that air can hold depends on the air's temperature. The cooler the air, the less water it can hold. When air cools, some of the

water vapor condenses, or forms visible water droplets. The droplets form around tiny particles in the air, such as dust or sea salt. Near the ground, the condensed water vapor becomes fog. Up in the sky, it forms clouds.

Air cools as it rises, so clouds form when warm, moist air rises. Air is forced upward when it blows against a moun-

Did You Know?

In the summer, small cumulus clouds that appear in the morning often turn into dark cumulonimbus clouds during the day.

tain inside. Air is also forced to rise when the land gets very hot. Sometimes clouds form when a cold air mass meets a warm, moist air mass. The warm air rises up over the cold air, causing the warm air to cool and clouds to form. Once clouds have formed, they will remain until the air is warmed or rain falls.

Meteorologists (people who study weather) classify clouds mainly by their appearance. The three main types of clouds are cirrus, cumulus, and stratus. Cirrus clouds are high, thin clouds made up of ice crystals. Cumulus clouds are puffy clouds that are often piled up like a mountain. Stratus clouds are layered. Scientists combine these terms with others—including “nimbus,” meaning rain—to describe 10 different cloud types. For example, cumulonimbus clouds are huge piled-up clouds that produce thunderstorms.

Coal

The major source of fuel throughout the world is coal. Coal is a black or brown rock that, when burned, releases energy in the form of heat. One of coal’s main uses is the production of electricity.

How Coal Formed

The coal used today began forming about 300 million years ago. At that time swamps with giant ferns and other plants were common on Earth. When these plants died, they sank in the water. They did not completely decay, or break down. Instead they formed a substance called peat. Over time layers of rock and

other materials built up over the peat. Heat and pressure hardened the peat into coal.

Forms and Uses of Coal

Coal has several different forms. Anthracite is hard coal. It produces the greatest amount of heat and is used mainly for heating homes. Bituminous coal is soft. Power plants use it to produce electricity. Bituminous coal is also used in steel mills to make coke, another kind of fuel. Lignite, the softest coal, is used to produce gas and electricity.

Coal Mining

People get coal by mining. In one process, called strip mining, miners take coal from just below the surface. In deep mining, miners dig long tunnels to get to coal that is buried far underground.

Mining coal can be dangerous for the miners. Coal miners can be injured or



Huge piles of coal wait to be shipped from a port in Poland.

killed when mine roofs collapse. Gases trapped in coal sometimes cause fires or explosions. Many miners have health problems from breathing in coal dust over the years.

Disadvantages of Coal

Compared to other energy resources, coal is inexpensive and plentiful. However, coal has several disadvantages. Burning coal can create acid rain, a dangerous form of pollution. Burning coal also increases the temperature of Earth's atmosphere, which may be harmful to living things. Finally, because coal takes so long to form, it is known as a nonrenewable resource. Eventually, Earth's supply of coal will run out.

► More to explore

Energy • Fossil Fuel • Mining
• Pollution

Cobra

Cobras are poisonous snakes that flatten their necks into the shape of a hood when they sense danger. There are several species, or types, of cobra. Not all of them are closely related.

Cobras live in the southern parts of Asia and Africa. Some types dwell in grasslands, forests, or deserts. Others live in trees or along the shores of lakes.

Cobras are usually a single color or spotted. They are medium to large in size. The king cobra of Asia is the world's longest poisonous snake. It can reach a length of about 18 feet (5.5 meters).



A black-necked cobra spreads its neck to create a hood.

When a cobra feels threatened, it raises up its head and extends the ribs in its neck. This stretches the skin to create the hood. Some types of cobra have markings on the hood.

Cobras hunt in the evening and at night. Their prey includes mammals, birds, snakes, lizards, frogs, and even fish. When cobras bite, their short front fangs deliver venom, or poison, into the prey. Some types of cobra can also spit a stream of venom at the eyes of intruders.

Some types of cobra lay eggs. Others give birth to live young. The king cobra builds a nest for its eggs. It also guards the eggs until they hatch.

► More to explore

Poison • Snake

Cochise

Cochise was a chief of the Chiricahua band of the Apache people. In the 1860s he led a fierce fight to hold onto Apache



Cochise

lands in what is now the southwestern United States.

Nothing is known for certain of Cochise's birth or early life. He was probably born in about 1810. Through the 1850s his people enjoyed good relations with the U.S. government. The peace was broken in 1861, when some Apache stole a white rancher's cattle and kidnapped the son of a ranch hand. A U.S. Army officer thought Cochise was responsible and put him in prison along with several other chiefs. Cochise escaped, but the rest of the prisoners were killed.

Cochise wanted revenge. Under his leadership the Apache drove U.S. troops and settlers from their land in what is now southern Arizona. In 1863 U.S. troops killed Mangas Coloradas, a powerful Apache leader and Cochise's

father-in-law. Cochise then became the main Apache chief. He led raids against U.S. soldiers and settlers from the Arizona mountains until surrendering in 1871. He escaped in 1872, but he soon returned to Arizona and settled on the newly created Chiricahua Reservation. He died there on June 8, 1874.

► More to explore

Apache

Cockroach

Cockroaches are insects that have lived on Earth for more than 320 million years. There are more than 3,500 different species, or types, of cockroach. Most live in forests in warm areas. However, some cockroaches live in warm, dark areas of houses, apartment and office buildings, airplanes, and ships. Cockroaches are among the most hated household pests.

Cockroaches have a flat, oval body that is black or brown. For insects, they are quite large. The common American



Cockroaches are considered pests because they eat people's food and carry diseases.

cockroach can grow to about 2 inches (5 centimeters) long. Like all insects, cockroaches have a hard shell called an exoskeleton. The exoskeleton protects their soft body parts. Cockroaches have long legs that allow them to run very fast. Many cockroaches also have wings.

Cockroaches have well-developed senses. They have long antennae and compound eyes (eyes with many parts), which help them to hunt in near darkness. A pair of small hairs on their backside, called cerci, can sense the slightest movement.

Cockroaches in the wild eat rotting plants and animals. In cities cockroaches hide in the daytime and come out at night to eat. They eat food scraps, paper, clothing, and dead insects. Sometimes the food they eat gives them a bad smell. Cockroaches also spread several human diseases.

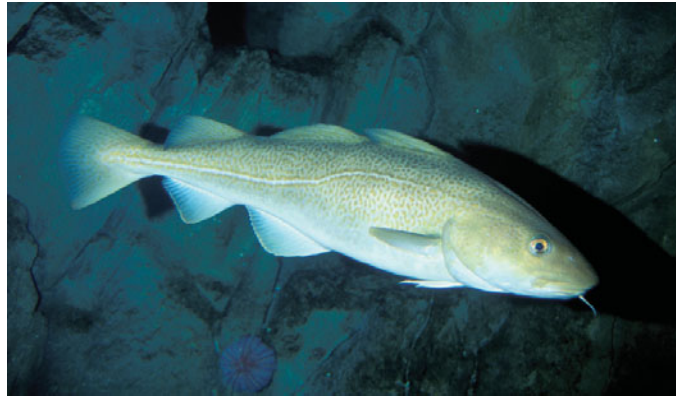
► More to explore

Insect

Cod

The fish called cod are important sources of food. People eat cod flesh as well as the oil in their livers. Cod-liver oil is very rich in vitamins A and D and other things that people need to stay healthy.

Cod live in the cold waters of the northern Atlantic and Pacific oceans. Other cold waters, such as the North Sea in Europe, are also home to these fish.



Cod are gray-green fish with speckles. They also have a white line on their sides.

The bodies of Atlantic cod are dull gray or green with speckles. Atlantic cod may also be reddish in color. A white line curves from head to tail along each side. Although smaller than Atlantic cod, Pacific cod look very much like their Atlantic relatives.

One unusual physical feature of the cod is its barbel. The barbel is a thin tentacle that hangs from the cod's lower jaw. Scientists think this organ may be a tool for finding small crabs or other food hiding in the sand.

Fishers prefer to catch cod that are 2 to 4 feet (0.6 to 1.2 meters) long. Fish this size usually weigh 10 to 25 pounds (4.5 to 11.5 kilograms). Cod that escape being caught may grow to be 6 feet (1.8 meters) long and more than 200 pounds (90 kilograms) in weight.

A female cod may lay as many as 8 million eggs. Ocean currents carry the eggs over large areas.

► More to explore

Fish

Cody, William Frederick



William Frederick Cody

William Frederick Cody—better known as Buffalo Bill—was a folk hero of the American West. Novelists wrote about his adventures as an Army scout and buffalo hunter. He also produced a famous show about the Wild West.

Cody was born in Iowa on February 26, 1846. He grew up in Kansas. At age 14 he started working for the Pony Express, a service that delivered mail on horseback.

In the 1860s Cody served in the American Civil War and scouted for the U.S. Army. As a scout he roamed around to gather information about the Native Americans. He also hunted buffalo (bison). He got the nickname Buffalo Bill for shooting thousands of buffalo to feed railroad workers.

From 1872 to 1883 Cody acted in plays about the West. He also guided the U.S. cavalry in 1874 and fought for the Army against the Sioux in 1876.

In 1883 Cody started his Wild West show—later known as Buffalo Bill's Wild West and Congress of Rough Riders of the World. The show featured trick riding, sharpshooting, and a buffalo hunt. It toured the United States and Europe for 30 years.

Cody used the money he made from his show to buy land in Wyoming. There he helped found the town of Cody. He died in Denver, Colorado, on January 10, 1917.

► More to explore

Pony Express

Coeur d'Alene

The Coeur d'Alene tribe of Native Americans traditionally lived in what is now northern Idaho and eastern Washington. Their name was given to them by French traders, but they called themselves the Schitsu'umsh. The name means "the discovered people."

Most of the year they lived in villages in permanent cone-shaped houses covered with bark and woven mats. They fished for salmon, hunted game animals, and gathered wild plants for food.

In the 1700s the Coeur d'Alene obtained horses for the first time. The men began making trips to the western plains on horseback. There they hunted



Morris Antelope was a chief of the Coeur d'Alene people.

bison (buffalo) and traded with Plains Indian tribes.

The Coeur d'Alene did not want traders to enter their lands. However, they did trade furs for metal tools, guns, and other manufactured goods.

Like many other Native American tribes, the Coeur d'Alene suffered from diseases brought by European settlers. Smallpox killed many people in the first half of the 1800s.

In the mid-1800s the Coeur d'Alene tried to resist settlers who wanted to take over their territory. In 1858 a force of 1,000 Coeur d'Alene, Spokane, and Palouse warriors fought a brief and unsuccessful war against United States troops. Following this defeat, the U.S. government moved the Coeur d'Alene

to a reservation in what is now Idaho. At the end of the 20th century about 1,500 Coeur d'Alene lived in the United States.

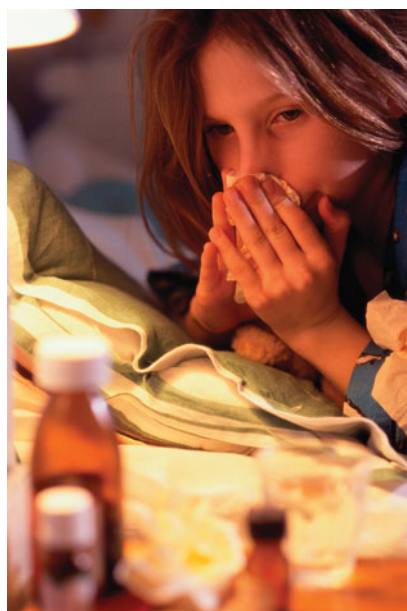
► More to explore

Native Americans • Smallpox

Cold, Common

The cold is one of the most common illnesses to affect humans. In fact, children may get 6 to 10 colds a year. People often catch colds during cold weather, but chilly temperatures are not the cause. Viruses, or tiny germs that enter the body, cause colds. More than 200 different viruses can cause a cold.

The symptoms, or signs, of a cold generally start two or three days after a cold virus enters the body. Symptoms may include a runny or stuffy nose, sneezing, coughing, sore throat, and headache.



More than 200 different viruses can cause the common cold.

The symptoms last from a few days to two weeks.

Cold viruses spread easily from person to person. Coughing and sneezing force a cold virus into the air. People may then breathe in the virus. They may also pick up a virus by touching surfaces where viruses have landed. Then when they touch their noses, the virus enters the body. Washing one's hands may help to prevent the spread of cold viruses.

There is no cure for the common cold. Treatment includes resting and drinking lots of water, juice, or soup broth. Steam from a hot shower or a vaporizer can make breathing easier. Saltwater nose drops can also help a stuffy nose. Cough drops can soothe a sore throat. Pain-relieving medicine can ease a headache.

► More to explore

Disease, Human • Virus

Cold War

After World War II the United States and the Soviet Union were the superpowers of the world. They became rivals as they each sought to prevent the other from gaining too much power. The period of tension that existed between them came to be known as the Cold War. The conflict did not result in actual war between the two countries. However, it did lead to a number of smaller wars.

Background

During World War II, the Soviet Union freed many countries of eastern Europe from Nazi Germany. After the war, how-



In 1962 a U.S. ship (left) stops a Soviet ship carrying missiles out of Cuba.

ever, the Soviet Union continued to control the countries. It also forced its own Communist economic system on them.

The United States did not want Communism to spread to other countries in Europe. It also wanted the western European countries as allies, or friends. The United States therefore gave money to those countries to rebuild after the war. This was called the Marshall Plan. It was named for George Marshall, the American who proposed the plan.

Alliances

In 1949 the United States and its European allies formed the North Atlantic Treaty Organization (NATO) to protect each in case of attack. The Soviet Union and its allies formed their own alliance, the Warsaw Pact, in 1955.

Events of the Cold War

Two major crises of the Cold War involved the German city of Berlin. At the end of World War II the city, as well as the country, was divided into four zones. The United States, Britain,

Did You Know?

During the Cold War people in the United States built special shelters to protect themselves from nuclear war.

France, and the Soviet Union each controlled one of the sectors. In 1948 the three Western powers announced that they would combine their zones. The Soviet Union then cut off road and rail supply routes to the city, which was completely within the Soviet part of Germany. In response, the United States and Britain delivered supplies by airplane. This was the Berlin airlift. The Soviet Union lifted its blockade in May 1949.

In the years that followed, many people in East Berlin moved to West Berlin to escape control by the Soviet Union. In 1961 the Soviet Union tried to stop this movement by building a wall around West Berlin. The Berlin Wall became a symbol of the Cold War.

The Cold War soon extended beyond Europe. The Soviet Union gave support

to other countries throughout the world that had Communist governments. At the same time, the United States tried to prevent Communism from spreading any further. Both the Korean War in the 1950s and the Vietnam War in the 1960s and '70s were part of that struggle.

Other battles took place in the countries of the Western Hemisphere. In 1959 Fidel Castro established a Communist government in Cuba. In 1962, after spotting nuclear missiles on Cuba, the United States cut off supplies to the island. After several tense days of the Cuban Missile Crisis, the Soviet Union agreed to remove the weapons.

End of the Cold War

In the 1970s the United States and the Soviet Union signed agreements to limit the number of nuclear weapons that they each had. Other changes took place when Mikhail Gorbachev took power in the Soviet Union in 1985. He tried to reorganize the economic system and encouraged glasnost, or open discussion. In 1989 the Berlin Wall was torn down. The Warsaw Pact was dissolved in July 1991, and later that year the Soviet Union itself broke up into 15 separate nations. Communist rule ended in many countries, bringing an end to the Cold War.

► More to explore

Berlin • Communism • Cuba • Korean War • North Atlantic Treaty Organization • Union of Soviet Socialist Republics • United States • Vietnam War



People from East Berlin and West Berlin gather at the Berlin Wall on November 10, 1989. The wall had been opened the day before.



Colombia

Colombia is the only country named after Christopher Columbus. He sailed near its Caribbean shores in the late 1400s. Colombia is located in northwestern South America. The capital is Bogotá.

Geography

Colombia shares borders with Venezuela, Brazil, Peru, Ecuador, and Panama. The Caribbean Sea lies to the north, and the Pacific Ocean is to the west.

Three ranges of the Andes Mountains cut through the western half of Colombia. In the east, tributaries of the Amazon and Orinoco rivers cross a vast plain. The country's most important river is the Magdalena, which flows north into the Caribbean. The climate is generally tropical, with warm temperatures year-round.



Plants and Animals

Colombia has areas of mangrove swamp, desert scrub, savanna grasslands, and tropical rain forest. Its animal life includes jaguars, tapirs, armadillos, ocelots, deer, monkeys, and rare spectacled bears. Colombia has more than 1,500 kinds of birds, ranging from the huge Andean condor to the tiny hummingbird. Turtles, piranhas, crocodiles, and electric eels live in the country's waters.

People

Nearly half of Colombians are mestizos, or people with mixed European and Native American roots. About one fifth of the people have mixed African and European roots. About the same number of people are white. There are smaller groups of blacks and Native Americans. Spanish and various Indian languages are spoken. Most of the people are Roman Catholics. More than three fourths of Colombians live in cities, mostly in the west.

Economy

Colombia's economy is based on banking and other services, agriculture, and manufacturing. Major crops include sugarcane, potatoes, rice, bananas, corn, and coffee. Some people illegally grow coca and marijuana plants, which are made into drugs. Colombia is also an important cattle-producing country. Factories make food products, beverages, textiles, chemicals, and machinery.



Many coffee plants grow on a plantation, or large farm, in Colombia. Coffee is one of Colombia's main crops.

Colombia is rich in natural resources, including oil, natural gas, coal, nickel, gold, and emeralds. Oil is the top export.

History

The first people to live in what is now Colombia were Native Americans. The most important group was the Chibcha. The Spanish explorers who followed Columbus began to conquer the area in 1525. The Spanish called the region the Kingdom of New Granada. They forced their language, religion, customs, and laws on the Indians.

Late in the 1700s the Spanish colonists in New Granada began to rebel against Spanish rule. In 1819 New Granada gained its independence. It became a republic known as Gran Colombia, which included what are now Colombia, Panama, Venezuela, and Ecuador. In 1830 Venezuela and Ecuador left the republic.

Colombia's political parties, the Conservatives and the Liberals, soon began fighting. The conflict reached its peak in the War of a Thousand Days, which lasted from 1899 to 1903. After the war Panama gained independence from Colombia.

Political violence broke out again in 1948. In nine years of civil war about 300,000 Colombians died. In 1957 the Conservatives and the Liberals agreed to share power. That agreement lasted until 1974. Since then Colombia has suffered from violence. Much of the violence has been caused by rebel political groups and illegal drug traders.

► More to explore

Andes • Bogotá • Columbus, Christopher



A church in Colombia was built on a bridge overlooking the Guaitara River.

Facts About COLOMBIA



Population
(2008 estimate)
44,442,000

Area
440,762 sq mi
(1,141,568 sq km)

Capital
Bogotá

Form of government
Republic

Major cities
Bogotá, Cali,
Medellín,
Barranquilla

Colombo



Population
(2004
estimate), city,
669,700; urban
area,
2,490,300

Colombo is one of the two capitals of Sri Lanka, an island country in the Indian Ocean. The offices of the president and prime minister of Sri Lanka are in Colombo. The country's supreme court and lawmakers meet in a nearby suburb named Sri Jayewardenepura Kotte.

Colombo is Sri Lanka's largest city. It is also the business center and leading port. Many people in the city work in government offices, banking, or insurance. Colombo's factories assemble cars and process foods, drinks, and tobacco.



Some of Colombo's buildings were built during the years of British rule. Others are modern towers.

In ancient times Colombo was a major port for the spice trade. In 1815 the British took control of the island. Colombo was their capital. Sri Lanka became an independent country in 1948. For many years Colombo was the country's only capital. In the late 1970s the government decided to transfer many departments to the nearby suburb.

► More to explore

Sri Jayewardenepura Kotte • Sri Lanka

Colony

A colony is a group of people from one country who build a settlement in another territory, or land. They claim the new land for the original country, and the original country keeps some control over the colony. The settlement itself is also called a colony. The practice of setting up colonies is called colonialism. A collection of many colonies is called an empire.

Before about 1950 a small number of countries controlled many colonies around the world. But the people in the colonies slowly gained independence as separate countries. Today few colonies are left.

Kinds of Colonies

Colonies are sometimes divided into two types: settlement colonies and colonies of occupation. People often formed settlement colonies in places where few other people lived. Ordinary people moved to a settlement colony to set up farms or run small businesses. The colonies that the English and other Europe-



A drawing shows the colony of Sydney, Australia, in 1788. The British set up the colony as a place to send prisoners.

ans established in North America beginning in the 1500s were settlement colonies.

Countries set up colonies of occupation by force. That is, a country conquered a territory, and then people from that country moved in to control it. Often only a few wealthy people settled in this kind of colony. India is an example of a colony of occupation. Great Britain controlled India from the 1800s until 1947.

Why People Set Up Colonies

One of the reasons countries formed colonies was to make money. Countries used colonies to control trade between their territory and the rest of the world. They also set up colonies to take advantage of natural resources in new lands. They took precious metals, timber, and furs from the territories and sold them to make money for themselves.

Another reason countries set up colonies was to increase their military power. They often set up bases for their armies and navies in their colonies.

Still other colonies were founded as prisons. Great Britain set up colonies in Australia as places to send its criminals.

► More to explore

Americas, Exploration and Settlement of the • Empire

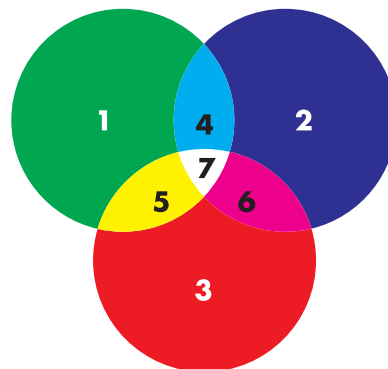
Color

Without light, there is no color. When people see colors, they are really seeing different types of light bouncing off objects.

Color and Light

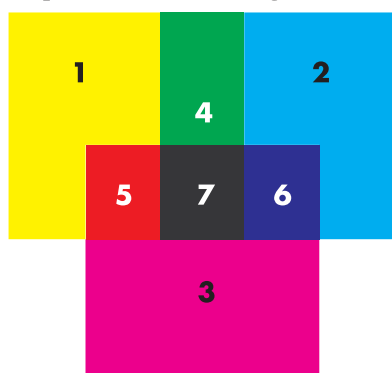
Light travels in waves. Scientists use an idea called wavelength to describe these waves. Some light waves have long wavelengths, while others have short wavelengths. Light of different wavelengths appears as different colors. For example,

Primary Colors of Light



Green (1), blue (2), and red (3) are the primary colors of light. A mixture of two primary colors of light can make cyan (4), yellow (5), or magenta (6). A mixture of all three makes white (7).

Primary Colors of Pigments



Yellow (1), cyan (2), and magenta (3) are the primary colors of pigments, or inks. A mixture of two primary colors of pigments can make green (4), red (5), or blue (6). A mixture of all three makes black (7).

red light has a long wavelength, and violet light has a short wavelength. Normally all the wavelengths, or colors, travel together as white light.

When white light passes through a special piece of glass called a prism, the light bends. Shorter wavelengths bend more than longer wavelengths. This bending causes the white light to separate into the colors of the rainbow.

White light also separates into different colors when it strikes objects. For example, when white light strikes a ripe tomato, mostly red wavelengths reflect, or bounce, off the tomato. The tomato absorbs, or takes in, all the other colors. This causes the tomato to look red.

Mixing Colors

Three colors of light—red, blue, and green—can combine to make any other color. For example, if a beam of green light shines over a beam of red light, yellow light appears. Red, blue, and

green are called primary colors of light. Mixtures of the primary colors of light produce all the other colors.

To make colors appear in printed books, people use inks. Inks, paints, dyes, and crayons get their color from pigments, or substances that reflect certain colors of light. The three primary colors of pigments are magenta (a purplish red), yellow, and cyan (a blue-green). Different mixtures of these colors can make all other colors. For example, mixing cyan ink and yellow ink makes green ink.

Seeing Color

Cells in the eyes called cones make it possible for humans to see color. Different types of cones absorb different colors. Some people are color blind. This does not necessarily mean that they cannot see any color at all. More commonly, people with color blindness think certain colors, such as red and green, look the same.

Colors can tell animals about their surroundings. Color attracts insects to flowers where they can get food. It can show when fruits are ripe and ready to eat. Color can also help certain plants and animals survive. For example, some animals have colors that are similar to the habitat in which they live. This helps them hide from other animals that may want to attack them.

► More to explore

Light • Prism • Protective Coloration
• Rainbow

Colorado

The state of Colorado got its name from the Spanish word meaning “red.” Spanish explorers gave the name to the Colorado River because of its brightly colored water, and later the name was used for the land as well. Colorado is nicknamed the Centennial State because it joined the Union in 1876—100 years after the signing of the Declaration of Independence. Denver is the state’s capital and largest city.

Geography

Colorado is in the western United States. It borders Nebraska on the north-east, Wyoming on the north, Utah on the west, New Mexico and Oklahoma on the south, and Kansas on the east.

The Rocky Mountains cover about half of Colorado, stretching from the north-west to the south-central part of the state. The highest peak is Mount Elbert at 14,433 feet (4,399 meters). Eastern Colorado is part of the Great Plains. Much of western Colorado is an area of flat-topped hills (mesas) and steep-walled canyons.

People

More than four fifths of Colorado’s residents are whites of European descent. Hispanics, mainly Mexicans, make up the largest minority. The numbers of African Americans and Native Americans are small. Members of the Ute tribe live on two reservations in the southwest.

Most of Colorado’s people live along the eastern edge of the mountains, an area of towns and cities that runs from Fort Collins in the north to Pueblo in the south. Denver, Boulder, Greeley, and Colorado Springs are major cities in this area.

Economy

Mining and agriculture have been major parts of Colorado’s economy since the frontier days. Today the state’s mineral wealth includes petroleum (oil), coal, molybdenum, sand, and gravel. The largest source of farm income is cattle raising, though many sheep and hogs also are raised. The main crops are wheat, hay, and corn.

Tourism, manufacturing, and high-technology industries became valuable in the 1900s. Major manufacturing industries include food processing and



Facts About COLORADO

Flag



Population

(2000 census)
4,301,261—
rank, 24th state;
(2008 estimate)
4,939,456—
rank, 22nd state

Capital

Denver

Area

104,094 sq mi
(269,601 sq
km)—rank, 8th
state

Statehood

August 1, 1876

Motto

Nil Sine Numine
(Nothing Without
Providence)

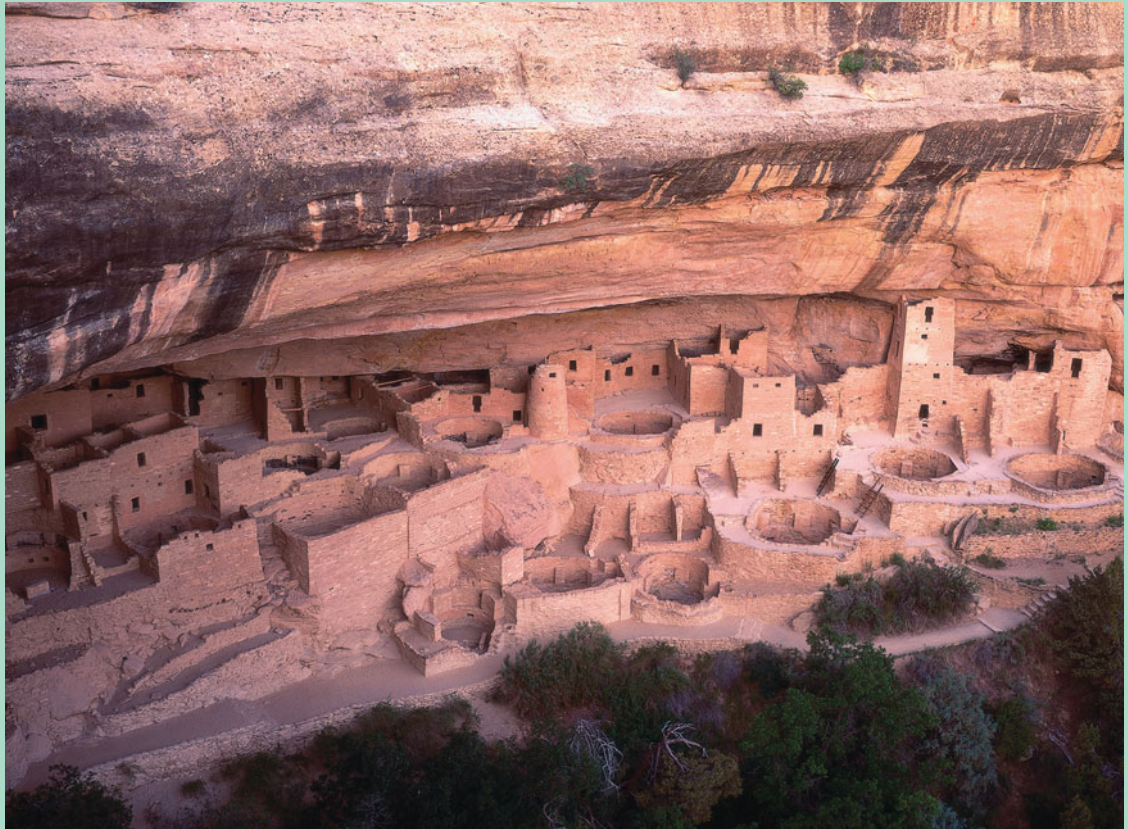
State bird

Lark bunting



State flower

Rocky Mountain
columbine



The Cliff Palace in Mesa Verde National Park, Colorado, has about 200 rooms. The Anasazi people built the cliff dwellings about 800 years ago.

the production of computer and electronics equipment, metals, and military weapons.

History

Native Americans known as the Anasazi lived in the Colorado area from about AD 100 to 1300. Mesa Verde National Park in southwestern Colorado preserves ruins of their cliff dwellings. Spaniards first explored the area in the mid-1500s. Spanish and French explorers who visited in the 1700s met Plains Indian tribes such as the Cheyenne, the Arapaho, the Comanche, and the Kiowa.

In 1803 the United States bought the plains portion of Colorado as part of the Louisiana Purchase, a land deal with

France. The United States took control of much of the rest of Colorado after winning a war against Mexico in the mid-1800s. After gold was discovered in 1859, miners and other settlers arrived from the East. The U.S. Congress created the Colorado Territory in 1861. In 1876 Colorado became a state.

During World War II the U.S. government began building military bases and other facilities in Colorado. Many of the people who came to Colorado for work stayed after the war. Later, the creation of ski resorts helped make tourism a leading industry.

► More to explore

Anasazi • Colorado River • Denver
• Rocky Mountains

Colorado River

The Colorado River flows from Colorado southwest through the Rocky Mountains and into Mexico. There it drains into the Gulf of California, an arm of the Pacific Ocean. The river's most famous landmark is the Grand Canyon in Arizona. The mighty flow of the Colorado River carved out this huge canyon millions of years ago.

The Colorado River begins as a series of small streams in northern Colorado. For much of its length of 1,450 miles (2,330 kilometers), it is only a narrow passage through deserts. By the time it gets to the ocean, nearly all of its water has been used up.

People use much of this water. The river has several dams. It is connected to many canals. Along its course, a number of power plants use the water to create electricity. But the Colorado also loses more water through evaporation than it receives from rivers that flow into it.



The Colorado River cuts through Marble Canyon in Grand Canyon National Park.

Elk, bear, and moose are some of the many animals living along the Colorado River. Many different kinds of fish swim in its waters. The plants that grow near the river include cottonwood trees, columbine flowers, and prickly pear cacti.

Long before Europeans arrived in the area, Native American groups farmed along the Colorado River. Their farms were some of the earliest in North America. Spanish explorers discovered the lower Colorado River in the 1500s.

Many people today argue over how the Colorado River should be used. Several Western states and Mexico need its waters. This competition has led to legal battles. The ways in which people use the water have also created problems. One such problem is that the power plants and other human projects have polluted the water.

► More to explore

Canal • Dam • Grand Canyon

Columbia



Population
(2000 census),
city, 116,278;
(2007 estimate)
124,818

Columbia is the capital of the U.S. state of South Carolina. The city lies in the center of the state on the Congaree River.

Columbia is a center for supplying goods to surrounding areas. Factories in the city make cloth, steel, electrical equipment, and other products. Many people work for the government or in education. The University of South Carolina and several other universities are located there.

In 1786 the state government decided to move the capital from Charleston. Columbia was built to be the new capital. In the 1860s, during the American Civil War, many Confederate offices



Columbia, South Carolina, is a historic city with many old buildings.

were located in Columbia. In 1865 Union troops took over the city. A fire then almost destroyed Columbia. After the war the city was rebuilt.

► More to explore

South Carolina

Columbia River



The Columbia River is a major river that flows through Canada and the northwestern United States. The Columbia is about 1,240 miles (2,000 kilometers) long. It empties into the Pacific Ocean.

So many dams have been built along the Columbia that it has been called the Electric River. Dams produce hydroelectric power, or electricity that comes from intense water pressure. Together the Columbia River dams create almost one third of the hydroelectric power produced in the United States.

The Columbia River begins in Columbia Lake, in the Rocky Mountains in British Columbia, Canada. It passes

through the mountains and flows south into Washington State. In southern Washington the river turns west. It then flows to the Pacific while forming the border between Washington and Oregon. In this area it passes through the Cascade Mountains, where it forms the deep Columbia River Gorge.

Near the river's mouth heavy rains help evergreen forests grow. Farther inland the climate is drier. Pine, fir, and larch trees grow in the mountains where the river starts.

The Columbia was once filled with salmon. Now their numbers are greatly reduced. The dams have caused this change. But millions of water birds live in the surrounding wetlands. Deer, bears, and bighorn sheep are also common along the Columbia.

Native Americans have lived along the Columbia for centuries. European explorers first saw the river in 1775. The Lewis and Clark Expedition followed

part of the river in 1805 after the United States claimed the area.

► More to explore

Dam • Lewis and Clark Expedition

• River

Columbus



Population
(2000 census),
city, 711,470;
(2007 estimate)
747,755

Columbus is the capital of the U.S. state of Ohio. It is the largest city in the state. The Scioto River flows through the downtown area.

Many people in the city work for the government. Others work in banking, insurance, health care, research, or education. Ohio State University and several colleges are in Columbus. Factories in the city make cars and machinery.

Columbus was built in the early 1800s to be the new capital of Ohio. The state government offices were moved there from Chillicothe by 1816. The city grew as a transportation center.

In the years before the American Civil War Columbus was a place where escaped slaves could go to for safety and help. During the war captured Confederate soldiers were kept as prisoners in a camp in the city.



The Columbia River passes through the Cascade Mountains, where it forms the Columbia River Gorge.



The city of Columbus, Ohio, overlooks the Scioto River.

Many new factories were built in Columbus after 1940. The city began to grow greatly in the late 20th century.

► **More to explore**
Ohio

Columbus, Christopher

Christopher Columbus opened the world of the Americas to his fellow Europeans. Europeans called Vikings had reached the Americas hundreds of years before Columbus first arrived there in 1492. However, the Vikings did not establish long-lasting settlements. Columbus explored the area and brought back more Europeans with him on later trips. Columbus' voyages therefore had many more lasting effects.

Columbus began an unstoppable wave of European settlement in the Americas. This settlement brought European culture to the Western Hemisphere. It also brought great hardship to the Native Americans there. They suffered from

diseases brought by the Europeans. They were also enslaved and forced to mine gold for the Europeans.

Early Life

Cristoforo Colombo was born in Genoa, Italy, in 1451. He is known as Christopher Columbus to English-speaking people. He was the son of a weaver and had little schooling.

In about 1476 Columbus settled in Portugal. In the 1480s he started planning a voyage to discover a sea route to Asia. Europeans were eager for Asian goods. However, these goods were costly because they had to be brought to Europe over a dangerous land route. Columbus knew that Earth was round. He thought that Asia must lie to the west, across the Atlantic Ocean.

The Portuguese king refused to pay for Columbus' voyage. Columbus then



Christopher Columbus

turned to King Ferdinand and Queen Isabella of the Spanish kingdoms of Aragon and Castile. In January 1492 they agreed to support the expedition. They provided three ships: the *Niña*, the *Pinta*, and the *Santa María*.

First Voyage

On August 3, 1492, the ships set sail. On October 12, Columbus reached the Bahamas, an island group east of Florida. He thought he had reached the East Indies in Asia. Columbus therefore called the islanders Indians.

Columbus reached Cuba on October 29. On December 6 he reached the island of Hispaniola. He built a fort on the island and left some men there. In January he returned to Spain. He took with him parrots, plants, gold, cloth, and several Native Americans.

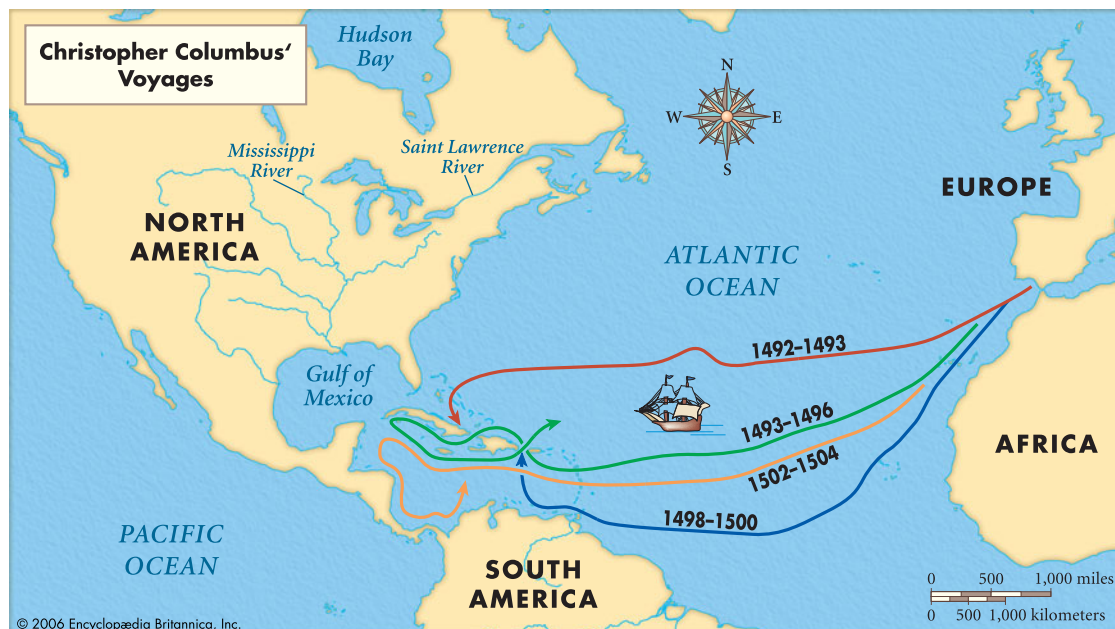
Later Voyages

Ferdinand and Isabella were pleased with Columbus and his discoveries. They

soon sent him back for a second trip. On his second voyage, from 1493 to 1496, Columbus had 17 ships and about 1,300 men. He found that the men he had left behind on Hispaniola had been killed. He then started a new colony and explored island coasts. He left his brothers in charge of the new colony when he returned to Spain.

On the third voyage, from 1498 to 1500, Columbus explored the Caribbean coast of South America. During this time, many people in the Hispaniola colony became angry with the rule of Columbus and his brothers. They complained to Spanish authorities. Columbus was eventually arrested and sent back to Spain in chains.

Upon his return, however, he was freed. He convinced Ferdinand and Isabella that he would find them treasures if he was allowed to return to the Americas. Columbus' last trip started in 1502. He explored the Central American coast but



lost all four of his ships. He had to be rescued.

Last Years

Columbus returned to Spain in November 1504. He died on May 20, 1506. Until his death he remained convinced that he had reached Asia.

► More to explore

Americas, Exploration and Settlement of the • Exploration • Ferdinand and Isabella • Native Americans

Comanche



Quanah Parker was a Comanche chief of the late 1800s and early 1900s.

The Comanche people are a Native American tribe that once roamed the southern Great Plains of North America. They were one of the first tribes to use

horses extensively. Horses eventually changed the way that all Plains Indians lived.

The Comanche were originally a branch of the Shoshone people of Wyoming. The Comanche moved southward in stages, attacking and displacing other Plains tribes.

The Comanche got horses from the Spanish in the 1600s. They became skilled horse breeders. The Comanche used their horses to hunt bison (buffalo). Their main source of food was bison meat, and they used the animals' hides for clothing and as coverings for their tepees.

During their travels the Comanche introduced the use of horses to other tribes. By the early 1800s the Comanche had become a powerful tribe.

In the mid-1800s the southern branch of the Comanche were settled on a reservation in the Indian Territory (now Oklahoma). The northern branch of the tribe fought to protect its hunting grounds against white settlers. Many people were killed in violent battles between the Comanche and U.S. troops. The Comanche lost most of their land.

In the late 20th century about 10,000 Comanche lived in the United States. About 3,000 of them lived on private lands in the area of Lawton, Oklahoma.

► More to explore

Native Americans • Shoshone

Combustion



A bomb explodes in military training. During an explosion air expands and moves outward with great force.

Combustion is a chemical reaction that produces heat and light. The most common form of combustion is fire. Most forms of combustion happen when the gas oxygen joins with another substance. For example, when wood burns, oxygen in the air joins with carbon in wood.

Many common substances can undergo combustion—for example, paper, cloth, and natural gas. Combustion begins when the substance reaches a temperature called its ignition point. At this temperature oxygen combines with the substance fast enough to produce a flame. Different substances have different ignition points. For example, the ignition point of paper is about 451°F (233°C).

A substance may reach its ignition point by being heated, struck by a spark, or exposed to strong light. For example, a hot match can raise the temperature of a piece of paper to its ignition point. A spark can do the same thing. So can sunlight that is focused through a magnifying glass.

Very fast combustion can cause an explosion. This type of combustion happens in a bomb or a firecracker. During an explosion air heats up so fast that it expands and moves outward with great force.

► More to explore

Bomb • Chemistry • Fire

Comet

A comet is a small chunk of dust and ice that orbits, or travels around, the sun. It is sometimes described as a “dirty snowball.” There are billions of comets in the solar system, but most never pass close by Earth. The best-known comet is



A shining comet streaks across the sky.

called Halley's Comet. It can be seen from Earth about every 76 years.

Orbit

Most planets orbit the sun in a path shaped like a circle. On the other hand, a comet's orbit is shaped like a long oval. Most comets travel very far into the outer solar system as they orbit. Depending on the comet, it can take from several years to many thousands of years to complete one orbit.

Earth passes through the orbit of some comets. Bits of dust left behind by the comets crash into the gases surrounding Earth. They burn up in the sky in what is called a meteor shower.

Parts of a Comet

The main part of a comet is called the nucleus. It is made of frozen water and gases plus dust and rock. The nucleus usually measures a few miles across.

Most of the time a comet consists of only its nucleus. However, when the comet gets close to the sun, the sun's heat causes it to shed gas and dust. A huge cloud of gas and dust called a coma builds up around the comet. The coma is sometimes larger than Earth. It makes the head of the comet look blurry.

When a comet moves even closer to the sun it grows tails. This happens because the sun gives off energy and streams of particles. They push some of the coma's dust and gases out into long streams. Comet tails can be very long—as long as the distance from Earth to the sun. The

coma and tails last only while the comet is fairly close to the sun.

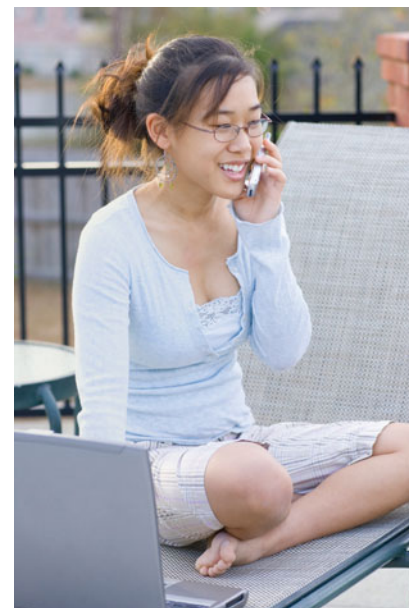
► More to explore

Meteor and Meteorite • Solar System
• Sun

Communication

People learn and share information through communication. All forms of communication have one thing in common: the sending and receiving of a message. Using different kinds of communication, people can pass along their ideas and feelings to just one person or to millions.

Communication is not only a human activity. Animals communicate through sounds, scents, and acts. Computers communicate with other computers through electronic networks.



People can quickly and easily communicate with one another over long distances using computers and cell phones.

Did You Know?

Halley's Comet passes by Earth every 76 years. It is named for Edmond Halley, an English astronomer who predicted one of its appearances.



Two songbirds—a female and a male—communicate with one another by singing. Birds can send a variety of messages, such as interest in mating, through their songs.

Kinds of Communication

People communicate through language, both spoken and written. Spoken language includes conversations and speeches. Written language includes books, newspapers, and e-mail.

People also communicate without words. Body and face movements show feelings. Deaf people use hand movements called sign language.

The arts are also a form of communication. Photographs, paintings, music, and movies can communicate feelings as well as facts.

History

The first modern humans appeared about 200,000 years ago. They likely used sounds, movements, and then speech. About 30,000 years ago humans started making paintings and sculptures on the walls of caves.

Humans invented writing more than 5,000 years ago. The ancient Sumerian people developed the first known script, called cuneiform. Then the ancient

Egyptians developed a picture-based writing called hieroglyphics. The invention of the printing press in the 1400s was a major advance in written communication. It let printers quickly make copies of a text.

Telecommunication is communication over long distances. In ancient times pigeons carried written messages. Before trains and cars, messengers on foot or on horseback carried letters. Public postal services started in the 1500s and 1600s. Since then, telecommunication has become faster thanks to television, telephones, and the Internet.

► More to explore

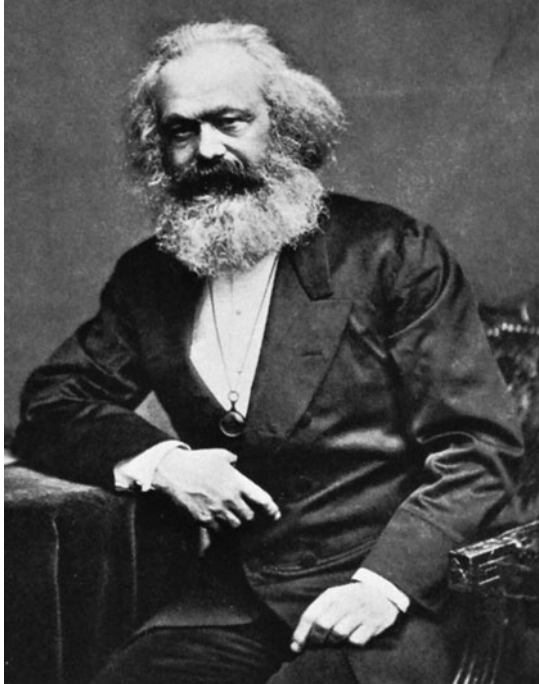
Arts • Language • Sign Language
• Telecommunication • Writing

Communism

Communism is a type of government as well as an economic system (a way of creating and sharing wealth). In a Communist system, individual people do not own land, factories, or machinery. Instead, the government or the whole community owns these things. Everyone is supposed to share the wealth that they create.

Karl Marx

By the 1800s many countries followed the economic system called capitalism. Under capitalism, individual people, called capitalists, own property and run companies. Some capitalists became rich but paid their workers very little. In response, many workers began supporting the ideas of socialism. In a socialist



Karl Marx is often called the Father of Communism.

system, the government owns companies and divides wealth more fairly among the people. Karl Marx, a German thinker of the 1800s, took socialist ideas one step further. Marx's ideas became the basis of Communism.

Marx called the workers the proletariat. Marx thought that some day the workers would lead a revolution and overthrow the capitalists. After taking control, the proletariat would become the new ruling class. At first there would be a "dictatorship of the proletariat" to defeat all opposition. Then a true Communist society would develop. This would include common ownership of property and no government. People would work to produce wealth according to their abilities. Everyone would share in this wealth according to their needs.

Did You Know?

Karl Marx did not like religion. This prejudice made many religious people dislike Communism.

Communist Governments

The Russian Revolution of 1917 brought the first Communist government into power. Vladimir Lenin set up a political party to put Marx's ideas into practice. This party, later called the Communist Party, organized a new country named the Soviet Union.

After World War II ended in 1945, the Soviet Union forced many countries in eastern Europe to set up Communist governments. The United States and its allies opposed the spread of Communism. A rivalry called the Cold War developed between the two sides.

Communists took control of China in 1949. Communism then spread to other parts of Asia (Vietnam, Cambodia, North Korea), Africa (Ethiopia and Angola), and Central America (Cuba and Nicaragua).

None of these countries ever achieved a true Communist society like Marx had described. Instead of having no government, they all had very strong, strict governments. Plus, their government-run economies did poorly. Between 1989 and 1991 the Communist governments in the Soviet Union and eastern Europe collapsed. China's Communist government ruled into the 21st century. But China also took some steps toward a capitalist system.

► More to explore

Capitalism • China • Cold War
• Economics • Lenin, Vladimir Ilich
• Russian Revolution • Socialism
• Union of Soviet Socialist Republics

Comoros

Three volcanic islands make up the Union of the Comoros, a tropical country off the east coast of Africa. The capital is Moroni, located on the island of Ngazidja.

Geography

Comoros includes the islands of Ngazidja (Grande Comore), Mwali (Mohéli), and Nzwani (Anjouan). The island of Mayotte, to the southeast, is a French territory. The islands lie in the Indian Ocean between Mozambique, a country in southeastern Africa, and Madagascar, a much larger island country. Volcanoes formed the islands, which are all mountainous. The climate is hot, with dry and humid seasons.

Plants and Animals

The islands contain lush tropical rain forests. Coconut palms and mangrove trees grow along the beaches. Among Comoros' animals are rare bats, birds, and lemurs. In the waters live coela-

canths, fish that scientists once thought were extinct.

People

Most Comorans have a mixture of African, Arab, Malay, and Indonesian roots. The majority of people are Muslims. The official languages are Comorian, Arabic, and French. Comorian is similar to Swahili, a language spoken in East Africa. About two thirds of the population lives in rural areas.

Economy

Comoros is a poor country. Agriculture and fishing are the most important parts of the economy. Crops include coconuts, bananas, cassava, rice, cloves, vanilla, and ylang-ylang (blossoms used in perfume). Trade and tourism are also important. Small manufacturers make perfume, cement, soaps, wood products, and clothing.

History

People have lived on the islands since about AD 500. Arab traders later settled there. The Comorans grew rich by selling slaves, sugar, and cloves. France took control of the islands in the 1800s. Comoros gained independence in 1975, but its government was not stable for many years. In 2001 a new constitution gave each island more power to govern its own people.

► More to explore

Madagascar • Moroni



Facts About COMOROS



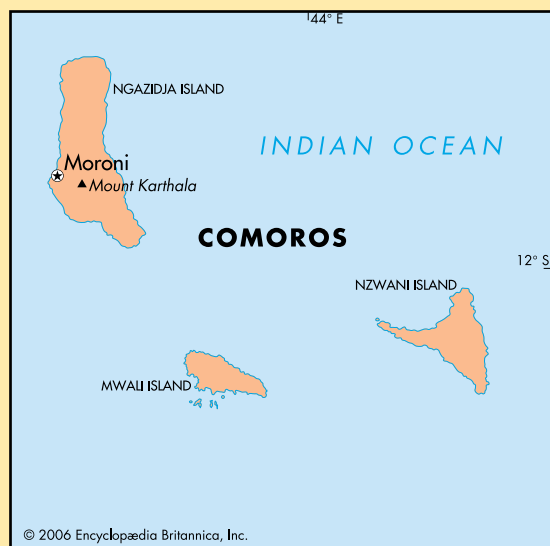
Population
(2008 estimate)
645,000

Area
719 sq mi (1,862 sq km)

Capital
Moroni

Form of government
Federal republic

Major cities
Moroni, Mutsamudu, Domoni, Fomboni

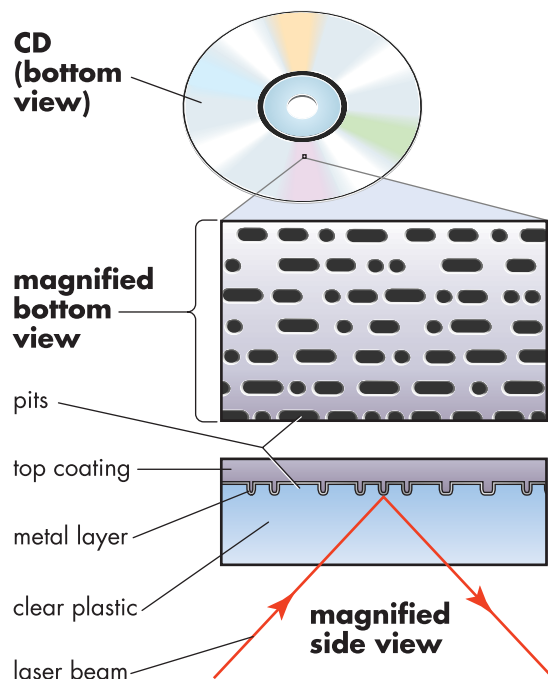


Compact Disc

A compact disc is a round, flat piece of plastic that is used to store and play back information. That information may include music, pictures, or computer programs and games. Compact discs are often called CDs. A digital videodisc, or DVD, looks like a CD but is more advanced. DVDs are often used to store movies.

How a CD Works

A CD is about 0.05 inch (1.2 millimeters) thick and 4.75 inches (12 centimeters) across. Inside the disc is a thin layer of metal. The information is stored on the metallic layer in the form of tiny pits, or holes, and the flat parts between them. The pits are arranged in a spiral, or winding path. The spiral starts in the center of the disc and winds around until it reaches the rim.



A laser beam reads information stored on CDs in a pattern made by tiny pits.

A CD is played by putting it into a CD player or a computer. The player or computer spins the CD. A laser, or strong beam of light, shines on the CD while it spins. The laser beam reflects off the metallic layer of the CD. The shape of the pits in the metal creates a pattern of reflected light. The CD player or computer reads this pattern of light and turns it into a form that a person can see or hear, or both.

History

Compact discs that stored sound were introduced in 1982. By the mid-1980s new discs called CD-ROMs could store pictures and computer programs. DVDs appeared in 1995.

Before CDs and DVDs were invented, music and movies were stored on vinyl records, movie film, or magnetic tape. CDs and DVDs are an improvement over those ways of storing information. The sound quality on a CD or DVD is better than on cassettes or records. CDs and DVDs also last longer and take up less space than film, magnetic tape, and vinyl.

► More to explore

Computer • Laser

Compass

A compass is a tool for finding direction. A simple compass is a magnetic needle mounted on a pivot, or short pin. The needle, which can spin freely, always points north. The pivot is attached to a compass card. The compass card is marked with the



People camping in the woods sometimes carry pocket compasses so they do not get lost.

directions. To use a compass, a person lines up the needle with the marking for north. Then the person can figure out all the other directions.

A compass works because Earth is a huge magnet. A magnet has two main centers of force, called poles—one at each end. Lines of magnetic force connect these poles. Bits of metal near a magnet always arrange themselves along these lines. A compass needle acts like these bits of metal. It points north because it lines up with Earth's lines of magnetic force.

Earth's magnetic poles are not the same as the geographic North and South poles. The geographic poles are located at the very top and bottom of a globe. The magnetic poles are nearby but not at exactly the same places. A compass points to the magnetic North Pole, not the geographic North Pole. Therefore, a

compass user has to make adjustments to find true north.

A special kind of compass called a gyrocompass does point to true north. The gyrocompass uses a device called a gyroscope, which always points in the same direction. Today large ships carry both magnetic compasses and gyrocompasses.

People in China and Europe first learned how to make magnetic compasses during the 1100s. They discovered that when a magnetized bit of iron floated in water, it pointed north. Sailors soon began to use compasses to navigate, or find their way, at sea.

► More to explore

Gyroscope • Magnet and Magnetism
• Navigation

Computer

A computer is a device for working with information. The information can be



Students use a computer in a classroom.



Small computers called laptops can be used for work or for playing games.

numbers, words, pictures, movies, or sounds. Computer information is also called data. Computers can process huge amounts of data very quickly. They also store and display data.

People use computers every day at work, at school, and at home. Computers are used in factories to control how things are made and in offices to keep records. People also use computers for sending e-mail, writing reports, shopping, banking, listening to music, and playing games. The Internet, which is a huge network of linked computers, provides information from all over the world.

Types of Computers

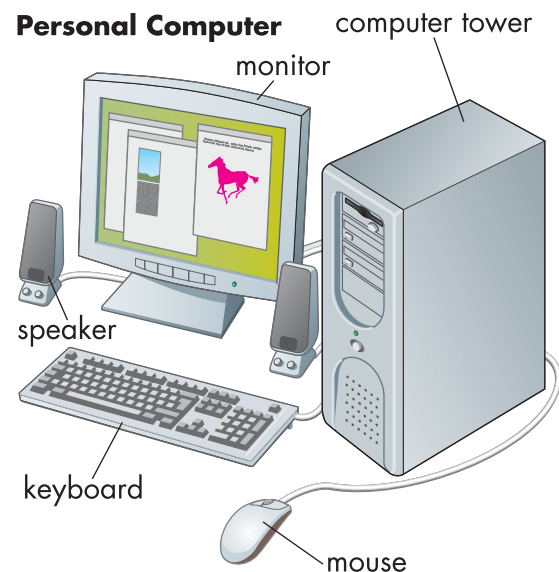
Computers come in many forms. Supercomputers are very powerful and expensive computers that are used for complex work, such as forecasting the weather. Desktop personal computers, or PCs, are used for tasks at the office, at school, and at home. Laptop and notebook computers do the same things as PCs, but they are smaller and easy to carry.

Personal digital assistants, or PDAs, are handheld computers. Some very small computers are used to control machines. They are built into such things as airplanes, robots in factories, cars, and even household appliances.

Computer Hardware and Software

A computer system requires both hardware and software. Hardware is the computer's physical parts. Software is the programs, or instructions, that tell the hardware what to do.

All computers have the same basic hardware. The microprocessor is the computer's "brain." It is also called the CPU, or central processing unit. The microprocessor handles all the information that goes into and comes out of the computer. The memory is hardware that holds programs and data while the microprocessor uses it.



Most personal computers have the same basic parts.

The programs and data are kept permanently on hardware called storage devices. Most computers have a storage device called a hard drive. The hard drive stores data on a metal disk inside the computer. Some storage devices put data on disks that can be easily moved from one computer to another. These disks include CDs and DVDs. They make it easy to share data.

Input and output devices are other types of hardware. Input devices let the user enter data or commands into the computer. Input devices include the keyboard and the mouse. Output devices let the user see or hear the results produced by the computer. Output devices include the monitor (or screen), printer, and speakers.

Communication, or network, devices connect computers to each other. They let people send data from one computer to another and connect to the Internet. Modems are communication devices that can send data through telephone wires or television cables. Some computers use wireless communication devices. They send data through the air using a small antenna.

Computer software is divided into two basic types—the operating system and application software. The operating system controls how the different parts of hardware work together. Application software gives the computer instructions for doing specific tasks, such as word processing or playing games.

How Computers Work

Most computers are electronic devices. This means that they work with electricity. All computer data is carried in tiny flows of electricity called electric currents. The microprocessor contains thousands or millions of tiny electronic parts called transistors. The transistors act as switches. They control how the electric currents flow.

Computers use these electric currents to represent the numbers 0 and 1. Computers use only these two numbers because transistors, like light switches, have only two states—they are either on or off. A transistor that is “on” represents one of the numbers. A transistor that is “off” represents the other. Computers use strings of 0s and 1s to stand for letters, sounds, and all of the other data they handle. For example, a computer stores the word dog as three numbers: 01100100 (d), 01101111 (o), and 01100111 (g).

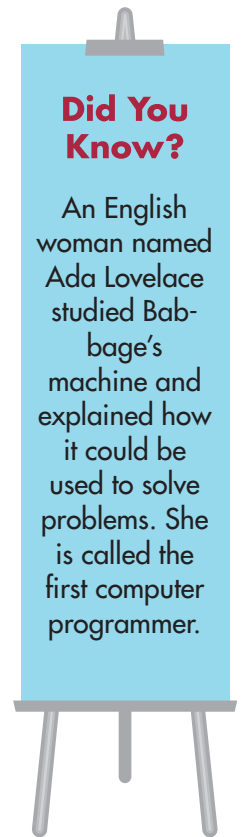
Computers can understand only these patterns of 0s and 1s. All of the instructions that a computer follows have to be in this form. But people find it hard to work with long number patterns. So the people who write computer software, called computer programmers, have their own special languages. These include programming languages called BASIC, Java, and C++. The computer turns programming languages into the number patterns that it can understand.

History

An English inventor named Charles Babbage designed the first computer in

Did You Know?

An English woman named Ada Lovelace studied Babbage's machine and explained how it could be used to solve problems. She is called the first computer programmer.



Did You Know?

The most powerful computers are called supercomputers. The fastest supercomputers of the 21st century can do trillions of calculations per second.

the 1830s. It was mechanical, not electronic, because scientists did not yet know how electricity worked. The design called for more than 50,000 moving parts. The machine was designed to follow instructions that people entered using punched cards. It was so complex that Babbage never got it built. But it is still considered to be the first computer.

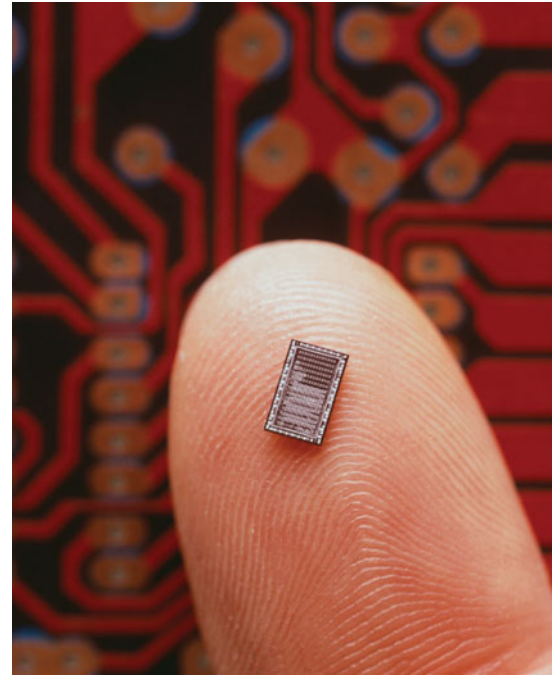
The first electronic computers were invented in the 1940s. In place of mechanical parts, they used electronic switching devices called vacuum tubes. These computers were so big that just one of them filled a whole room. They cost millions of dollars.

Computers improved after the transistor was invented in 1947. The transistor was an electronic switching device that was much smaller and worked better than a vacuum tube. By 1960 transistors had mostly replaced vacuum tubes in computers. The new computers were smaller and more affordable than before.

The first computers with microprocessors appeared in the early 1970s. A microprocessor had many tiny transistors on one small wafer, or chip. It made personal computers possible. As more transistors were included in microprocessors, computers became faster and less expensive.

► More to explore

Electricity • Electronic Games
• Electronics • Internet



Computer chips are tiny but they can work with a large amount of information very quickly.

Conakry



Population
(2004 estimate)
1,851,800

Conakry is the capital of the West African country of Guinea. It is the country's only large city. Part of Conakry is on Tombo Island in the Atlantic Ocean. The rest of the city is on the mainland of Africa. A raised roadway connects the city's two parts.

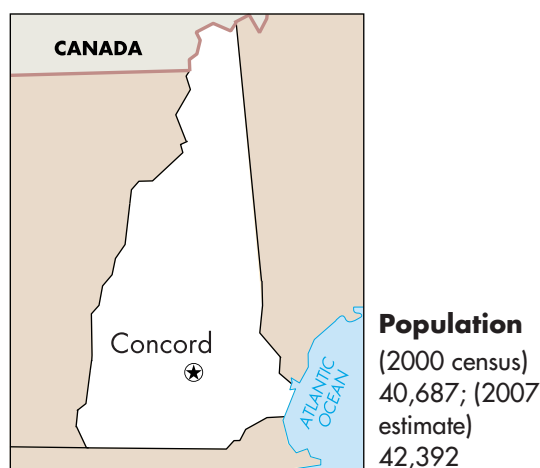
Shipping brings money to Conakry. The city is Guinea's main port. Government jobs and business services

are important to the economy. Conakry is also the country's center of industry.

A people known as the Susu lived in the Conakry area before Europeans arrived. French traders and soldiers took over Tombo Island in the 1880s. Their settlement later became the capital of the colony of French Guinea. In 1958 Guinea became an independent country with Conakry as its capital.

► **More to explore**
Guinea

Concord



Concord is the capital of the U.S. state of New Hampshire. The city lies on the Merrimack River.

Many people in Concord work for the government. Others work in health care, insurance, and other service industries. Factories in the city make electronic equipment and other products.

The site of Concord was settled in 1727. It was named Penacook Plantation and later Rumford. The city was part of



The State House of New Hampshire in Concord was built with local granite.

Massachusetts for several years. It became Concord, New Hampshire, in 1765. Concord became the capital of New Hampshire in 1808.

The State House of New Hampshire was built in Concord with granite from a nearby mine. For many years Concord granite was a popular building material.

► **More to explore**
New Hampshire

Concrete

Concrete is the world's most widely used building material. Concrete is an artificial, or man-made, stone. It is strong and long lasting. It can be made into almost any shape. Concrete is used to make driveways, patios, roads, bridges, and even entire buildings.

How Concrete Is Made

One of the main ingredients of concrete is a fine powder called cement. Concrete



A construction worker moves a slab of concrete. The metal bars in the concrete make it especially strong.

is made by mixing cement with sand, gravel, and water. The water and cement form a thick paste that holds the sand and gravel together. The water also causes a chemical reaction that makes the mixture dry and harden. Before concrete dries it can be poured into forms to make many different shapes, including blocks, bricks, flat slabs, and arches. After the concrete dries, it lasts a very long time.

Advantages of Concrete

Concrete does not burn and it stays strong during a fire. Materials can also be added to make the concrete stand up to heat, water, or chemicals. It can be made light or heavy in weight. Some types of concrete will even harden underwater.

Concrete with metal bars running through it is called reinforced concrete. It is even stronger than regular concrete and can support heavy loads. Reinforced concrete is used to make roads, bridges, and very tall buildings.

History

Concrete has been around for a long time. Thousands of years ago the ancient Babylonians used clay to hold sand and gravel together. Ancient Romans used ash from a volcano to make the concrete. The ash, when mixed with water, acted like glue, just like modern cement does. The Romans used concrete to build their domes, aqueducts, and bridges. In the 1800s cement was invented and became the main ingredient in concrete.

► More to explore

Cement

Condensation

► see Evaporation and Condensation.

Confederate States of America

The Confederate States of America was formed after Abraham Lincoln was elected president of the United States in November 1860. Lincoln was against slavery. For many people in the Southern states slavery was a part of their way of life. They were afraid that the new government would end slavery and make them give up that way of life. Therefore a group of these states withdrew from the United States and formed their own government. To defend this government they fought the American Civil War from 1861 to 1865.

Member States

The first states to withdraw from the Union were Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina. Representatives from these states organized the Confederate States, or Confederacy, on February 4, 1861. Texas joined a month later. After the first shots of the war were fired, Arkansas, North Carolina, Tennessee, and Virginia also joined. Part of Virginia later decided to split off and form the new state of West Virginia. That state joined the United States in 1863. Other slaveholding states stayed in the Union.

Organization

Jefferson Davis of Mississippi was elected president of the Confederacy,

and Richmond, Virginia, was made the permanent capital. The government ordered a flag to be created and issued postage stamps and money. The Confederate States had a constitution similar to the U.S. constitution. The government was also organized into branches and departments much like those of the United States.

The Civil War

After withdrawing from the Union, the Confederate States took possession of the forts and other public property of the United States lying within their borders. U.S. troops, however, continued to occupy Fort Sumter, located in the harbor off Charleston, South Carolina. On April 12, 1861, the Confederacy opened



A map shows how the issue of slavery divided the United States.

fire on the fort. On April 14 the Union troops surrendered. The next day President Lincoln called for troops to be used against the Confederate States. This was the beginning of the Civil War.

End of the Confederacy

The Confederacy had some advantages in the Civil War. It was defending its own territory, and it had brilliant generals. However, the Confederacy had only about 5.5 million citizens (and 3.5 million slaves). There were 22 million Northerners. The Confederacy also had few factories to produce the goods it needed to survive. After four years of fighting, Confederate forces surrendered on April 9, 1865.

► More to explore

American Civil War • Davis, Jefferson

Confucius

For more than 2,000 years the people of China have been guided by the principles of the teacher and philosopher Confucius. His teachings, known as Confucianism, are based on kindness, love, and respect. Confucianism serves as a way of life, a source of values, and a social code for its followers.

Confucius was born in 551 BC in Qufu, in what is now China's Shantung Province. His exact birthday is not known, though many people in eastern Asia celebrate it on September 28. Confucius is not his original name. His family name was Kong. Confucius is a European version of the Chinese name Kong-fuzi, meaning "Master Kong."



The Chinese teacher and philosopher Confucius is pictured in a painting from the 1700s.

Confucius was a good student in his youth. He studied many subjects, including ceremonial practices, music, archery, driving a chariot, calligraphy, and arithmetic. He also had a good understanding of history and poetry.

While in his 30s Confucius began teaching. His goal was to improve society. He believed that students should work on bettering their lives in addition to gaining knowledge.

Confucius was also concerned with politics. He wanted an influential position in the government so that he would be able to reform society. He held government posts while in his 40s and 50s, but he never received a position of great influence. Confucius died in 479 BC.

► More to explore

China

Congo, Democratic Republic of the



Located along the equator in Central Africa, the Democratic Republic of the Congo is the third largest country on the continent. Its capital and largest city is Kinshasa.

Geography

The Democratic Republic of the Congo shares borders with the Central African Republic, Sudan, Uganda, Rwanda, Burundi, Tanzania, Zambia, Angola, and the Republic of the Congo. The western tip of the country touches the Atlantic Ocean.

The Congo River flows through the country and along its western border. High plateaus border the plains around the river. Three chains of mountains run through the east. Margherita Peak, at 16,795 feet (5,119 meters), is the country's highest point. Most of the country is hot and humid.

Plants and Animals

Rain forests of mahogany, ebony, and other trees grow in the Congo river basin. Mangrove trees grow in swamps near the coast. Grasslands cover the eastern plateaus.

The country's many wild animals include chimpanzees, monkeys, elephants, lions, cheetahs, hyenas, buffalo, antelope, rhinoceroses, and giraffes. Gorillas live in the eastern mountains.

Hippopotamuses and crocodiles inhabit rivers and lakes.

People

The people of the Democratic Republic of the Congo belong to many different ethnic groups. The major groups are the Luba, the Kongo, and the Mongo. French and English are the official languages, but many people speak Lingala or one of 200 other languages. Most of the people practice Christianity. The rest follow traditional African beliefs or other religions. More than two thirds of the people live in small towns and villages.

Economy

Most of the people are farmers. Main crops include cassava, sugarcane, plantains, corn, oil palm, peanuts, and rice.





Elephants wade across a stream in the Democratic Republic of the Congo.

Facts About DEMOCRATIC REPUBLIC OF THE CONGO



Population
(2008 estimate)
66,515,000

Area
905,354 sq mi
(2,344,858 sq
km)

Capital
Kinshasa

**Form of
government**
Transitional
regime

Major cities
Kinshasa, Lubum-
bashi, Mbuji-
Mayi, Kolwezi,
Kisangani

The country also produces coffee, cotton, and rubber.

The next most important part of the economy is trade, which depends on the country's rich natural resources. The Democratic Republic of the Congo is a leading producer of diamonds. It also has deposits of petroleum, coal, copper, cobalt, zinc, and gold.

History

Before Europeans arrived in the late 1800s, several kingdoms ruled the region that is now the Democratic Republic of the Congo. They included the Kingdom of Kongo, the Luba Empire, and the Lunda Empire.

King Leopold II of Belgium claimed the region, which he called the Congo Free State, in 1885. The king forced the people to work in mines and on rubber

plantations. In 1908 the Belgian Parliament took over the land, which it renamed the Belgian Congo.

In June 1960 the colony gained independence as the Republic of the Congo. From the beginning, the president and the prime minister fought for power. In September 1960 the army's chief of staff, Joseph Mobutu, took control of the country. In 1971 Mobutu renamed the country the Republic of Zaire.

Mobutu ruled as a dictator who crushed all opposition. By the 1990s, political groups in Zaire demanded a democracy. Rebels forced Mobutu out of the country in 1997. Laurent Kabila took power and changed Zaire's name to the Democratic Republic of the Congo. However, rebels continued to fight the government, and Kabila was assassinated in 2001. His son and successor, Joseph Kabila, worked to end the civil war that had killed millions.



The Enya people fish in the rapids of the Congo River near Kisangani, Democratic Republic of the Congo.

► More to explore

Africa • Kinshasa • Rain Forest

Congo, Republic of the



Antelope, jackals, hyenas, and cheetahs roam the savannas. Rhinoceroses and giraffes live on the plateaus.

People

About half of Congo's people are Bakongo, or Kongo, the ethnic group that gave Congo its name. Other major groups include the Sanga, the Teke, and the Mboshi. French is the official language, but most of the people speak African languages. Most people are Christians. About two thirds of the people live in cities.

Economy

The economy of Congo depends on its petroleum (oil) industry. Congo also produces natural gas, wood, and gold. Most people, however, are farmers. Crops include cassava, sugarcane, oil palm, bananas, and mangoes.

History

Before Portuguese explorers arrived in 1483, the Kingdom of Kongo ruled part of what is now Congo. In 1880 France took control of the region.

Congo gained independence in 1960. In 1992 Congo became a democracy, but fighting soon erupted between government forces and rebel groups. After the civil war, voters approved a new constitution in 2002.

► **More to explore**
Brazzaville

The Republic of the Congo lies on both sides of the equator in west-central Africa. Its capital is Brazzaville.

Geography

Congo shares borders with Gabon, Cameroon, the Central African Republic, the Democratic Republic of the Congo, and Angola. It has a short coastline on the Atlantic Ocean. The north contains thick rain forests and swamps. Savannas, or grasslands, cover the center. Mountains and plateaus rise in the southwest.

Plants and Animals

African oaks, red cedars, walnuts, and other trees fill the rain forests. Coconut palms and mangrove forests grow near the coast and the swamps. Grasses and widely spaced trees cover the savannas.

The forests contain monkeys, chimpanzees, gorillas, elephants, and wild boars.

Facts About REPUBLIC OF THE CONGO



Population
(2008 estimate)
3,847,000

Area
132,047 sq mi
(342,000 sq km)

Capital
Brazzaville

**Form of
government**
Republic

Major cities
Brazzaville,
Pointe-Noire,
Dolisie, Nkayi,
Mossendjo

Congress of the United States

► see United States Government.

Conifer

Conifers are a group of trees and shrubs that produce cones. The cones carry their seeds. Most conifers are evergreens, or trees that keep their leaves year-round. Their thin leaves are usually called needles. There are more than 550 types of conifer. Some of the most well-known are cedars, cypresses, firs, junipers, larches, pines, redwoods, and yews. The tallest, heaviest, and oldest living things on Earth are all conifers.

Where Conifers Grow

Conifers grow all over the world. Forests of conifers grow in many cool regions, including the northern parts of Europe, Asia, and North America. Some types of conifer grow in tropical rain forests in

Asia. Others grow in warm parts of Australia and Africa.

Physical Features

Conifers have woody trunks and stems. They may be low shrubs or very tall trees. Their leaves often look like needles, but some types have leaves shaped like scales, blades, or wedges. A waxy coating keeps the leaves from losing water. Most conifers have shallow roots that spread out wide.

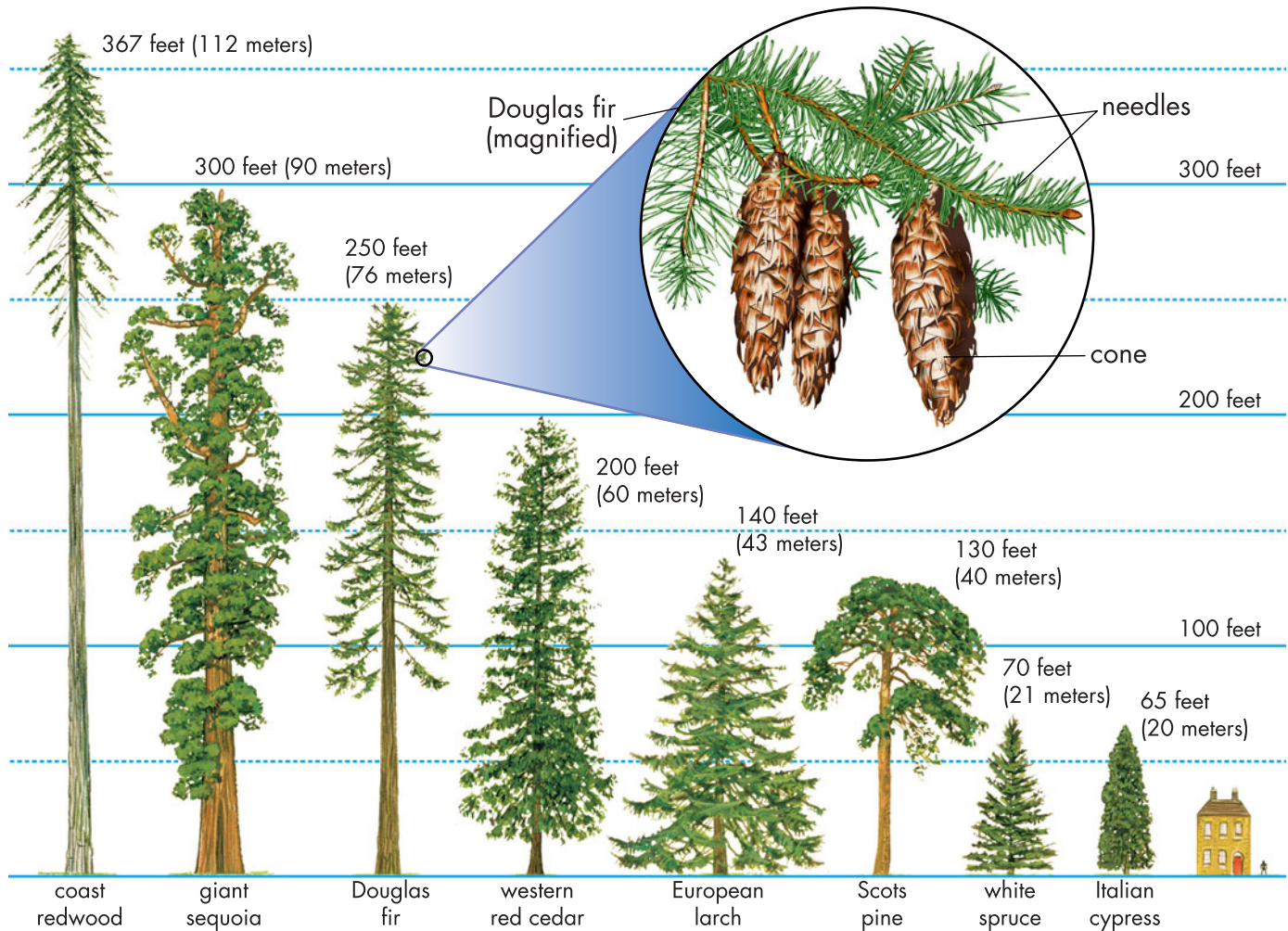
Conifers grow cones instead of flowers or fruits. Most conifers' cones are oval in shape. Scales cover the outside of the cone. Some types of conifer grow male and female cones on the same tree. Others have male or female cones on separate trees. The male cones, which are smaller than female cones, produce pollen. Wind carries this pollen to the female cones. Then the female cones develop seeds under the scales. The scales slowly open until the seeds fall out. Wind or animals carry the seeds to spots where new conifers can grow.

Amazing Conifers

The redwood trees in California are the tallest conifers and the tallest trees in the world. Some redwoods are taller than 360 feet (110 meters). The giant sequoias, also in California, are the heaviest conifers. They sometimes weigh more than 4 million pounds (2 million kilograms). The pygmy pines of New Zealand are the smallest of all conifers. They grow to only 2 inches (5 centimeters) tall.



A large forest of conifers stands in the northern European country of Finland.



Conifers grow their seeds inside cones. They usually have needle-shaped leaves. Redwoods are the tallest conifers and the tallest trees on Earth.

Bristlecone pines are the oldest conifers, as well as the oldest living things on Earth. It is not unusual for them to live for 3,000 to 4,000 years. They grow in dry, mountainous regions in California and Nevada.

Uses

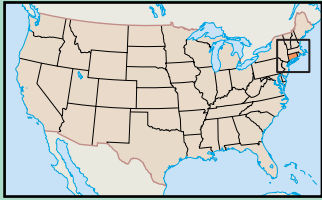
People have used the wood of conifers for thousands of years. Ancient peoples built great sailing ships out of cedars from the Middle East. More than 500 years ago, warriors in Europe made long bows from the bendable wood of yews.

Today people use the wood of pines to make houses and furniture.

People today also plant conifers in gardens, parks, and yards. They grow them indoors as decorative plants. People in North America and western Europe use pines, firs, spruces, and other conifers as Christmas trees. In addition, conifers are used to make such products as paper and turpentine.

► More to explore

Cedar • Cypress • Fir • Juniper • Larch
• Pine • Redwood • Tree • Yew



Connecticut

The state of Connecticut was named for the Connecticut River. Algonquian Indians called the river *Quinnehtukqut*, meaning “land on the long tidal river.” Connecticut is nicknamed the Constitution State because its early settlers wrote a set of laws to govern themselves that later provided ideas for the U.S. Constitution. Those laws, known as the Fundamental Orders of Connecticut, were created in 1638 and covered such issues as elections, powers of officials, and taxation. The capital of Connecticut is Hartford.

Geography

Connecticut is the southernmost New England state. It is bordered by Massachusetts on the north, Rhode Island on the east, New York on the west, and the Long Island Sound on the south.

Connecticut has highlands in the west and east with a lowland in the middle. The northern part of the western high-

lands is called the Litchfield Hills. They include Mount Frissell, which is the state’s highest point at 2,380 feet (725 meters). The central lowland includes the fertile Connecticut River valley. The eastern highlands are low, wooded hills with many rivers.

People

At the time of the first U.S. census, in 1790, almost all of Connecticut’s people were English. In the 1800s Irish, French Canadian, Italian, Polish, and other European immigrants settled in the state. Today more than four fifths of Connecticut’s residents are of European heritage. African Americans and Hispanics each make up about 9 percent of the population. The state’s Asian American and Native American groups are small.

Connecticut has a large population for its size. As a result, it is one of the country’s most crowded states. Most of its people live in cities or towns. Bridgeport, on the coast, is the largest city. Other large cities are Hartford, New Haven, and Stamford.

Economy

Real estate, finance, and the insurance industry are major parts of Connecticut’s economy. Hartford is known as the Insurance Capital of the World because of the many insurance companies with offices there. Manufacturing businesses in Connecticut produce jet aircraft engines, computer equipment, chemicals, machinery, and other goods. Hart-





The writer Mark Twain lived in Hartford, Connecticut, for more than 15 years. The house that he lived and worked in is now open to the public.

ford, Bridgeport, Danbury, and New Haven are the state's leading manufacturing centers. New Haven is also the site of Yale University, one of the leading educational institutions in the United States.

History

The first residents of the Connecticut region were Algonquian Indians. Euro-

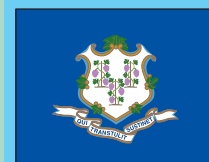
peans arrived from nearby colonies in the 1630s. In 1633 Dutch colonists built a fort and trading post where Hartford now stands. English colonists from Massachusetts established posts at what are now Wethersfield and Windsor. Later the English took over the Hartford site. In 1662 the English king made Connecticut an independent colony. In 1788 Connecticut entered the Union as one of the original 13 states.

Connecticut was a farming region until the early 1800s, when textile factories were established. By 1850 more people worked in manufacturing than in agriculture. In the 1900s Connecticut was called an "arsenal of democracy" because it produced many firearms used in World Wars I and II and the Korean and Vietnam wars. Manufacturing later declined in value, but high-technology industries boosted the economy.

► **More to explore**
Hartford

Facts About CONNECTICUT

Flag



Population

(2000 census)
3,405,565—
rank, 29th state;
(2008 estimate)
3,501,252—
rank, 29th state

Capital

Hartford

Area

5,543 sq mi
(14,357 sq km)—
rank, 48th state

Statehood

January 9, 1788

Motto

*Qui Transtulit
Sustinet* (He Who
Transplanted Still
Sustains)

State bird

American robin



State flower

Mountain laurel



The museum called Mystic Seaport focuses on the time in Connecticut's history when wooden sailing ships were important to the area's economy.

Conquistador

The Spanish word for conqueror is conquistador. Many Spanish soldiers and explorers traveled to the Americas after Christopher Columbus made the first trip in 1492. These conquistadors sailed to the Americas to conquer the native peoples and to spread Christianity. They were also looking for gold and other treasure.

Because of the conquistadors, Spanish culture spread widely throughout South America, Central America, and the southern regions of North America. The Spanish influence is strong in these areas even today.

Many of the conquistadors' actions were cruel. They stole the riches that they found in the new lands. They brutally murdered thousands of native people. They also brought diseases such as smallpox that killed many more thousands.

One of the most famous conquistadors was Hernán Cortés. He destroyed the Aztec Empire in what is now southern and central Mexico. Cortés arrived in Mexico in 1519. He and his men defeated the Aztec in 1521.

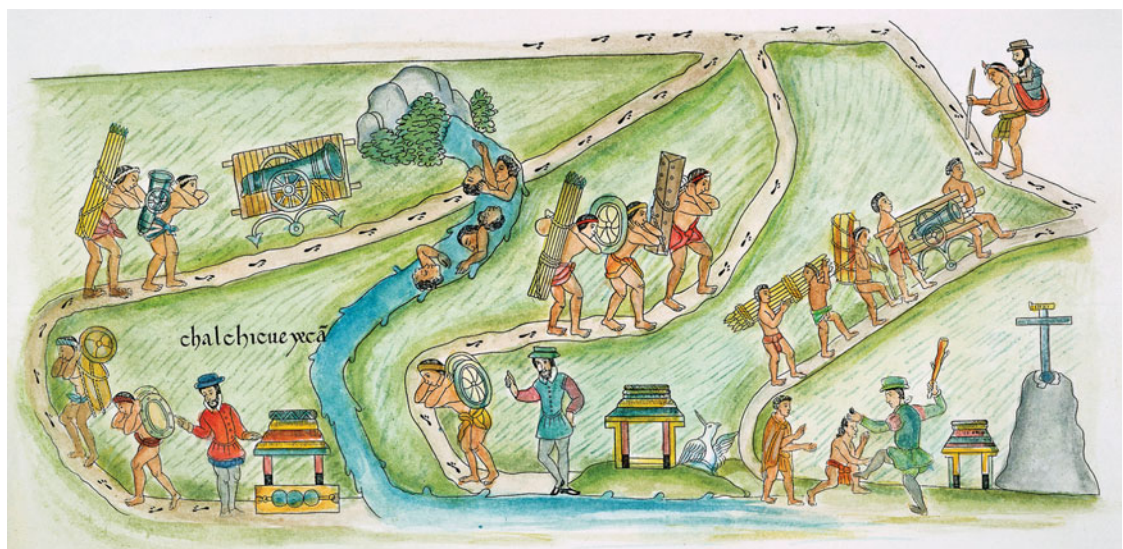
Another Spanish conquistador, Francisco Pizarro, conquered the Inca Empire in what is now Peru. Pizarro came to Peru in 1531. He killed the leader of the Inca and captured their capital in 1533.

► More to explore

Aztec • Columbus, Christopher
• Cortés, Hernán • Inca

Conservation

Conservation is the protection of things found in nature. It requires the sensible use of all Earth's natural resources: water, soil, minerals, wildlife, and forests. People who care about conservation try to preserve natural resources so they



An illustration shows Spanish conquistadors supervising Native Americans, who are carrying supplies for them.

will still be around in the future. They also try to keep the environment clean and healthy.

Types of Resources

Some resources are renewable, which means they can be replaced. Living things, such as plants and animals, are examples of renewable resources because they can reproduce themselves. But renewable resources can still be damaged or destroyed. For example, people might catch too many of one type of fish. If not enough fish are left to reproduce, that type of fish might die out. Conservation helps people manage renewable resources so they are kept in good supply.

Other resources are nonrenewable, which means they cannot be replaced. Fossil fuels, such as coal and petroleum (oil), are examples of nonrenewable resources. Minerals, such as iron ore, also are nonrenewable resources. People can conserve nonrenewable resources by using them carefully. They can also look for other resources that serve the same



Some cities encourage people to carpool, or share car rides. Carpooling is a good way to conserve gasoline.

purpose. For example, people can use less petroleum by using other types of fuel instead.

Conservation Challenges

Conservation can be hard because it can require people to give up some conveniences. For example, cars make travel easy, but they also produce a lot of air pollution. To have cleaner air, people can choose to drive less and walk more. Such changes can be hard when people have gotten used to a certain way of living.

Money is another reason why conservation can be a challenge. For example, a timber company might be able to protect forest animals by limiting the number of trees it cuts. But the company might not be willing to do this because it will make less money. Also, factories might not want to spend the money to clean up the messes they make.

Conservation Solutions

Everyone can contribute to conservation in one way or another.



Workers take care of young tropical trees in Brazil. The trees were planted to replace trees that were cut down.

People can recycle paper, plastic, glass, and other materials. Recycling saves resources by reusing materials that would otherwise be thrown away. Industries can limit the amount of pollution they create. Governments can make laws that help to keep the air and water clean. Governments have also set aside land as national parks. These parks protect land and animals in their natural state.

► **More to explore**

Environment • Fossil Fuel • National Parks • Natural Resources • Pollution • Recycling

Constellation

A constellation is a group of stars. The groups are identified according to patterns that people have seen in the stars. For example, the stars of the constellation Leo seem to trace the outline of a lion. The name Leo means “lion” in the Latin language. The constellation Draco, whose name is Latin for “dragon,” is said to look like a dragon. However, these are not scientific groupings. They are simply ways that people have imagined the stars.

Since ancient times people have tried to explain the night sky. Over thousands of years different cultures have seen different patterns in the stars. They have named many different constellations after familiar animals, everyday objects, and characters and beasts from stories.

Today constellations provide a connection between modern humans



The constellation Orion is associated with a character in Greek mythology who was a hunter. An illustration shows how the stars of the constellation might be seen as the image of a hunter.

and ancient stories. They are also interesting to spot in the night sky. Astronomers, or scientists who study stars, have named 88 constellations. They use the constellations to help describe the location of specific stars. Among them are the 12 well-known constellations that lie in a band of space called the zodiac. These are Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Capricornus, Aquarius, and Pisces.

A person looking at the sky from the same point every night will see different constellations at different times of year. This happens because Earth moves around the sun, while the stars do not. Earth completes one trip around the sun

Did You Know?

The sky above the Southern Hemisphere (half of the world) and the sky above the Northern Hemisphere have different sets of constellations.

each year, so different stars are visible from Earth in the course of a year.

► More to explore

Astronomy • Star

Constitution

A constitution is a set of rules that guides how a country, state, or other political organization works. The constitution may tell what the branches of the government are, what powers they have, and how they work. It may also state the rights of citizens. The government's other laws are not allowed to disagree with its constitution. The constitution may be amended, or changed, but this is generally more difficult to do than passing an ordinary law.

Development of Constitutions

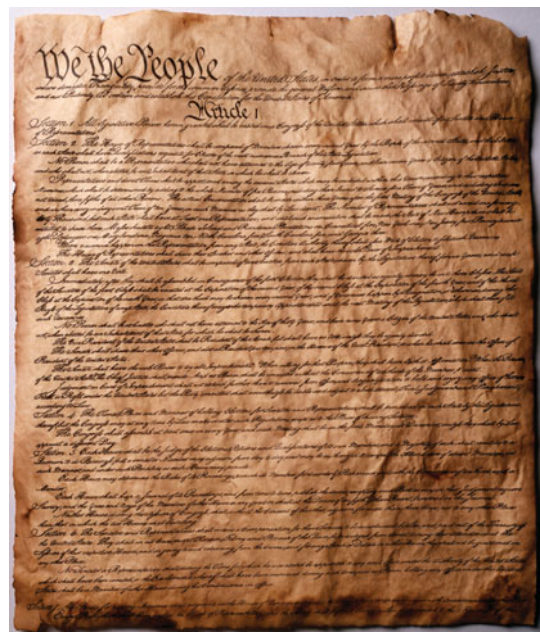
The first people to think about constitutions were the ancient Greeks. They established a form of democracy, in which some of the people had a say in how the government was run. For hundreds of years after this, however, most people were ruled by kings or queens. The people had no rights, and they had no say in how they were governed. Eventually that began to change. In 1215 the landowners in England were upset with their cruel and greedy ruler, King John. They banded together and forced the king to sign a document that guaranteed them certain rights. The document was called the Magna Carta. The Magna Carta served as a model for many future constitutions.

In the 1600s and 1700s thinkers like John Locke in England and Jean-Jacques Rousseau in France wrote about an idea called the social contract. This idea states that people give up their freedom to do anything they want in return for the protection of a stable government. These thinkers influenced the writing of the U.S. Constitution in 1787.

Modern Constitutions

The U.S. Constitution took effect in 1789. It is now the oldest written constitution. It has set a pattern for many other countries. Today almost all countries have written constitutions. Many have had several in their history.

One country without a written constitution is Saudi Arabia. It uses the Koran and other Islamic teachings as its highest law. The most famous example of a country without a written constitution



The original signed copy of the U.S. Constitution is one of the treasures of the National Archives in Washington, D.C.

is the United Kingdom. The British constitution is a group of laws that have built up throughout history. Its elements include the Magna Carta, the English Bill of Rights of 1689, laws passed by Parliament, court decisions, and other sources.

Not all constitutions come from the people of the country. For example, the United States set up the Japanese constitution of 1947 after it defeated Japan in World War II. And even the finest constitution does not guarantee that the government will follow it. Dictators, or rulers who take unlimited power, often ignore their country's constitution.

► **More to explore**

Amendment • Government • Magna Carta • United States Constitution

In order from largest to smallest, they are Asia, Africa, North America, South America, Antarctica, Europe, and Australia. Sometimes people think of Europe and Asia as a single continent called Eurasia.

The continents have different kinds of weather, landscapes, and populations. For instance, Antarctica is icy and has very little plant and animal life. Africa, though, tends to be very warm and has a great variety of plants and animals.

Most of the continents are also divided into political units called countries. Parts of Antarctica are claimed by several countries, but there are no permanent settlements on the continent. Australia is the only continent that is occupied by a single country.

Continent

On a globe, continents are the easiest things to spot. A continent is a large solid area of land. Earth has seven conti-

In 1912 a German scientist named Alfred Wegener came up with the idea that the continents were once all joined together. He called this large body of land Pangaea. He suggested that more



than 200 million years ago Pangaea split apart to form the continents. The continents then drifted apart to their current locations.

Scientists since then have found evidence that this idea is correct. They now believe that the continents sit on a number of large plates. The plates float on a layer of melted rock. As the plates slide over the melted rock, the continents also move. This idea is called plate tectonics.

► More to explore

Africa • Antarctica • Asia • Australia
• Europe • Map and Globe • North America • Plate Tectonics • South America

Continental Congress

The Continental Congress was the first government of the United States. When the congress adopted the Declaration of Independence on July 4, 1776, it brought the United States into existence. It then served as the country's government until the U.S. Constitution went into effect in 1789.

First Continental Congress

In the early 1770s citizens of the 13 British colonies in North America were starting to rebel against Great Britain. A network of patriots, known as the Committees of Correspondence, called together the First Continental Congress to plan future action.



The First Continental Congress met in Philadelphia, Pennsylvania, on September 5, 1774.

The First Continental Congress met in secret in Philadelphia, Pennsylvania, on September 5, 1774. All colonies except Georgia sent delegates, or representatives. George Washington, Patrick Henry, John Adams, and Samuel Adams were among them. Each colony had one vote.

The delegates decided not to call for independence from Britain. Instead they demanded such rights as life, liberty, property, public assembly, and trial by jury. They protested having to pay British taxes without being represented in Parliament (the part of the British government that made laws). The congress also called for the colonies to boycott, or refuse to buy, British goods.

Second Continental Congress

The American Revolution had already begun when the Second Continental Congress opened in Philadelphia on May 10, 1775. Delegates from all 13

colonies attended the congress. New delegates included Benjamin Franklin and Thomas Jefferson. Among those serving as president were John Hancock and John Jay.

The congress took control of the colonies' new Continental Army. It put Washington in command of the army. The congress also issued and borrowed money and set up a postal service and a navy.

At first the congress still said that the colonists were fighting for their rights as British citizens. On July 2, 1776, however, the congress stated that the colonies should be independent states. The congress declared independence from Britain two days later.

The congress prepared the Articles of Confederation, which served as the first constitution of the new United States. The articles went into effect in 1781. They gave Congress official powers. After that, the Continental Congress became known as the Confederation Congress.

The Confederation Congress had little real control over the states. In 1789 the new U.S. Constitution set up the U.S. Congress. The U.S. Congress replaced the Confederation Congress.

► More to explore

American Revolution • Articles of Confederation • Declaration of Independence • United States • United States Constitution

Continental Drift

► see Plate Tectonics.

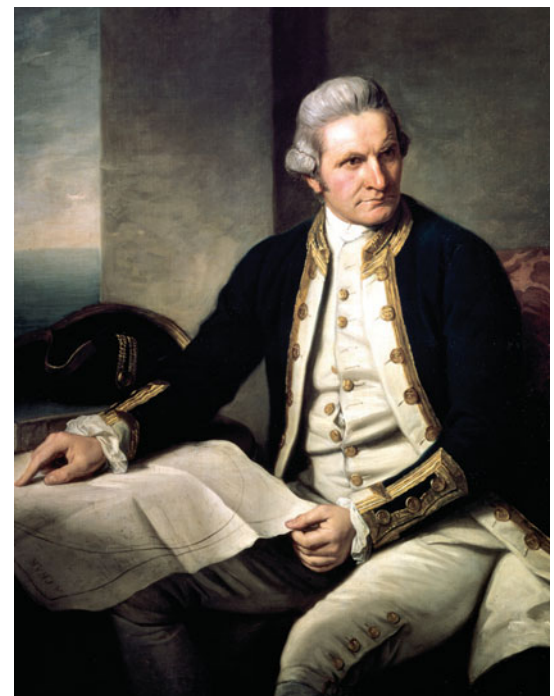
Cook, James

A British explorer and navigator, Captain James Cook led three expeditions to the Pacific Ocean. His voyages took him south to the Antarctic Circle and north to the Bering Strait.

Early Life

James Cook was born on October 27, 1728, in Marton, Yorkshire, England. At age 18 he became a sailor on the North Sea. While ashore he studied mathematics.

In 1755 Cook joined the British Royal Navy. He was promoted quickly and



James Cook

Did You Know?

The Second Continental Congress did not have a permanent home. Its final seat was New York City.

took command of a ship at age 29. He took part in several battles in what is now Canada during the French and Indian War. After the war he charted the coast of Newfoundland. In 1766 he wrote a paper about an eclipse of the sun that won him fame as a scientific observer.

Three Voyages of Discovery

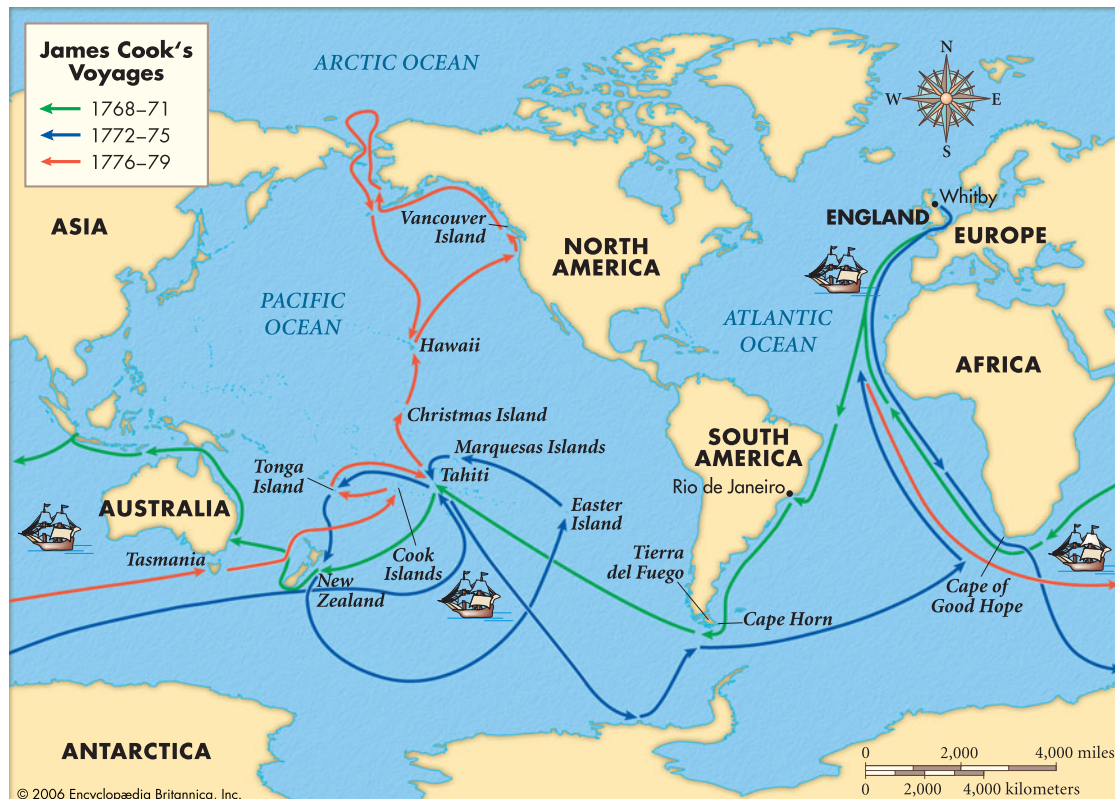
In 1768 the Royal Society of London, an organization of scientists, asked Cook to lead the first scientific expedition to the Pacific Ocean. Cook's expedition charted New Zealand. It also reached the southeastern coast of Australia in 1770. Cook named the continent New South Wales and claimed it for Great Britain. He returned to England the following year. In honor of his achievements, Cook was promoted to the rank of commander.

Between 1772 and 1775, Cook went around the world from west to east, seeking to discover another southern continent. Cook did not reach Antarctica, but he did become the first European to cross the Antarctic Circle. He also discovered and mapped many island groups.

In 1776 Cook set out in search of a Northwest Passage from the Pacific to the Atlantic across the top of North America. He did not succeed, but he did become the first European to visit the Hawaiian Islands. Revisiting the islands on his way back from the Arctic, Cook was killed by Hawaiians. He died on February 14, 1779.

► More to explore

Eclipse • Hawaii • Northwest Passage
• Pacific Ocean



Coolidge, Calvin

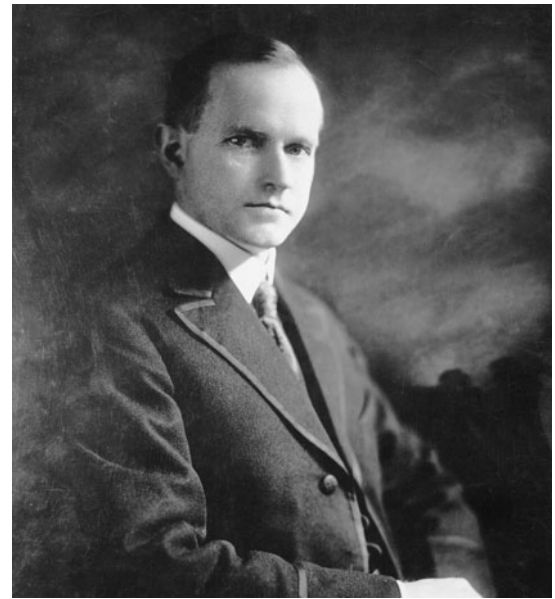
The 30th president of the United States, Calvin Coolidge took office after the death of President Warren G. Harding in 1923. A popular politician, he served during a period of economic growth.

Early Life

John Calvin Coolidge was born on July 4, 1872, in Plymouth, Vermont. He was the only son of a storekeeper, John Calvin Coolidge, Sr., and Victoria Moor Coolidge. Coolidge graduated from Amherst College in Massachusetts in 1895. Two years later he became a lawyer. In 1905 he married Grace Anna Goodhue, a teacher. They had two sons.

Political Career

A Republican, Coolidge entered politics as a city councilman in Northampton, Massachusetts, in 1898. In 1909 he was elected mayor of Northampton. He



Calvin Coolidge was the 30th president of the United States.

served as a Massachusetts state senator from 1911 to 1915 and as lieutenant governor from 1915 to 1918.

Coolidge was elected governor of Massachusetts in 1918. During a 1919 strike (refusal to work) by the Boston police, riots broke out. Coolidge sent the state guard to restore order. He became



TIMELINE

Coolidge is born in Plymouth, Vermont.

July 4, 1872

Coolidge becomes president after Harding dies.

1923

The Kellogg-Briand Pact is signed.

1928

Coolidge dies in Northampton, Massachusetts.

January 5, 1933

Coolidge is elected governor of Massachusetts.

Coolidge is elected to a full term.

Coolidge retires from office.

1918

1924

1929

famous for saying that police officers did not have the right to strike.

In 1920 Coolidge became Harding's vice presidential running mate. They won the election with 60 percent of the popular vote.

Presidency

When Harding died suddenly in 1923, Coolidge became president. The public soon learned that Harding had allowed government officials to make illegal business deals. Coolidge quickly punished people involved in the deals. He restored people's faith in the presidency. In 1924 Coolidge easily won the presidential election.

Coolidge encouraged the expansion of industry. He also led Congress to reduce taxes. The economy grew significantly during his term.

Coolidge generally avoided international affairs. One exception was the Kellogg-Briand Pact of 1928, which Coolidge's secretary of state helped to create. In the pact, 62 nations agreed to end war as a way of solving conflicts.

Retirement

Despite his popularity, Coolidge decided not to run for reelection. In 1929 he retired to Northampton, where he wrote his autobiography and magazine and newspaper articles. He died of a heart attack on January 5, 1933.

► More to explore

Harding, Warren G.

Copenhagen



Population
(2008
estimate), urban
area,
1,153,615

Copenhagen is the capital of Denmark, a country of northern Europe. The city is a leading center of culture and education in Europe. It is also the largest city in Denmark. Copenhagen is located on the islands of Zealand and Amager.

In Copenhagen's harbor is a statue that some people say is the symbol of the city. The statue shows the Little Mermaid, a character from a fairy tale by Hans Christian Andersen. Andersen lived in Copenhagen most of his life.

Copenhagen is the center of business in Denmark. Many people in the city work for the government. Others work in banking, education, communications, and computer services. Factories in Copenhagen process foods and make medical equipment and medicines. Shipping and trade through the port also bring money to the city.

Copenhagen began as a small fishing village that grew up around the harbor. The village was settled by the 900s. In 1167 a fortress was built to protect the village. Copenhagen became the capital

Did You Know?

Copenhagen has a world-famous amusement park called Tivoli.



A statue of the Little Mermaid sits in Copenhagen's harbor. The statue is based on a story by Hans Christian Andersen, an author who lived in Copenhagen.

of Denmark in 1445. In the late 1500s the city grew as a center of trade.

Two fires in the 1700s destroyed many buildings in Copenhagen. The British attacked the city in the early 1800s as part of a larger war. However, Copenhagen continued to grow.

► More to explore

Andersen, Hans Christian • Denmark

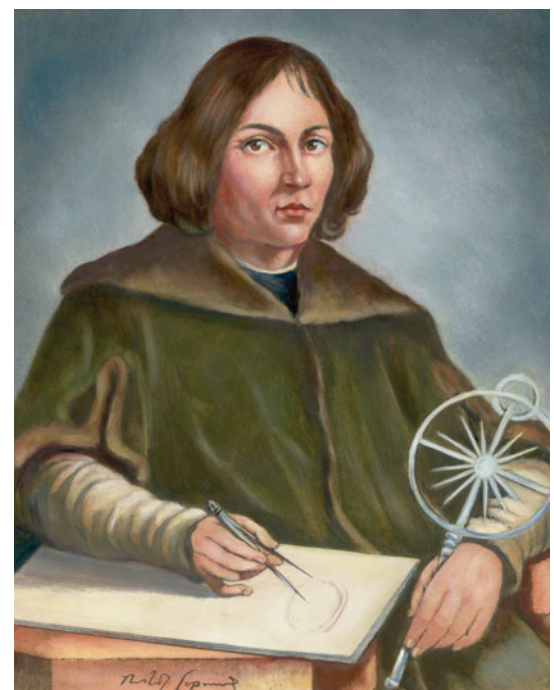
Copernicus, Nicolaus

The Polish astronomer Nicolaus Copernicus was the first person to state that Earth and the other planets travel around the sun. This was an important change in thinking. For hundreds of years before that, most scholars believed

that the sun, stars, and planets revolved around Earth. But they were mistaken.

Copernicus was born in Torun, Poland, on February 19, 1473. He studied in Poland and later in Italy. Copernicus learned several subjects, including astronomy, mathematics, medicine, and church law. Following his studies, he became an officer in the Roman Catholic church. In his spare time he observed the skies.

Copernicus developed many ideas about the solar system, or the sun and the objects that revolve around it. He correctly stated that Earth travels around the sun and also spins about its center. Copernicus published his ideas in a book in 1543. He died that same year, on May 24 in what is now Frombork, Poland. His book did not immediately change the way people viewed the solar



Nicolaus Copernicus

system, but later thinkers realized that his ideas were correct.

► More to explore

Astronomy • Planets • Solar System

Coral

Corals are sea animals that stay in one place throughout their adult lives. Some types produce a skeleton, also called coral, that remains in place after they die. Corals can be very colorful underwater, but most types fade when they die or are removed from the water. Corals belong to the same animal group as sea anemones.

Where Corals Live

Corals live in all the oceans of the world. Some types live alone. Many types live together in groups called colonies. Several different types of corals together can form enormous colonies. These colonies are called coral reefs. The largest coral



Corals are small colorful animals that live in oceans all over the world.

reef in the world is the Great Barrier Reef off the coast of Australia.

Physical Features

The many types of coral include stony, soft, black, thorny, horny, and blue corals. As they grow, corals form different patterns and shapes. They may look like feathers, fingers, branches, or even a brain.

The body of a coral is called a polyp. The polyp is a hollow structure that attaches to a surface. Polyps of large corals may grow to about 10 inches (25 centimeters) across. Other corals have polyps as small as 0.04 inch (1 millimeter) across. At the top of the polyp is a mouth surrounded by tentacles. The tentacles bring small sea animals to the mouth. The tentacles also have stingers that paralyze, or freeze, corals' prey.

Corals have a skeleton that may be outside or inside the body. Stony corals have a hard, outside skeleton made of a mineral called calcium carbonate. As these corals die, new corals build up a colony on top of the dead corals' skeletons.

Life Cycle

To reproduce, corals produce eggs that develop into tiny, swimming creatures called planulae. Planulae eventually settle on a surface and develop into polyps. Corals also reproduce by budding. A bud is a new polyp that develops on the body of an old polyp. Some types of coral may live for hundreds of years.

Did You Know?

Corals are sometimes called the rain forests of the sea. Like rain forests, they are home to many different kinds of living things.

Corals and Humans

People have long used coral skeletons to make jewelry. But this and other human activities have put many corals at risk. Rising ocean temperatures, oil spills, and chemical pollution harm corals. Boats that float over reefs may also damage corals.

► More to explore

Great Barrier Reef • Sea Anemone

Coral Snake

Coral snakes are very poisonous snakes with bright color patterns. Red, black, and yellow or white rings circle a coral snake's body. These markings warn other animals that the snake is dangerous.

Coral snakes belong to the cobra family. There are about 90 species, or kinds, of coral snake. They live in the Americas, from the southern United States to Argentina. Most are found in the tropics. Similar snakes live in Africa and Asia. Many harmless snakes have ring



Coral snakes have brightly colored markings to show other animals that they are poisonous.

patterns like those of coral snakes. This makes other animals think they are dangerous.

Coral snakes have slender bodies with smooth scales. Most measure less than 3 feet (0.9 meter) long. Some South American varieties can grow longer than 4 feet (1.2 meters).

Coral snakes have short, hollow fangs that deliver a powerful venom, or poison. The venom attacks the nervous system and can be deadly to people. Most coral snakes are quick to bite when disturbed.

Coral snakes stay hidden in underground homes called burrows during the day. At night they come out to eat other snakes and small lizards.

► More to explore

Cobra • Nervous System • Snake

Cork

Every year billions of bottles of wine, cooking oil, and other liquids are sealed with corks. Corks are made from the bark of a type of oak tree called the cork oak. The tree grows near the Mediterranean Sea.

The cork oak usually grows to be about 60 feet (18 meters) tall. Its wide-spreading branches give it a shape like an umbrella. Its narrow leaves are dark green and glossy.

The bark of the cork oak grows in two layers. The thick outer layer is the cork.



A worker cuts away the bark from a cork oak in Portugal. The bark will be used to make cork.

Tiny bubbles of air trapped between the cells of the cork make it spongy. After cork is removed from the tree, a new layer forms over a period of years.

How Cork Is Harvested

In the summer, workers cut slabs of the outer layer of bark from the tree. The slabs are stacked to dry and then boiled in water to remove any tree sap. Boiling also softens the cork, which makes it easy to press flat. The flattened cork can be cut into many shapes. It can also be ground into very small pieces and then mixed with glue and shaped to make various products.

Uses

Cork is useful as a stopper for bottles because liquids cannot pass through it. Cork is also a natural insulating material. It can be used to keep a house warm or to absorb sound. Because cork floats,

it is used to make life preservers and buoys. Cork is also soft and springy, making it good for shoe soles. It is also used to make bulletin boards.

Corn

Corn, or maize, is one of the most widely grown food plants in the world. People eat the plant's seeds, which are called kernels or grains. Corn belongs to the grass family. Its scientific name is *Zea mays*.

Corn first grew in the Americas. Early European explorers took corn to Europe. Today farmers grow corn in many areas of the world. The United States, China, Brazil, Mexico, and Argentina are major producers of corn.

The corn plant is tall. It has a stout stem with a tassel at the top. Large, narrow leaves grow out from the stem. Spikes grow from under the bases of the leaves. These spikes are a form of flower. They develop into ears, which contain the seeds that people eat. Leaves called shucks or husks surround each ear.



Rows of golden corn line a Nebraska field.

Did You Know?

A substance called high-fructose corn syrup is used to sweeten soft drinks. It is made from corn.

There are many varieties of corn plants. Native Americans grew corn with yellow, red, blue, pink, or black kernels. Today most corn has yellow kernels. Corn kernels may be soft, hard, starchy, or sweet. The hardest kernels are called popcorn. They explode when heated.

People in Latin America grind up corn kernels to make masa. Masa is a kind of dough used in tortillas, tamales, and other foods. In the United States sweet corn is a popular food. People often eat boiled or roasted corn on the cob. They also use the kernels in corn bread and other dishes. Farmers feed other kinds of corn to their farm animals. The parts of the plant that are not eaten may be made into paper, fuel, and other products.

► More to explore

Grain • Grass • Seed

Coronado, Francisco

In search of gold, Francisco Coronado led the first major European expedition north from Mexico. His travels in the 1540s established Spain's later claims to what is now the southwestern United States.

Francisco Vázquez de Coronado was born in Salamanca, Spain, in about 1510. He arrived in the New World in 1535 with Antonio de Mendoza, the new ruler of New Spain (Mexico). In 1538, after putting down a slave revolt,

Coronado became governor of a Mexican province.

At about that time the Spanish heard tales of towns filled with riches. Mendoza put Coronado in charge of a large expedition to find the towns and to bring back their treasures.

Coronado set out in 1540. In what is now New Mexico he indeed found cities, but they were made of adobe (sun-baked clay), not gold. They were the pueblos (villages) of the Zuni Native Americans. However, some of his men became the first Europeans to see the Grand Canyon.

In spring 1541 Coronado went on to what is now Kansas because a Native American woman had told him of another fabulously wealthy land called Quivira. It again turned out to be only an Indian village, but the Spaniards became the first Europeans to see the Great Plains and the large bison (buffalo) herds that roamed there.



In 1544 Coronado was charged with corruption and cruelty to the Native Americans. He was later removed from his governorship. He died on September 22, 1554.

► More to explore

Zuni

Cortés, Hernán

The Spanish soldier Hernán Cortés conquered the great Aztec Empire in 1521. The conquest began 300 years of Spanish rule over Mexico.

Hernán Cortés (also called Hernando Cortez) was born in 1485 in Medellín, Spain. At age 19 he sailed for the island of Hispaniola in the West Indies. There he farmed and did legal work. In 1511 he helped Diego Velásquez conquer Cuba. Cortés became mayor of Santiago, the capital.

In 1518 Velásquez asked Cortés to start a colony in Mexico. While exploring the coast Cortés learned about the Aztec Empire. He landed at what is now Veracruz in April 1519. He burned his ships so his men could not turn back.

After defeating the Tlaxcaltec people in battle, Cortés made them his allies. The Tlaxcaltec and other tribes resented Aztec demands for sacrifices and treasure. On November 8, 1519, Cortés marched into the Aztec capital of Tenochtitlán (now Mexico City). The Aztec emperor Montezuma II welcomed Cortés because he thought he was a god of Aztec legend. Cortés quickly seized power.

Meanwhile, the jealous Velásquez sent a Spanish force against Cortés. Cortés defeated them, but while he was away the Aztec regrouped. They drove his forces back. Cortés then rejoined the Tlaxcaltec. He captured Tenochtitlán on



A painting shows Hernán Cortés leading a group of Tlaxcaltecs to the Aztec capital of Tenochtitlán.

August 13, 1521, ending the Aztec Empire.

The king of Spain made Cortés a nobleman. Cortés spent the 1530s in Mexico and explored Baja California in 1534–35. In 1540 he went back to Spain. He died there on December 2, 1547.

► More to explore

Aztec • Mexico

Cosmetics

Cosmetics are products that people put on their bodies to make themselves feel more beautiful. There are many types of cosmetics, including face makeup, nail polish, lotions, perfumes, and shampoos. Cosmetics are very popular today, and they were also used in ancient times.



Many people all over the world use cosmetics to make themselves feel more beautiful.

Types of Cosmetics

Many women use cosmetics for the face. Makeup, or foundation, gives the face color and highlights the features. Powder helps make the face look less shiny. Blush makes cheeks look rosy. Lipstick gives the lips color and shine. Eye shadow and eyeliner can make the eyes look bigger or more dramatic. Mascara makes the eyelashes thicker and darker.

Many types of oils and lotions can soften the skin on the hands and body. Shampoos clean the hair, and conditioners help keep the hair soft and healthy. People use hair creams, gels, and sprays to style the hair. Hair tints and dyes come in many different colors. Some are natural vegetable dyes such as henna, which has a reddish tone. Other hair color treatments use chemical bleaches.

History

Ancient Egyptians were the first people known to use cosmetics. Egyptian men and women used perfumed oils to keep their skin from drying out. They also used natural coloring on their eyelids and eyelashes. The Romans later introduced more types of cosmetics.

For much of history rich and powerful people were the main users of cosmetics. In the 20th century cosmetics became cheaper and more widely used. Today millions of people throughout the world use cosmetics every day.

► More to explore

Egypt, Ancient

Costa Rica

The Republic of Costa Rica is known for having the most stable democratic government in Central America. Its name means “rich coast.” The capital and largest city is San José.

Geography

Costa Rica is surrounded by Nicaragua, the Pacific Ocean, Panama, and the Caribbean Sea. Mountains—some with active volcanoes—run through the land. Earthquakes are also a danger. The coastal plains are hot year-round, while the mountains have milder temperatures.

Plants and Animals

Forests of broad-leaved, evergreen trees cover much of Costa Rica. The country has both North and South American types of animals. South American animals include monkeys, anteaters, and sloths. North American ones include deer, wildcats, and coyotes. Tropical birds, snakes, and iguanas are also common.



People

Most Costa Ricans are white. Many others are mestizos (people with mixed European and Native American roots). There are also small groups of Africans, Asians, and Native Americans. Spanish is the official language. Most people are Roman Catholics.

Economy

Manufacturing, trade, tourism, and other services are the main economic activities. Manufacturers make mainly food products and beverages. Exports include electronic parts and bananas.

History

Before Christopher Columbus arrived in 1502, Native Americans lived in what is now Costa Rica. The area was a colony of Spain until 1821, when it joined the Mexican Empire. In 1823 Costa Rica and four other countries declared their independence from Mexico as the United Provinces of Central America. Costa Rica left that union in 1838.

In 1890 Costa Rica held the first free and honest election in Central America. Despite brief revolutions in 1917 and 1948, the country developed peacefully. In the late 20th century Costa Rica helped to settle political fighting in neighboring countries.

► More to explore

Central America • San José



Facts About COSTA RICA



Population
(2008 estimate)
4,389,000

Area
19,730 sq mi
(51,100 sq km)

Capital
San José

Form of government
Republic

Major cities
San José, Limón,
Alajuela, San
Isidro de El Gen-
eral, Cartago,
Liberia



Côte d'Ivoire

The Republic of Côte d'Ivoire lies on the west coast of Africa. Its name, meaning “Ivory Coast,” came from its trade in elephant tusks, or ivory. Yamoussoukro is the official capital, but most government offices are in Abidjan.

Côte d'Ivoire shares borders with Liberia, Guinea, Mali, Burkina Faso, and Ghana. The Atlantic Ocean lies to the south. The land rises from the coast to high savanna, or grassland, in the north. Mountains run through the west. The climate is generally hot and humid.

The tropical rain forest in the south contains teak trees. Its wildlife includes giant forest hogs and bongos (a type of antelope). Antelope, lions, and elephants live in the northern savanna.



Facts About CÔTE D'IVOIRE



Population
(2008 estimate)
19,624,000

Area
123,863 sq mi
(320,803 sq km)

Capital
Yamoussoukro

Form of government
Republic

Major cities
Abidjan, Bouaké,
Daloa,
Yamoussoukro



Growing and selling fruits and vegetables is an important part of Côte d'Ivoire's economy.

Major ethnic groups include the Akan and the Mande. French is the official language. Most people are Muslim or Christian, but many follow traditional African religions or no religion.

Côte d'Ivoire's economy depends on agriculture. Farmers grow yams, cassava, and other crops for food. They grow cocoa and coffee for export. The country also produces petroleum (oil), natural gas, wood, gold, and diamonds.

Important kingdoms existed in the region for centuries before Europeans arrived in the 1400s. The Europeans built a trade in ivory and slaves. In 1893 France made the region a colony. Côte d'Ivoire gained independence in 1960. Years of unrest led to a civil war in the early 21st century.

► More to explore

Abidjan • Yamoussoukro

Cotonou



Population
(2004 estimate)
818,100

Cotonou is the largest and most important city in the West African country of Benin. Although Porto-Novo is Benin's capital, the president and many government officials work in Cotonou.

Cotonou lies at the southern end of Benin on the Gulf of Guinea. It is an important port and the business center of Benin. The main products made in Cotonou are cloth goods, beverages, and palm oil.

Cotonou is also a lively city filled with street sellers and markets. The Artisanal Center offers arts and crafts made by local artists. The Marché Dantokpa is a

large, open-air market with many goods for sale. Cotonou's beaches attract many visitors. The National University of Benin is located in Cotonou as well.

The land around Cotonou was once known as Dahomey. In the 1800s the French slowly took control of Cotonou from the king of Dahomey. The French conquered all of Dahomey by 1894. Dahomey gained independence in 1960. The country finished building a modern port at Cotonou in 1965.

► More to explore

Benin • Porto-Novo

Cotton

Cotton is a fiber, or hairlike material, that people use to make cloth and other goods. Cotton grows on shrublike plants. Cotton plants belong to the mallow family, which also includes hollyhock and okra.

Where Cotton Grows

Cotton plants grow in warm areas in many parts of the world. Some of the top cotton-growing countries are China, the United States, Pakistan, India, and Uzbekistan.

Physical Features

In the wild, cotton plants may reach a height of 20 feet (6 meters). As a crop, cotton plants grow only 3 to 6 feet (1 to 2 meters) high.

Cotton plants produce white flowers that turn red and then fall away. The

Did You Know?

The boll weevil is the most troublesome pest that attacks cotton. Boll weevils destroy cotton bolls.



Women and children carrying goods on their heads show a traditional side of life in Cotonou, Benin.



A harvesting machine gathers the puffy buds of the cotton plant.

flowers leave behind a green pod, or fruit, called a boll. Inside each boll are 20 to 40 seeds. White fibers, which grow from the seeds' skins, surround the seeds. Eventually, the bolls burst open to reveal the fibers inside.

Different kinds of cotton plant produce fibers of different lengths. The longest fibers may be 2.5 inches (6.5 centimeters) long. These fibers go into the finest cotton cloth. Most cotton fibers are closer to 1 inch (2.5 centimeters) long.

Processing

Before cotton fibers may be made into cloth, they need to be cleaned and ginned. In ginning, a machine separates the fibers from the seeds. Next, a machine cards the fibers, or combs them into the same direction. Machines then pull and twist the fibers into long strands, called yarn. The yarn may be treated with chemicals, dyed, or combined with other types of fiber. Finally, a machine weaves the yarn into cloth.

Uses

Cotton is one of the most popular fibers worldwide. People use it to make clothing, sheets, towels, carpets, sails, and many other textiles, or cloth goods. Cotton cloth may be light or heavy. It is easily washable and comfortable to wear.

People use cottonseeds to make oil for cooking, cosmetics, and soap. Livestock eat cottonseeds and the leftover parts of cotton plants.

History

People in ancient India, China, and Egypt grew and used cotton. Early peoples in the Americas also grew cotton. Arab traders brought cotton to Europe by about AD 1000.

Cotton was difficult to process until 1793, when U.S. inventor Eli Whitney created the cotton gin. This machine separated cotton fibers from the seeds. Farmers in the U.S. South soon produced more cotton than ever before.

► More to explore

Fibers • Plant • Textile • Whitney, Eli

Cough

A cough is a sudden burst of air out of a person's lungs. Coughs happen when something irritates, or bothers, the respiratory system. The respiratory system is the group of organs that allows people to breathe.

Materials that cause a cough come from various places. Smoke, dust, chemicals,



A cough may be a sign of a cold or other illness.

and pollution in the air all can trigger a cough. Illnesses such as colds, influenza, and pneumonia also can cause a cough. These illnesses cause parts of the respiratory system to make more of a thick, sticky fluid called mucus. The mucus builds up and makes it harder to breathe. Coughing brings the mucus up and out of the mouth. Mucus may also drip down the back of the throat from the nose. Coughing helps to clear this mucus from air passages.

Coughing is good for the body. It is the body's way to get rid of anything in the respiratory system that does not belong there. However, a cough that does not go away may be a sign that the person has a serious disease.

► More to explore

Cold, Common • Respiratory System

Country

A country is land that is controlled by a single government. Countries are also called nations. Countries can be large or

small. Australia, Brazil, Canada, China, Russia, and the United States are large countries spread over millions of square miles. The world's smallest country, Vatican City, covers less than 1 square mile (2.6 square kilometers).

A country's land does not have to be connected. For example, the U.S. states of Alaska and Hawaii are separated from the other 48 states but are still part of the country. Some countries are made up of groups of islands. Indonesia and the Philippines are examples of island countries.

In some countries nearly all the people belong to a single ethnic group. These people are united by a shared history and culture. Denmark, Norway, and Sweden are examples. But other countries are made up of many different ethnic groups. Except for the Native Americans, the United States is made up of immigrants, or people who came from other countries. China and India, each with more than a billion people, have many different ethnic groups.



The flags of many countries fly outside the United Nations building in New York City.

Most countries are divided into smaller parts called states or provinces. A state has its own government. The country's government shares power with the state governments. The laws made by the country's government affect all the people of the country. The laws made by a state government affect only the people of that state.

Almost all countries belong to an organization called the United Nations, or the UN. The UN tries to solve disagreements between countries peacefully. It meets in New York City.

► More to explore

Government • State Government
• United Nations

Country Music

Country music, also called country and western, is a style of music that began in the southern United States. The center of country music is Nashville, Tennessee. However, country music is played all over the United States and as far away as Australia. Many country songs are about the lives of people in rural areas and their difficulties.

Early country musicians played mostly fiddles, banjos, guitars, and string basses. Later musicians added electric basses, pedal steel guitars, keyboards, and drums.

Country music has its roots in the folk music of England, Scotland, and Ireland. Settlers brought this music to North America in the 1700s and 1800s.



A country music group performs on a river in Louisiana.

People in the Appalachian Mountains and other parts of the South created their own form of this folk music. Radio stations began broadcasting it in the 1920s. People called it hillbilly music until the 1940s. It then became known as country and western music.

The earliest popular performers of country music included Jimmie Rodgers and the Carter Family. In the 1930s such singers as Gene Autry and Roy Rogers sang country songs in movies about cowboys in the West. In the 1940s new types of country music included honky-tonk and bluegrass. Honky-tonk featured steel guitars, while bluegrass featured traditional banjos and fiddles. Hank Williams helped make honky-tonk popular. Bill Monroe is considered the inventor of bluegrass.

Some leading country performers of the 1950s and 1960s were Patsy Cline, Johnny Cash, Tammy Wynette, and Merle Haggard. Later country stars included Willie Nelson, Waylon Jen-

Did You Know?

The young Elvis Presley and others played a kind of music that combined rock with country. Their music was sometimes called rockabilly.

nings, Dolly Parton, Randy Travis, Garth Brooks, Reba McEntire, and Lyle Lovett.

► More to explore

Folk Music • Music • Nashville

Cowbird



The brown-headed cowbird lives in North America.

As their name suggests, cowbirds often live among cattle and other large mammals. They feed on insects stirred up as these animals graze. Cowbirds are songbirds that are related to grackles, orioles, meadowlarks, and most types of blackbird.

Cowbirds are common in North America. The best-known species, or type, is the brown-headed cowbird. Another species, the bay-winged cowbird, lives in South America.

Most male cowbirds have shiny black feathers, while the females are usually

grayish brown. Male brown-headed cowbirds have brown heads and black bodies.

Bay-winged cowbirds are the only cowbirds that build their own nests. Most cowbird species lay their eggs in the nests of other types of birds. These other birds then sit on the cowbird eggs along with their own. When a cowbird chick hatches, the host birds often feed and care for it as if it were their own. Cowbird chicks tend to hatch a day or two before the other birds. They also grow quickly. These facts give them an advantage over the other birds when it comes to being fed.

► More to explore

Bird • Blackbird • Songbird

Coyote

The coyote is a wild member of the dog family. Its scientific name is *Canis latrans*. It is known for its cleverness and its nighttime howls.

The coyote lives over a wide area, from Alaska in the north to Central America in the south. It can be found throughout the continental United States. Sometimes coyotes live near people, such as at the edges of cities.

Coyotes are similar to wolves, but they are smaller and more lightly built. Most adult coyotes weigh 20–50 pounds (9–23 kilograms) and are 3–4 feet (1–1.2 meters) long, including the tail. Their fur is long and full. Most coyotes are grayish brown with white on the

Did You Know?

The coyote is one of North America's fastest land animals, with a top speed of 40 miles (64 kilometers) per hour.



Coyotes are most commonly seen at dawn and dusk.

throat and belly. They have bushy tails, often with a black tip.

Coyotes are active mostly at night. They often hunt alone, typically for rodents and hares. Groups of coyotes, called packs, may chase larger animals such as sheep. Coyotes communicate with each other using barks, yaps, and howls. While chasing prey, they can run up to 40 miles (64 kilometers) per hour. Coyotes also eat plants and dead animals.

Coyotes in captivity have lived 18 years or more. The life span of wild coyotes, however, is much shorter.

► More to explore

Dog • Wolf

Crab

► see Crustacean.

Crafts

► see Decorative Arts.

Cranberry

Cranberries are fruits with a sour taste. People use cranberries to make sauces, jellies, baked goods, and juice. Cranberries contain minerals and vitamins A and C.

Cranberries grow in wet, spongy soil in places called bogs. Cranberries grow in natural bogs in North America, Asia, and Europe. People also grow cranberries in bogs that they create themselves. The United States is the leading cranberry producer.

Cranberries may be round, oval, or pear-shaped. They range in color from pink to very dark red. Some are white.

Cranberries grow on small plants that form vines. Short branches grow from the vines. Small leaves and flowers grow on the branches. The flowers develop into berries. Botanists (people who study plants) call cranberries true berries. Like blueberries and other true berries, cranberries are single fruits that grow from a single flower. In contrast, strawberries



Cranberries grow well along the coast of the U.S. state of Washington.

and some other berries are really clusters of fruits that grow from one flower.

Cranberry growers usually collect the fruit by a method called water harvesting. First they flood the bog. Then they use machines to knock the berries off the plants. The berries float to the surface, which makes them easier to collect.

► More to explore

Blueberry • Bog • Fruit • Strawberry

Crazy Horse

Crazy Horse was a war leader of the Oglala, a tribe of the Sioux Indians. He was born in about 1842 near what is now Rapid City, South Dakota. As early as 1865 he was leading his people in the Plains Indian Wars. The Indians waged these wars to stop non-Indians from invading their lands.

In 1868 Sioux leaders agreed to keep their people on a reservation. Crazy Horse refused to honor that agreement. He and his followers left the reservation for bison (buffalo) country, where they continued to hunt, fish, and wage war against enemy tribes as well as whites.

In 1874 gold was discovered in an area of the Sioux reservation that the Indians considered to be sacred ground. White miners ignored Indian treaties and swarmed over the area. Army troops were sent to protect the miners, but Crazy Horse and his followers forced them to leave in June 1876.



A huge statue of Crazy Horse is being carved out of a mountain in South Dakota. The model in front shows what the statue will look like when it is completed.

Later that month the Sioux fought U.S. soldiers led by Lieutenant Colonel George Custer. During this famous battle Custer and all of his men were killed.

Crazy Horse was pursued by U.S. troops. He finally surrendered on May 6, 1877. While being held prisoner at Fort Robinson, Nebraska, Crazy Horse was killed on September 5, 1877, during a struggle with U.S. soldiers.

► More to explore

Custer, George Armstrong • Sioux

Cree

The Cree are one of the largest Native American groups in Canada. They originally lived in the forests of eastern Canada. They eventually expanded their territory far into the plains of western Canada.



A Cree boy dressed in traditional costume attends an event in Canada.

The Cree traditionally hunted, fished, and gathered berries and wild plants for food. They used the bark of birch trees to build cone-shaped houses similar to tepees. They also used birch bark to make canoes.

In the early 1600s traders from France and England began arriving in Cree lands. The Cree traded furs to the Europeans in exchange for guns, tools, cloth, and other goods.

Over time some Cree moved west to the plains of what are now Saskatchewan and Alberta. These Cree became known as the Plains Cree. The Cree who stayed in the east became known as the Woodland Cree. By the late 1700s the Plains Cree had given up their old way of life. They got horses and began hunting bison (buffalo) on horseback. These Cree also built tepees.

In the 1800s the Cree lost much of their land to white settlers. Most Cree settled on reservations that the Canadian government set aside for them. At the end of the 20th century more than 60,000 Cree lived in Canada. About 2,500 Cree lived in the United States.

Creek

The Native Americans known as the Creek originally lived in a huge territory in what are now Georgia and Alabama. The Creek were a confederacy, or group, of separate tribes. The English called all of the tribes the Creek because they lived mainly along rivers and creeks. The Creek call themselves the Muskogee (or Muscogee).

The Creek divided their towns into “white towns” and “red towns.” White towns were dedicated to peace, and red towns were set apart for war planning and ceremonies. The Creek lived in rectangular houses made of pole frames cov-



Me-Na-Wa was a chief of the Creek people.

ered with mud. The roofs were made of grass or bark. The Creek planted fields of corn, beans, and squash. They also hunted and fished.

Spanish explorers invaded Creek territory in the 1500s. Later the Creek sided with English colonists in wars against the Spanish. In the early 1800s the Creek fought over land with European settlers. In the 1830s the U.S. government forced the Creek to move to Indian Territory (now Oklahoma).

The Creek later adopted European customs. They also became known as one of the Five Civilized Tribes, along with the Cherokee, the Chickasaw, the Choctaw, and the Seminole. At the end of the 20th century there were about 40,000 Creek. Most lived in Oklahoma.

► More to explore

Cherokee • Chickasaw • Choctaw
• Native Americans • Seminole

Cricket

The chirping of crickets is a common sound in the summer. Crickets are jumping insects. Although they have wings, most are not able to fly. Crickets are closely related to grasshoppers.

There are about 2,400 species, or types, of cricket. They live in warm areas of the world. Crickets can be found in fields, trees, and bushes.

Crickets are 0.1 inch to 2 inches (3 to 50 millimeters) long. They are usually brown, black, or green. They have long,



Crickets make a chirping sound by rubbing their front wings together.

powerful hind legs that they use for jumping. Most crickets have two pairs of wings. The wings in the front are tough and stiff. The wings in the back are long and thin. They help crickets jump. Crickets also have long, thin antennae that they use to smell and touch.

Crickets are usually active at night. After spending the day hiding, they come out when it is dark to find food. Crickets eat mostly plants.

Crickets use chirps to communicate with each other. They chirp by rubbing their front wings together. Usually only male crickets chirp. They have different “songs” for different purposes. The most common songs are used to attract females.

Many people think that house crickets bring good luck. In eastern Asia male crickets are kept in cages so people can hear their songs.

► More to explore

Grasshopper • Insect

Did You Know?

Some crickets chirp faster in higher temperatures.

Cricket

Cricket is an outdoor team sport played with a bat and ball. It developed in England. It is also very popular in places that England once ruled as colonies, such as Australia, India, Pakistan, South Africa, and the West Indies. More than 90 countries are members of the sport's governing body, the International Cricket Council.

Playing Area and Equipment

Cricket is played on an oval field. In the center of the field is a long rectangular area called the pitch. The pitch is 22 yards (20 meters) long and 10 feet (3 meters) wide. A marker called a wicket is set in the ground at each end of the pitch. Each wicket is made up of three sticks, called stumps, placed closely together. Two small pieces of wood, called bails, are placed on top of each wicket.

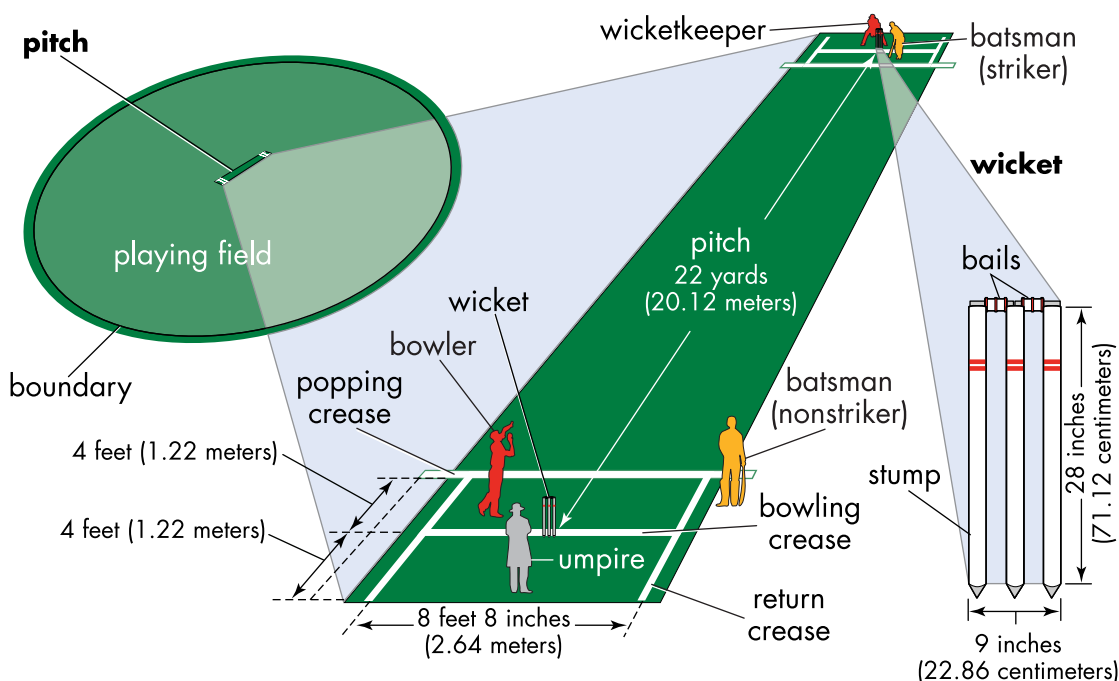
A cricket bat is about 3 feet (1 meter) long. The hitting surface of the bat is flat. A cricket ball is red or white.

Playing the Game

Two teams of 11 players compete in a cricket game, or match. The team that scores more runs (or points) wins. Cricket matches with scores in the hundreds are common.

When a cricket match starts, there are two offensive players in the pitch. They carry bats and are called batsmen. The batsmen stand at opposite ends of the pitch from each other, one near each wicket. One batsman, the striker, uses his bat to hit the ball. The batsman at the opposite wicket is called the non-striker.

The key player on the defensive team is called the bowler. The bowler stands near the wicket across the pitch from the



A diagram shows the layout of a cricket field and the positions of the players.

striker. The bowler tries to deliver, or bowl, the ball past the striker. The bowler takes a running start and then hurls the ball with an overhand, straight-arm delivery. Most balls are delivered so that they bounce in front of the striker and the wicket. The bowler tries to hit the wicket with the ball. If the ball knocks a bail off the wicket, the striker is dismissed, or put out. This means that his turn at bat is over.

The striker tries to keep the bowler from hitting the wicket. He also tries to hit the ball onto the field to score runs for his team. If the striker hits the ball, the two batsmen can run across the pitch to the opposite wicket. They can keep running back and forth between the wickets until the fielders put them out. Each time both batsmen reach the opposite wicket, they score a run.

Sometimes the striker hits the ball but decides that he does not have time to run to the opposite wicket. In such cases the batsmen do not have to run. Play continues, and the bowler delivers the next ball. The striker can earn six runs automatically (without running between the wickets) by hitting the ball over the field's outer boundary.

Fielders can dismiss the batsmen in a number of ways. For example, a fielder can catch a batted ball before it hits the ground. Also, a fielder holding the ball can dismiss a batsman by knocking a bail off a wicket before the batsman gets there.



A striker swings his bat.

Each batting session is called an innings (always plural). A team completes an innings after 10 players have batted. Cricket matches vary in length. Some matches last an afternoon. Others take days to complete.

History

People in England may have played cricket as early as the 1200s. A set of rules for the sport was written in the 1700s. In the 1800s and 1900s the English brought the game into their colonies throughout the world. An international cricket competition called the World Cup was first held in 1975. It takes place every four years.

Crime

A crime occurs when a person breaks a law. Governments pass laws against actions that they consider to be harmful or dangerous. If someone breaks a law they are punished in some way by the government that passed the law. Crimi-



Punishment for serious crimes often includes a stay in prison.

nal laws vary from place to place and change over time. This makes it difficult to say exactly what crime is.

Types of Crime

Different societies divide crimes into different groups. In the United States and the United Kingdom, the most serious crimes are called felonies. Murder and robbery are felonies. Governments often punish felonies with long prison terms or sometimes with death. Less serious crimes are called misdemeanors. Driving past a stop sign without stopping and shoplifting are misdemeanors. The punishment for a misdemeanor may be a short prison term or simply a fine.

Crimes can also be divided into attacks on people and attacks on property. A person can commit a crime against another person by hurting, kidnapping, or killing that person. A person can commit a crime against property by stealing it, damaging it, or destroying it.

Crime may affect just one person or an entire society. Governments view crimes

that affect many people as especially serious. Treason is the crime of betraying one's country. For example, trying to overthrow the government or helping the country's enemies are both forms of treason. Terrorism is the use of violence to achieve political goals. Terrorist crimes include bombing, hijacking, and assassination. War crimes break rules that have been established by many countries together. These rules establish how people should act during times of war. War crimes include mistreating prisoners or killing groups of innocent people. Governments work together to punish leaders who commit war crimes.

Organized Crime

Many criminals commit crimes on their own. Other criminals work in groups. Some groups of criminals run illegal businesses to make money. This is called organized crime. These criminals often sell drugs, weapons, or other illegal things that are considered to be harmful to society.



Shoplifting, or taking something from a store without paying for it, is a crime.

► More to explore

Law • Terrorism

Crimea



The Crimea is a peninsula, or piece of land surrounded by water on three sides. It lies on the north shore of the Black Sea in Ukraine, a country in eastern Europe. The Perekop Isthmus is a strip of land that joins the peninsula to the mainland.

Steppes, or grasslands, cover the northern part of the Crimea. South of the

steppes lie the Crimean Mountains. The peninsula's climate is mild and dry.

The steppes and mountain slopes of the Crimea are very good for growing crops. Farms there produce wheat, corn, cotton, flowers, grapes, and tobacco. Crimeans also quarry, or mine, marble and limestone in the mountains. Tourism is another important part of the economy.

In the 1300s the Tatars, a Muslim people, settled in the Crimea. Russia took over the peninsula in 1783. The Crimea became part of the Soviet Union in 1921. In 1954 the Soviet government transferred Crimea to the Soviet republic, or state, of Ukraine. After Ukraine gained independence in 1991, Crimea became a republic of Ukraine.

► More to explore

Black Sea • Ukraine



Tourists visit the seafront of Yalta, Ukraine, on the southern coast of the Crimea.



Croatia

Formerly a part of the nation of Yugoslavia, the country of Croatia declared its independence in 1991. After several years of war, peace returned to Croatia in the late 1990s. The capital is Zagreb.

Geography

The Republic of Croatia lies on the Balkan Peninsula in southern Europe. The Adriatic Sea, to the southwest, separates Croatia from Italy. Slovenia, Hungary, Serbia, Montenegro, and Bosnia and Herzegovina form the rest of Croatia's borders.

Along the Adriatic coast are the region of Dalmatia and the Istrian peninsula. More than 1,000 small islands lie off the coast. The peaks of the Dinaric Alps rise in the western parts of Croatia. In the north is the Pannonian plain, where most farms are located. The Sava and the Drava are two of Croatia's largest rivers.



The Dalmatia region of Croatia borders the Adriatic Sea. The coastline is known for its beaches and picturesque cities.

Forests of beech, fir, and other trees cover less than one third of Croatia. Wildlife includes bears, deer, wild pigs, and lynx.

People

More than half of Croatia's people live in cities and towns. Croats, a Slavic people, make up about 90 percent of the population. Most follow Roman Catholicism and speak Croatian. Serbs make up less than 5 percent of the population. Most Serbs follow Eastern Orthodox Christianity and speak Serbian. There are smaller groups of Bosniacs (Muslims), Italians, Hungarians, and others. The civil war of the 1990s forced many ethnic minorities out of Croatia.

Economy

Mining and manufacturing are the most important industries in Croatia's economy. Croatia's natural resources include petroleum (oil) and the mineral gypsum. Factories produce food products, transportation equipment, electrical machinery, clothing, chemicals, and metals. Shipbuilding provides jobs along the coasts.

Services—for example, education, health care, and banking—are also important to the economy. Tourism is a growing industry.

Farmers grow corn, sugar beets, potatoes, wheat, and grapes to make wine. They raise pigs, sheep, and cattle, especially in the mountainous regions. Along the coast, fishing provides food and employment.

History

The Croats probably began to settle in what is now Croatia in the 500s. In the 900s, Croatia became an independent kingdom, but in 1091 Hungary conquered Croatia. For most of the next eight centuries Croatia remained a part of Hungary, and later Austria-Hungary. After World War I destroyed the empire of Austria-Hungary in the early 1900s, Croatia became independent.

Creation of Yugoslavia

Croatia then joined the newly formed Kingdom of Serbs, Croats, and Slovenes. The new nation united the lands of Serbia, Croatia, Slovenia, Macedonia, Bosnia and Herzegovina, and Montenegro.



An outdoor café sits among the remains of an ancient building in Split, Croatia.

In 1929 the state was renamed the Kingdom of Yugoslavia. After World War II, Communists took control of the country. They named it the Federal People's Republic of Yugoslavia.

Civil War

With the end of Communism in the late 1980s, old tensions between the nations of Yugoslavia resurfaced. In 1991 Croatia declared its independence from Yugoslavia, which was dominated by Serbia. Yugoslav troops invaded to try to stop Croatia from leaving. Some of the other republics of Yugoslavia also declared their independence, and the fighting spread throughout the area. As Yugoslavia fell apart, Serbs, Croats, and Muslims continued to fight. In 1995 the leaders of Croatia, Serbia, and Bosnia and Herzegovina finally signed a peace agreement. Croatia began to rebuild itself as an independent, democratic state.

► More to explore

Balkan Peninsula • Yugoslavia

Facts About CROATIA



Population
(2008 estimate)
4,433,000

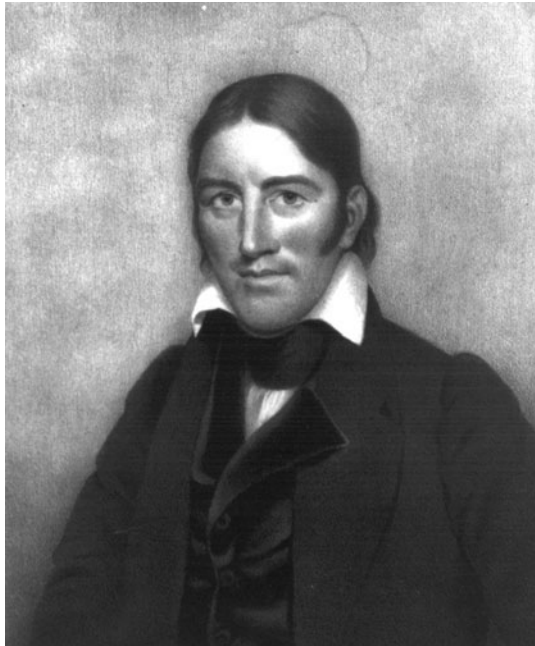
Area
21,851 sq mi
(56,594 sq km)

Capital
Zagreb

Form of government
Republic

Major cities
Zagreb, Split,
Rijeka, Osijek,
Zadar

Crockett, Davy



Davy Crockett

Davy Crockett was famous in his own time as a fighter, lawmaker, and frontiersman in a coonskin cap. After his death he became a hero of “tall tales” and a symbol of the American spirit.

David Crockett was born on August 17, 1786, in eastern Tennessee. To help support his family, he went to work as a cattle driver at age 12. He also became an excellent rifleman and hunter. Between 1813 and 1815 he served in the U.S. Army. He fought the British and their Native American allies during the War of 1812.

After returning home, Crockett became colonel of the Tennessee state militia, a citizen fighting force. In 1821 he was elected to the Tennessee legislature. He later served three terms in the U.S. Congress. Although he had little schooling,

his Army service and his folksy manner made him popular.

In 1835 Crockett went west to fight in Texas’ war for independence from Mexico. He died on March 6, 1836, when the Mexican army captured the Alamo in San Antonio. Crockett’s heroic death added to his legend.

► More to explore

Alamo

Crocodile

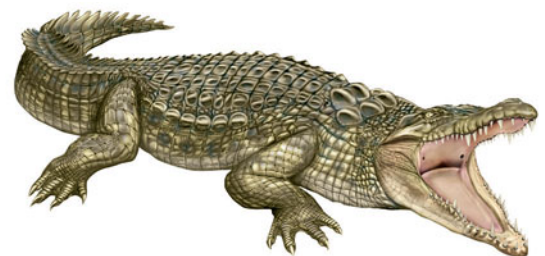
Crocodiles are lizardlike, flesh-eating animals. They are the largest living members of the group of animals called reptiles. They are related to alligators.

Where Crocodiles Live

Crocodiles are found in parts of Asia, Africa, Australia, and the Americas. Most live in swamps, lakes, and rivers in hot and warm regions. Some live in the ocean. Although they spend most of their time in water, they also travel on land.

Physical Features

There are more than 10 species, or types, of crocodile. They vary greatly in size. The dwarf crocodile measures only 6 feet (1.8 meters) in length. On the



The estuarine crocodile is the largest living reptile in the world.

side view

alligator



crocodile

Crocodiles and alligators both have long snouts. But crocodiles have large teeth that stick out when the mouth is closed.

other hand, the estuarine crocodile may grow to more than 20 feet (6 meters).

Like alligators, crocodiles have tough skin composed of many large plates and scales. The eyes, ears, and nostrils are on top of the head. They allow a crocodile to see, hear, and breathe even when most of it is floating underwater. This helps it surprise and catch large prey.

Although crocodiles look like alligators, it is easy to tell them apart. When an alligator closes its mouth, none of its bottom teeth show. Many large teeth stick out of both the top and bottom jaw of a crocodile's closed mouth. Crocodiles also tend to have narrower, pointier snouts than alligators.

Behavior

Crocodiles eat mainly fish, turtles, birds, and other small animals. They capture water animals in their jaws with a side-ways motion. They seize land animals by the feet and drag them toward the water.

After crocodiles mate, the female lays eggs. Some types can lay more than 100 eggs. The female builds a nest of mud

and dead leaves to protect the eggs. But crocodiles do not take care of their young once they hatch.

► More to explore

Alligator • Reptile

Crow

The Native Americans called the Crow were great hunters and warriors of the northern Great Plains. They called themselves the Absaroka (Children of the Large-Beaked Bird), which was translated by Europeans as “crow.”

The Crow were originally united with the Hidatsa, a farming people who lived in what are now North and South Dakota. In the early 1700s the Crow broke away from the Hidatsa and traveled west, settling in the Yellowstone River region. There the Crow gave up



An old photograph shows a Crow woman holding her child in a cradleboard, which is worn on the back.

farming to become bison (buffalo) hunters.

While on the hunt, the Crow lived in temporary camps of cone-shaped tepees. They used bison skins to cover their tepees and to make clothing. They ate bison meat and also gathered berries, roots, and other wild plants for food.

In the early 1800s white traders and settlers began arriving in Crow territory. At first the Crow were friendly to the newcomers. Many Crow men joined the U.S. Army as scouts. In the 1860s and 1870s they helped the Army in battles against other Plains Indians. But at the same time American settlers disrupted the Crow way of life. White hunters killed the great bison herds. In 1868 the Crow agreed to move to a reservation in Montana that covered only a small part of their traditional homeland. At the end of the 20th century there were more than 9,000 Crow, mostly in Montana.

► More to explore

Native Americans

Crow

Crows are large birds with shiny black feathers. They often live together in large families. They are known for their loud voices and their intelligence. These clever, curious birds have a reputation as thieves and pranksters. They have been known to fly off with all sorts of little shiny objects, including people's car keys. Pet crows have even learned to mimic, or imitate, human speech.



Like all types of crow, the carrion crow has shiny black feathers.

Crows belong to the group of birds called songbirds. However, their calls are typically harsh sounding, as in the “caw” of the American crow. There are more than 20 species, or types, of crow. They look much like ravens, their close relatives. They are also related to jays and magpies.

Various types of crow are found nearly all around the world. They live in many different habitats, including woodlands, farms, and cities. The American crow is common in the United States and Canada. The carrion crow is found in Europe and much of Asia. Other well-known types include the fish crow, the pied crow, and the house crow.

Crows tend to be smaller than ravens. Large crows may reach about 20 inches (50 centimeters) long. They are all or mostly black. Crows have powerful

Did You Know?

The Crow performed a ritual called the Sun Dance. It was to help young warriors fight their enemies.

beaks, which they use for catching small animals and opening seeds.

Crows eat a great variety of plants and small animals. Since they eat corn and other grains, they can be a nuisance to farmers. However, they also help farmers by eating insect pests.

► More to explore

Bird • Magpie • Raven • Songbird

Crusades

In wars called the Crusades, Christians from Europe fought Muslims for control of Jerusalem and other holy places. The word *crusade* comes from the Latin word *crux*, meaning “cross.” The Christian soldiers, called Crusaders, wore the cross as a symbol of their religion. The Crusades took place between 1095 and 1291.

Jerusalem is a holy city to several religions. Muslims controlled Jerusalem for

hundreds of years before the Crusades. However, they allowed Christians to make pilgrimages to the city.

In 1071 a new Muslim group called the Seljuk Turks took control of Jerusalem. They were hostile to Christian pilgrims. They also attacked the Byzantine Empire, which was Christian. The Byzantine emperor feared that they would attack Constantinople (now Istanbul, Turkey), his capital. He asked the pope for help. In 1095 the pope urged Christians to take back Jerusalem.

First Crusades

The main army of the First Crusade left Europe in August 1096. The Crusaders captured Jerusalem on July 15, 1099.

Most of the Crusaders then returned home. Others stayed in the Holy Land and established Christian states. In 1144 the Turks captured one of the Christian states. German and French rulers then called for the Second Crusade. It was a failure for the Christians.

The Muslim leader Saladin conquered Jerusalem in 1187. The kings of England, France, and Germany launched the Third Crusade against him. They were not able to recapture Jerusalem. However, the English king signed a peace treaty with Saladin in 1192. It allowed Christian pilgrims to visit holy places in Jerusalem.

Crusades of the 1200s

The Fourth Crusade started in 1202. The Crusaders planned to attack the Muslims in Egypt. However, the plan

Did You Know?

The Roman Catholic church made King Louis IX of France a saint to honor his efforts as a Crusader.



A drawing from the 1200s shows European soldiers sailing to fight in the Crusades.



A group of children participates in one of the Children's Crusades of 1212.

changed when the Crusaders passed through Venice. The Venetians got the Crusaders to capture Zara (now Zadar, Croatia), a Christian city that competed with Venice for trade. Then the Venetians and the Crusaders seized Constantinople. In 1204 they looted the city.

In 1212 two separate groups of children set out for Jerusalem. Some children died during the difficult journey. Others were captured and sold into slavery. Neither of the Children's Crusades got near Jerusalem.

French and German Crusaders reached Egypt in 1218 as part of the Fifth Crusade. In 1219 the Muslims offered to give up Jerusalem if the Crusaders would leave Egypt. The leader of the Crusaders refused. Later he was defeated.

Frederick II, the Holy Roman emperor, set out on the Sixth Crusade in 1228. He signed a treaty with the leader of Egypt that gave the Christians control of

most of Jerusalem. In 1244, however, the Turks took Jerusalem back. This led to the Seventh Crusade in 1249. Louis IX, king of France, was the leader. He was captured and held before being released in 1250. In 1270 Louis led the Eighth Crusade. He died of plague, however, and the Crusade failed.

The Crusaders then lost their fighting spirit. In 1291 the Muslims recaptured the last of the Christian states in the Holy Land.

► More to explore

Christianity • Islam • Pilgrimage

Crustacean

Crustaceans are animals that usually have a hard covering, or exoskeleton, and two pairs of antennas, or feelers. People around the world eat many types of crustacean—for example, crabs, lobsters, shrimps (or prawns), and crayfish. Barnacles, water fleas, and pill bugs are



The American lobster is one of the largest crustaceans. It can weigh up to 44 pounds (20 kilograms).



Hermit crabs are crustaceans. Some people keep them as pets.

also crustaceans. All crustaceans are arthropods. This is a group of animals that also includes insects and spiders.

Where Crustaceans Live

Crustaceans live throughout the world, mainly in water. Some species, or types, of crustacean live in freshwater. Others live in salt water. Barnacles are sea crustaceans that usually attach themselves to surfaces—for example, rocks, boats, clams, or even whales. Some types of crab live both in water and on land.

Land crustaceans live in rocky, sandy, or muddy areas. Some types are so small that they live in the spaces between sand grains. Other types are found among damp leaves on forest floors.

Physical Features

The basic crustacean body consists of a number of segments, or sections. A section of the exoskeleton covers each segment. To allow the body to grow, the crustacean sheds, or molts, its exoskel-

eton from time to time. It then develops a new one.

At the front end of the body is a region called the acron. This is the head on most crustaceans. At this end, adult crustaceans often have antennae and mandibles, or jaws. Several pairs of limbs grow from the middle section of the body. Many species have different types of limbs for walking, swimming, or mating. Some species have limbs with pincers, or claws. The tail end differs in form, depending on the species.

One of the largest crustaceans is the American lobster, which may weigh up to 44 pounds (20 kilograms). Another large crustacean is the giant Japanese spider crab. Its legs may span up to 12 feet (3.7 meters). Water fleas, fairy shrimp, and brine shrimp are some of the smallest crustaceans. Most are shorter than 0.25 inch (6 millimeters).

Behavior

Crustaceans may eat plants, animals, or the remains of living things. Some types of crustacean live off the material on the bodies of fish or other sea animals.

To reproduce, crustaceans lay eggs. Some species carry the eggs on their body. The young of many species hatch from the eggs as larvae, or young that look nothing like their parents. In other species, the young look like tiny adults.

► More to explore

Exoskeleton • Insect • Spider

Did You Know?

Whale lice are crustaceans that live on the body surfaces of whales.

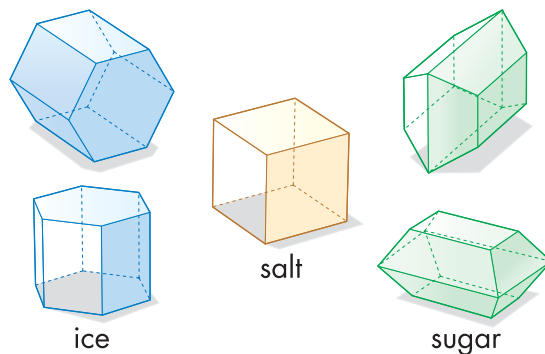
Crystal

In science, a crystal is a certain type of solid object. Scientists describe matter, or everything that can be seen, according to the way it is made. All matter is made up of tiny parts called atoms and molecules. If those parts are arranged in a regular pattern then the object is a crystal. On the outside crystals have a regular pattern of flat surfaces that meet in sharp corners.

Most matter that is not alive is made up of crystals. Common substances such as sugar and salt are made of crystals. So are metals such as gold, silver, copper, and iron. Diamonds, emeralds, and other gems (precious stones) are also crystals. Some objects that seem solid are not made of crystals, however. Glass is one such example. Its molecules are not arranged in any particular pattern.

Kinds of Shapes

The way a substance's atoms or molecules are joined together creates a crys-



Different substances form different crystal shapes. But all crystals of the same substance have the same shape.

tal's shape. Crystals form in many different shapes. However, all crystals of the same substance have the same shape. For example, salt molecules join together in a cube shape. Therefore, salt crystals are cubes. Sugar crystals are column-shaped and slanted at the ends. Quartz crystals are six-sided columns.

Objects that are not made of crystals do not always have the same shape. When glass breaks, it shatters into many pieces. These pieces have different sizes and shapes.

How Crystals Form

Most crystals form when a liquid changes to a solid. Water freezing is a familiar example of this process. As water freezes, its molecules line up and join to form ice crystals. Snowflakes are collections of ice crystals. Crystals also form when a liquid with matter dissolved (melted) in it dries up. For example, when salt water dries up, salt crystals form.

► More to explore

Jewelry and Gems • Matter



A sparkling rock crystal is made up of many six-sided columns. This rock is a type of quartz.

Cuba



The island of Cuba has seen many changes since it was spotted by Christopher Columbus in 1492. It became known worldwide for its sugar industry but often had an unstable economy. In the 1900s Cuba was involved in several national and international conflicts. Many of those concerned the country's ties to the political and economic system known as Communism. The capital is Havana.

Geography

Cuba lies in the Caribbean Sea, about 90 miles (145 kilometers) south of Florida. The country includes a long, narrow main island and about 2,000 smaller islands. Most of Cuba is made up of plains. Mountains and hills cover about a quarter of the main island. Cuba is warm year-round. Hurricanes sometimes hit the country in the summer and fall, during the rainy season.

Plants and Animals

Thousands of types of flowering plants grow in Cuba. Forests of tropical trees cover about one fifth of the land. Royal palms are common in rural areas. Animals include small mammals, iguanas, frogs, and scorpions. Sharks, mollusks, and manatees live in Cuba's waters.

People

About one third of Cuba's people are white, many with a Spanish background. A smaller number of people are

the descendants of African slaves. More than half of all Cubans have mixed white and black roots. Spanish is the main language. Although the government looks down on religion, many Cubans practice Roman Catholicism or Santería (a religion of African origin). About three fourths of the people live in cities.

Economy

Trade, services, and manufacturing are the most important economic activities. Much of the industry in Cuba is related to the country's agricultural and natural resources. Tobacco and food products are the major manufactured items. Sugar, made from sugarcane grown on large plantations, is Cuba's main export. Mines provide nickel, and the waters provide fish. Factories also make chemicals, transportation equipment, and nonelectrical machinery.





A band performs in Havana, Cuba.

History

Columbus claimed Cuba for Spain in 1492. After the Spanish began settling there in 1511, warfare and disease soon killed the native Taino and Ciboney peoples. The Spanish brought in African slaves to work on sugarcane plantations.

Following the Spanish-American War of 1898, Spain granted Cuba independence. The Republic of Cuba was established in 1902. It suffered from government instability, corruption, and widespread poverty.

In 1959 Fidel Castro overthrew the government and took power. He made Cuba a Communist country. Other Communist countries, particularly the Soviet Union, gave Cuba their support, and some Cubans hoped that Castro would put an end to the country's problems. Many Cubans who did not like Communism, however, left the country. In 1961 a force of 1,500 people who opposed Castro invaded the Bay of Pigs, southeast of Havana. They tried to capture Cuba but failed.

Cuba's relationship with the United States suffered because the United States opposed Communism. The United States refused to trade with Cuba. It also threatened Cuba in 1962, when it discovered that the Soviet Union had placed nuclear missiles in Cuba. The event became known as the Cuban Missile Crisis. It ended when the Soviets withdrew the missiles.

In 1991 the Soviet Union collapsed and Cuba lost an important source of support. But Castro remained in power until 2008, when his brother Raúl became president. Raúl made some changes, but the United States still limited trade with Cuba.

► More to explore

Caribbean Sea • Castro, Fidel
• Columbus, Christopher
• Communism • Havana • Spanish-American War

Facts About CUBA



Population
(2008 estimate)
11,236,000

Area
42,804 sq mi
(110,861 sq km)

Capital
Havana

Form of government
Socialist republic

Major cities
Havana, Santiago de Cuba, Camagüey, Holguín, Santa Clara, Guantánamo



A market in front of the Cathedral of San Cristóbal in Havana, Cuba, is a busy place.

Cuckoo



An adult reed warbler feeds a large cuckoo chick.

The birds called cuckoos are named for the sounds they make. Because of their shy personality, these birds are more often heard than seen.

More than 125 different types of cuckoos are found throughout the world. Examples include the common cuckoo, the yellow-billed cuckoo, and the birds called roadrunners, coucals, and anis. Most cuckoos live in forests, where they hide in thick vegetation. Other types live in open areas. Most cuckoos eat insects, especially caterpillars.

Cuckoos range in length from about 6½ to 36 inches (17 to 91 centimeters). Most of them are drab gray or brown. A few types have some brightly colored or glossy feathers. The cuckoo has a long tail and medium to long legs. Its outer toes point backward. Its bill is usually short and curves down a bit.

Some kinds of cuckoos, including the common cuckoo, do not raise their own young. Instead, they lay eggs in the nests of other kinds of birds that have similar-looking eggs. In this way the cuckoos trick the other birds into keeping the cuckoo eggs warm and caring for the young cuckoos. However, many cuckoos, including the roadrunners, care for their own eggs and young.

► More to explore

Bird • Roadrunner

Cucumber

The cucumber is a vegetable plant that people often make into pickles. It is related to melons, squashes, and pumpkins. The scientific name of the cucumber is *Cucumis sativus*.

People grow cucumbers all over the world. In colder places cucumbers grow in greenhouses. In milder places they grow in fields or in home gardens.



Cucumbers grow on vines. In the United States they are grown in home gardens as well as on large farms.

Cucumbers grow on long, creeping vines with fuzzy leaves. The parts that people eat are long, firm, and green. They develop from yellow flowers. The flesh inside a cucumber is pale green to almost white. In the center are small, white seeds.

Cucumbers are crisp and have a mild flavor. People eat cucumbers in salads and on sandwiches. People also pickle them, or preserve them with salt and vinegar. Cucumbers do not provide a lot of nutrition, but the green peel contains vitamins A and C.

► More to explore

Melon • Pumpkin • Squash • Vegetable

Culture

Culture is a pattern of behavior shared by a society, or group of people. Many different things make up a society's culture. These things include food, language, clothing, tools, music, arts, customs, beliefs, and religion.



Weddings in the United States, Nigeria, and India show that different cultures celebrate marriage in different ways.

Differences and Similarities

Every human society has its own culture. Each culture is unique. A group's environment often decides the type of culture that develops. For example, a group that lives in a cold, mountainous region would develop a culture different from a group that makes its home in a hot, desert region.

Scientists who study human culture are called anthropologists. Anthropologists have found that certain parts of culture are universal. This means that all people all over the world share these behaviors. All societies have ways of dealing with relatives, telling good from bad, making art, playing games, choosing leaders, and raising children. However, each culture does these things in different ways.

How Culture Changes

Older people pass culture down to younger people. In this way a group can keep the same traditions for many years. However, culture also changes over time. This may happen when the environment changes. It also happens when

different groups come into contact with one another. Each group brings new ideas that can cause changes in the other group's culture. Sometimes conflict happens when different cultures come into contact. Other times the contact is peaceful, and the groups share their cultures in positive ways.

Earliest Culture

Culture began to develop after early humans began to make tools. Humans eventually developed customs around the creation and the use of tools. These customs were early forms of culture.

► More to explore

Anthropology

Cumberland Gap

A natural mountain pass, the Cumberland Gap is located near the point where Kentucky, Virginia, and Tennessee meet. It was cut through the Cumberland Plateau in the eastern United States by streams many years ago.



Thomas Walker discovered the pass in 1750. American frontiersman and hero Daniel Boone helped build the Wilderness Road, the first trail through the pass, in the 1770s. The gap was named for the duke of Cumberland, who was the son of King George II. It became the main route used by pioneers moving west to settle the land beyond the Appalachian Mountains.

In 1940, 32 square miles (83 square kilometers) of the plateau, with the gap as the central feature, were reserved as the Cumberland Gap National Historical Park.

► More to explore

Boone, Daniel

Curie Family

Four different members of the Curie family played an important role in the history of nuclear physics. The science of nuclear physics deals with the nucleus, or center, of atoms. All four Curies earned Nobel prizes for their work.



Fog swirls around the Cumberland Gap.



Marie Curie

Marie and Pierre

Marie Curie was born Maria Skłodowska in Warsaw, Poland, on November 7, 1867. Her family valued education, but women were not allowed to study at the University of Warsaw. Instead, Maria saved enough money to study in Paris, France. In 1891 she entered the Sorbonne, a university in Paris. In France she began calling herself Marie.

Marie completed degrees in physics and in math within three years. She then began doing research in the laboratory of chemist Pierre Curie. Pierre was born in Paris on May 15, 1859. He and Marie married on July 25, 1895. They had two daughters, Irène and Ève. Irène became a scientist like her parents. She was born in Paris on September 12, 1897.

Their Work

Marie began studying the rays (beams of energy) given off by the element ura-

nium. She named the unusual activity of these rays radioactivity. Pierre soon joined Marie in her research. In 1898 the Curies announced their discovery of polonium and radium, two other elements that were radioactive. In 1903 they won the Nobel prize in physics for their work. The Nobel prize is the most important award that a scientist can receive. The Curies shared the prize with Henri Becquerel, who first discovered uranium rays.

Pierre died on April 19, 1906, after being run over by a horse-drawn carriage. Marie continued their research. In 1911 she received the Nobel prize in chemistry for her many further discoveries.

Irène and Frédéric Joliot

Irène Curie began to work at her mother's side. She earned an advanced degree in physics in 1925. In 1926 Irène married Frédéric Joliot, another scientist working in her mother's laboratory. Frédéric was born in Paris on March 19, 1900. In 1934 the couple discovered that radioactivity could be made artificially. The following year they won the Nobel prize in chemistry for their work.

Marie did not live to see her daughter accept the award. Her many years of exposure to harmful radioactivity had made her very sick. She died on July 4, 1934. Irène died on March 17, 1956. Frédéric died on August 14, 1958.

► More to explore

Atom • Nobel Prize

Cush

► see Kush.

Custer, George Armstrong

In 1876 Lieutenant Colonel George Armstrong Custer led his U.S. Army unit into battle against a group of Native Americans. This group consisted of Sioux, Cheyenne, and Arapaho. Custer and all his men died in the battle, called the battle of the Little Bighorn. Yet Custer remains one of the best-known and most popular figures in U.S. history.

Early Life

George Armstrong Custer was born in New Rumley, Ohio, on December 5, 1839. He spent most of his childhood in Monroe, Michigan. After high school he



George Armstrong Custer

enrolled at the United States Military Academy at West Point, New York.

Army Career

During the American Civil War, Custer fought for the North. He was famous for being very brave and aggressive. When the Civil War ended, Custer became lieutenant colonel of an Army unit called the 7th Cavalry.

In 1874, looking for gold, Custer led soldiers into the Black Hills of what is now South Dakota. The U.S. government had recognized the northern Great Plains as the sacred hunting grounds of certain Native American tribes. Many white miners, however, ignored that fact and began to settle on the hunting grounds. When the Native Americans complained, the government ordered the U.S. Army to drive them off the land.

Custer's unit was supposed to prevent the Native Americans from escaping attack by the main force of soldiers. Instead, Custer ordered an attack on a group that had been assembled by the Sioux chief Sitting Bull in a nearby camp. Custer's attack was one of the greatest disasters in the history of the U.S. Army. The Native Americans surrounded Custer's force near the Little Bighorn River and killed all the men.

Death and Legend

Custer died with the rest of the 7th Cavalry on June 25, 1876. After Custer's death, people remembered him as a hero. The battle of the Little Bighorn became the subject of songs, books, and paintings.

Did You Know?

Custer once left his post to go visit his wife. The Army suspended him for one year without pay.

Custer's reputation slowly changed in the late 20th century, when people began to recognize the Native American side of the story. In 1991 the U.S. Congress changed the name of the battlefield monument from the Custer Battlefield to the Little Bighorn Battlefield.

► More to explore

Cheyenne • Sioux • Sitting Bull

Cycling

The use of a bicycle for pleasure, transportation, or sport is known as cycling. Both children and adults ride bicycles for fun and for exercise. Some people use bicycles for transportation because it is less expensive than traveling by car. Others use bicycles for transportation because bicycles, unlike cars, do not pollute the air.

The sport of cycling consists of races that are held mostly on roads or tracks. Sport cycling began in 1868 with a race near Paris, France. The first recorded



Russian cyclists compete at the 2004 Olympics.



Some of the world's top cyclists compete in a championship road race. The International Cycling Union holds world championships every year.

race in the United States was held in 1878 in Boston, Massachusetts. The most famous bicycle race, the Tour de France, began in 1903. Cycling is also a part of the Summer Olympic Games.

Road Racing

Sport cycling includes road races for men, women, and children. Some races cover short distances of 2.5 to 3 miles (4 to 5 kilometers). Others cover hundreds of miles. A stage race consists of a series of races held over several days or even weeks. The Tour de France is a stage race that covers more than 2,200 miles (3,500 kilometers), mainly in France. It takes three weeks to complete. The world's best riders compete in it.

Time trials are a type of competition in which cyclists do not race directly against each other. Instead, individual cyclists or teams are timed as they ride separately over a certain distance. The cyclist or team with the fastest time wins. Most stage races include time trials.

Track Racing

Several types of bicycle races are held on an oval track. The track may be either indoors or outdoors. In the high-speed races called sprints, cyclists compete against each other over a short distance. The pursuit is an event in which cyclists start on opposite sides of the track and try to catch each other. In a motor-paced race, each cyclist rides behind a motorcycle or motorbike. The motorcycle cuts through the wind, which normally slows a bicycle down. As a result, cyclists can go much faster than they can in other races.

Another form of track racing is bicycle motocross (BMX). BMX races are held on short dirt tracks with many jumps and turns.

► More to explore

Bicycle

Cypress

Cypresses are evergreen trees and shrubs. There are about 20 different species, or types, of cypress. They grow in warm parts of Europe, Asia, and North America.

Cypresses reach heights of 80 feet (25 meters) or more. Some cypresses have a pyramid shape. Others grow into tall columns. The bark is sometimes smooth, but it usually forms plates or strips. The leaves are small and overlapping. They look like scales covering the branches.



Cypress trees stand along a winding road in Italy.

Cypresses belong to the large group of plants called conifers. This means that they produce cones that hold their seeds. Cypress cones have a woody or leathery covering and are usually round.

Cypress wood resists rotting and pests. For this reason people use cypress wood to make fences, docks, and other outdoor structures. People also plant cypresses in parks.

Only the plants belonging to the scientific group called *Cupressus* are true cypresses. But other trees are also called cypresses. The trees called false cypresses differ from true cypresses because they have smaller cones with fewer seeds. Bald cypresses grow in swampy parts of southern North America. They are known for their knobby “knees,” which are actually part of their root system.

► More to explore

Conifer • Tree

Did You Know?

Some cypresses are rare trees. The Monterey cypress can be found growing wild only in two groves near the central California coast.



Cyprus

The island of Cyprus has been divided for many years between its Greek and Turkish populations. The Republic of Cyprus is the official government of the island. Only Turkey considers the Turkish Republic of Northern Cyprus, which controls the northern third of the island, to be a separate country. The capital of both states is Nicosia—called Levkosía in Greek and Lefkosa in Turkish.

Geography

Cyprus lies in the eastern part of the Mediterranean Sea. It is about 40 miles (64 kilometers) south of Turkey and 480 miles (772 kilometers) southeast of mainland Greece.

Cyprus has mountains in the north and the south with a flat plain in between. Its long coastline is jagged and rocky, with sandy beaches. Cyprus has hot, dry summers and rainy winters. Its rivers



The sandy beaches of Cyprus are a popular vacation spot.

flow only in the winter; they dry up in the summer.

Plants and Animals

Olive, carob, and citrus trees grow in the north. Pine, dwarf oak, cypress, and cedar forests cover the southern Troodos Mountains. Wildflowers and flowering bushes grow in the central plain.

Many years ago the island was home to elephants, hippopotamuses, deer, and boars. The only large wild animal in Cyprus today is the agrino, a type of wild sheep. Millions of birds fly over Cyprus during their migrations each year, and many types spend winters there. Green and loggerhead turtles are found on the island's beaches. They are protected by law.



People

The two main ethnic groups of Cyprus are Greeks and Turks. Greek Cypriots make up the majority. They are mostly Eastern Orthodox Christians. The Turkish Cypriots are Muslims. Greek and Turkish are the official languages, but English is considered a second language in both populations. Most of the people live in cities.

Economy

Services, including tourism, are the main economic activities of Cyprus. Manufacturing and construction are also important. Greek Cyprus produces food products, cement, cigarettes, wine, and vehicles. Turkish Cyprus produces mainly clothing. Farms in both areas grow citrus fruits and potatoes.

History

People have lived on Cyprus for more than 7,000 years. The first Greek settlers arrived between 2000 and 1000 BC. They founded new cities, which became the capitals of six ancient Greek kingdoms on Cyprus. Later, the Persians, the Egyptians, the Roman Empire, and the Byzantine Empire took control at various times.

The Ottoman Turks captured Cyprus in 1571 and continued ruling for more than three centuries. The British leased Cyprus from the Ottomans in 1878 and took it as their own in 1914.

After World War II (1939–45) the long-standing conflict between the Greek and Turkish communities intensified. Many



Part of an ancient Roman temple still stands in Cyprus. The ancient Romans began ruling Cyprus more than 2,000 years ago.

Greek Cypriots wanted to be part of Greece, while many Turkish Cypriots wanted the island split into two political areas. Cyprus gained independence in 1960, but the two groups soon began fighting.

In 1974 the military forced out the president of Cyprus, and forces from Turkey invaded the north. In 1975 the northern part of the island became the Turkish Federated State of Cyprus. The north declared itself the independent Turkish Republic of Northern Cyprus in 1983. This declaration was condemned by the United Nations. By the early 21st century the two sides were working toward reunification, but only Greek Cyprus joined the European Union in 2004.

► **More to explore**
Greece • Nicosia • Turkey

Facts About CYPRUS



Population
(2008 estimate)
805,000

Area
3,572 sq mi
(9,251 sq km)

Capital
Nicosia

Form of government
Republic

Urban areas
Nicosia, Limassol,
Larnaca

Czar

► see Tsar.

Czechoslovakia

The country called Czechoslovakia existed in central Europe from 1918 through 1992. It was formed after World War I from parts of the defeated empire called Austria-Hungary. On January 1, 1993, Czechoslovakia split into two countries: the Czech Republic and Slovakia. The capital of Czechoslovakia was Prague.

Geography and People

Czechoslovakia shared borders with Germany, Poland, Ukraine, Hungary, and Austria. Its three main regions were Bohemia, Moravia, and Slovakia. The Bohemians and the Moravians together were known as Czechs. They had most of the power, which angered the Slovaks.

Most of the people of Czechoslovakia spoke Slavic languages. However, there

were many German speakers in an area called the Sudetenland.

History

During World War II, Czechoslovakia was taken over by Germany. In 1945, as the war was ending, the army of the Soviet Union freed Czechoslovakia. Then Communists backed by the Soviets took control. Czechoslovakia struggled under Communist rule. Its farms produced fewer crops. The people lost many freedoms.

The Communist government was unpopular. In 1968 a leader named Alexander Dubcek tried to make the government more democratic. The Soviet Union did not like the changes. It forced out Dubcek. The new government went back to strict control.

In the 1980s protests against the government began to work. In 1989 the Communist government resigned. Václav Havel became the country's first non-Communist president in more than 40 years. The last Soviet troops left in 1991.

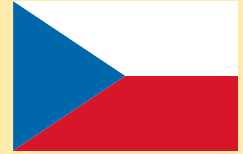
After Communism ended, relations between Czechs and Slovaks worsened. The people of Slovakia voted to form a separate country. At midnight on December 31, 1992, Czechoslovakia broke up. The Czech Republic and Slovakia took its place.

► More to explore

Austria-Hungary • Czech Republic
• Prague • Slovakia • Union of Soviet Socialist Republics



Czech Republic



The Czech Republic is a country in central Europe. It was formerly part of the Communist country of Czechoslovakia. The independent Czech Republic came into being in 1993. The country is known for its picture-book towns, its polka dance, and the architecture of its capital, Prague.

Geography

The Czech Republic is bordered by Slovakia, Austria, Germany, and Poland. Low mountain ranges surround the country. In the southwest is the large Bohemian Forest. The country's main river is the Elbe, which flows into Germany. Most parts of the Czech Republic have a moderate climate. Winter temperatures are mild, and summers are warm. Snow and rain are heaviest in the mountains.

Plants and Animals

Spruce and fir trees are common in the high forests. Oak, ash, and maple trees grow at lower levels. Pollution from the use of coal has severely damaged the forests, however. The country's animals include wild boars, brown bears, marmots, otters, mink, and deer.

People

Czechs make up about 90 percent of the country's population. Moravians form the largest minority group. Other ethnic groups include Slovaks, Poles, Germans, and Roma (Gypsies). The official language is Czech, a Slavic language closely

related to Slovak and Polish. About 40 percent of the people are Roman Catholic. Many people follow no religion. About 75 percent of the population lives in urban areas.

Economy

Manufacturing is the most important part of the Czech Republic's economy. Factories produce machinery, food products, metals, cars, computers, chemicals, and other goods. The country has limited resources of coal, petroleum (oil), natural gas, and minerals. It must import many of the raw materials needed for its factories.

Trade, tourism, banking and other services are also important to the economy. Agriculture is a smaller part of the economy. The main crops are wheat, barley, corn, sugar beets, and potatoes.



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A field of yellow flowers brightens the countryside in the Czech Republic.

History

Germans, Celts, and Avars were some of the first peoples in Moravia and Bohemia, the two main provinces of the Czech Republic. The Slavs, ancestors of the Czechs, arrived between the 500s and the 700s. By the mid-800s the Moravians had formed a kingdom. It eventually grew into Great Moravia and included part of Poland, all of Bohemia, and part of Hungary.

The decline of Moravia in the early 900s led to the rise of Bohemia. In 1029 Moravia became part of the kingdom of Bohemia. In 1526 Bohemia and Moravia came under the control of the Hapsburg monarchy of Austria. Austria, and later the empire of Austria-Hungary, ruled Bohemia and Moravia until after World War I (1914–18).

When Austria-Hungary collapsed in 1918, Bohemia, Moravia, and neighboring Slovakia were united to form the independent republic of Czechoslovakia. Czechoslovakia soon became a Communist country. Václav Havel, a playwright and poet, was elected president of

Czechoslovakia after Communism ended in 1989.

On January 1, 1993, Czechoslovakia peacefully split into the Czech Republic and Slovakia. Havel became the first president of the Czech Republic. In 2004 the country joined the European Union.

► More to explore

Czechoslovakia • Prague • Slovakia

Facts About CZECH REPUBLIC



Population
(2008 estimate)
10,408,000

Area
30,450 sq mi
(78,866 sq km)

Capital
Prague

Form of government
Republic

Major cities
Prague, Brno,
Ostrava, Plzeň,
Olomouc, Liberec



Prague, the capital of the Czech Republic, is famous for its old architecture.

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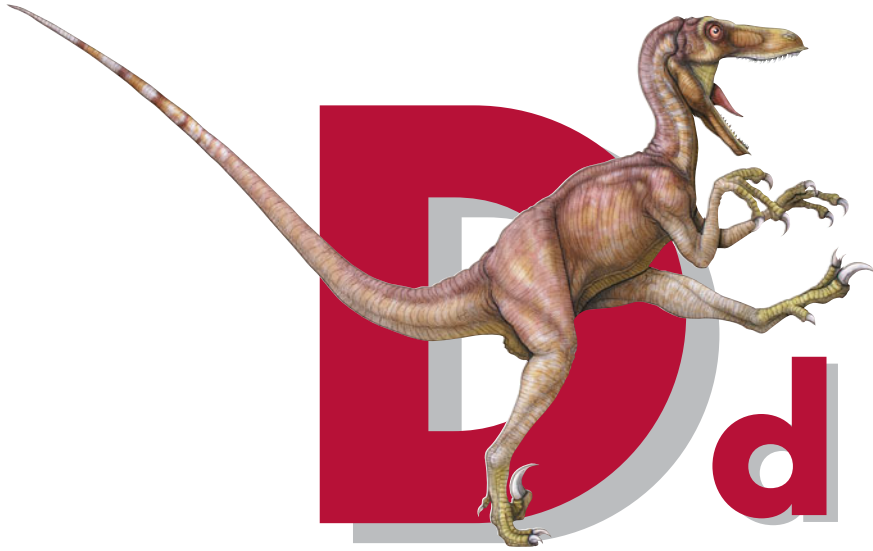
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The Dead Sea has so much salt in it that only microbes (tiny organisms) are able to live in it.

(See Dead Sea.)

Paul Revere was a hero of the American Revolution. But he was also known for making beautiful silver objects.

(See Decorative Arts.)

Not all deserts are hot and sandy. Much of Antarctica, for example, is considered a cold desert.

(See Desert.)

Some dinosaurs were the largest creatures that ever walked on land.

(See Dinosaur.)

Young dragonflies live in water and do not look like adult dragonflies.

(See Dragonfly.)

Did You Know?

Daedalus was also known as an architect and a sculptor. In ancient times many temples and statues in Greece and Italy were believed to be his work.

Daedalus

In ancient Greek mythology Daedalus was a great inventor. His son was named Icarus. Daedalus was said to have built a complex maze for King Minos of Crete. The maze was built to enclose a monster called the Minotaur. Later the king learned that Daedalus had given away the secret to the maze. He became angry and imprisoned Daedalus and Icarus in the maze.

Daedalus made wings of wax and feathers so that he and Icarus could fly to freedom. Before they escaped, Daedalus warned Icarus not to fly near the sun. The sun's heat would melt the wax. The two easily flew out of the maze. Excited by his ability to fly, Icarus soared through the sky. But he got too close to the sun, and his wings melted. Icarus fell into the ocean and drowned.

► More to explore

Mythology

Dahl, Roald

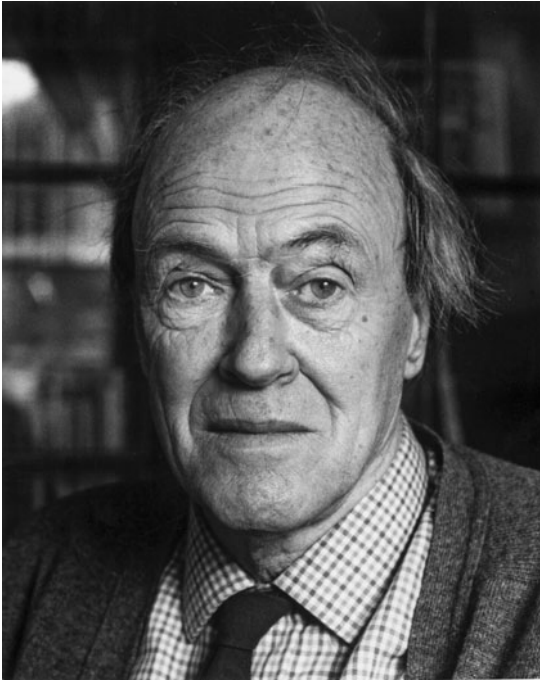
The funny and imaginative children's stories of British author Roald Dahl are favorites with readers both young and old. His action-packed tales feature memorable and often magical characters.

Roald Dahl was born in Llandaff, Wales, on September 13, 1916. His early life was difficult. When he was only 3, his sister and father died. Soon after, the family moved to Kent, England.



Daedalus made wings of wax for himself and his son Icarus. They used the wings to fly out of the maze in which they were trapped.

When World War II began in 1939, Dahl joined the British Royal Air Force. He was seriously injured during a crash



Roald Dahl

landing. Dahl's first writings were about his experiences in the military. His first children's book, *The Gremlins*, was published in 1943. It is about mythical creatures who make fighter planes crash.

During the 1950s Dahl wrote short stories for adults. After he became a father, he started making up bedtime stories for his children. In 1961 he published *James and the Giant Peach*. It was followed in 1964 by *Charlie and the Chocolate Factory*, which is about a poor child whose luck changes when he visits an extraordinary candy factory.

Dahl's later children's books included *Danny: The Champion of the World* (1975), *The BFG* (1982), and *Matilda* (1988). He died in Oxford, England, on November 23, 1990.

► More to explore

Literature for Children

Dahomey

In the 1700s and 1800s an African kingdom known as Dahomey grew rich and powerful through the slave trade. The kingdom was located on the west coast of Africa. The region is now the southern part of Benin.

Dahomey had a system of social classes. The king was at the top. Under him was the royal class, followed by commoners, and then slaves. Each government office was filled by one male and one female official. The women checked on the men and reported back to the king. Women also served in Dahomey's powerful army.

The kingdom of Dahomey arose in the 1600s from another kingdom called Alladah. European slave traders were already visiting the Atlantic coast during this time. Dahomeans began capturing people from other tribes. They sold the captives to slave traders in return for weapons and other goods. They also



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kept slaves of their own. These slaves worked on large farms that supplied food for the army and the royal court.

The empire grew larger and stronger throughout the 1700s. After Great Britain and other countries outlawed the slave trade in the 1800s Dahomey started selling palm oil instead of slaves.

At the end of the 1800s France conquered Dahomey. The French combined it with other regions to form a colony that was also called Dahomey. This colony gained its independence in 1960. It kept the name of Dahomey until 1975, when it became Benin.

► More to explore

Benin • Slavery

Daisy

Daisies are flowers with flat petals that surround a round center. Daisies belong to the aster family, which also includes chrysanthemums, dahlias, marigolds, sunflowers, and zinnias.

Common types of daisy include the oxeye daisy; the English, or true, daisy; and the Shasta daisy. These daisies grow in Europe, North America, and other parts of the world. Oxeye and English daisies grow in gardens and in the wild. The Shasta daisy is mainly a garden plant.

Daisy plants often grow to about 2 to 3 feet (61 to 91 centimeters) tall. Two types of flower make up each flower head. Ray flowers are what people call



People often use colorful daisies to brighten flower arrangements.

petals. The ray flowers may be long or short. Tiny disk flowers make up the center. The center may be flat or rounded. Depending on the type of daisy, the flower heads are from 1 to 4 inches (2.5 to 10 centimeters) wide.

Oxeye and Shasta daisies have a ring of white ray flowers around a bright yellow center. The ray flowers of the English daisy may be white, purple, pink, or red.

► More to explore

Flower • Marigold • Plant • Sunflower

Dakar



Population
(2007
estimate), urban
area,
2,243,400

Dakar is the capital of Senegal, a country in West Africa. It is the largest city in

Did You Know?

Daisies are perennials, which means that they bloom year after year without having to be replanted.



Many people in Dakar are Muslim and worship at mosques.

Senegal by far. The city lies on a piece of land that sticks out into the Atlantic Ocean.

Dakar is one of the main seaports of West Africa. The city is also a leading center of industry and services. Factories in Dakar process peanuts, fish, and petroleum (oil). Other factories put together trucks and make cloth, fertilizer, and medicines. Tourism also brings money to the city.

Gorée Island lies just south of Dakar. Europeans used the island as a base for trading slaves from the 1500s to the 1800s. The French founded Dakar in 1857.

West Africa's first railway opened in 1885. It connected Dakar with the city of Saint-Louis. Dakar soon grew into an important center for growing and shipping peanuts.

In 1904 Dakar became the capital of the colonies called French West Africa. In

1960 Senegal became an independent country with Dakar as its capital.

► More to explore

Senegal

Dakota

► see Sioux.

Dalai Lama

The Dalai Lama is the leader of the main sect, or group, of Buddhists in Tibet. Tibetan Buddhists believe that the Dalai Lama is the god of compassion who comes to Earth to help people. Until 1959 the Dalai Lama also ruled Tibet.

Tibetan Buddhism is a form of Buddhism that began in Tibet some 1,400 years ago. Its followers believe in reincarnation, which is the idea that after death a person's soul is born again in a new body. They believe that each Dalai Lama is a rebirth of the first Dalai Lama, who died in 1475.



The 14th Dalai Lama leads a prayer meeting in Varanasi, India.

When a Dalai Lama dies, Tibetan Buddhist leaders use different ways to discover where he will be reborn. They may consult an oracle, who is a holy person believed to have a message from a god. The leaders look for a child born soon after the previous Dalai Lama dies. The child must pass many tests to prove that he is the Dalai Lama. For example, the child is usually asked to identify objects that belonged to the previous Dalai Lama.

Did You Know?

The Dalai Lama is the head of the group known in English as the Yellow Hat order of Buddhists. They are called that because they wear a yellow headdress.

Once the child has passed the tests, he officially takes the throne. The Dalai Lama spends much of his time studying Buddhism and meditating.

The current Dalai Lama, Tenzin Gyatso, is the 14th Dalai Lama. He was born in 1935 to a peasant family. Before his 5th birthday he was named as the Dalai Lama. In 1950 he became the head of Tibet's government. In the same year the Chinese entered Tibet and took control of the area.

In 1959 the Chinese killed more than 80,000 Tibetans who were protesting Chinese rule. The Dalai Lama and some followers fled to India and settled in the mountains.

The 14th Dalai Lama travels around the world to promote peace and to speak about the Tibetans' desire for political independence. In 1989 he won the Nobel peace prize for his nonviolent work to end Chinese control of Tibet.

► **More to explore**
Buddhism • Tibet

Dallas



Population
(2000 census),
city, 1,188,580;
(2007 estimate)
1,240,499

Dallas is one of the largest cities in the United States. It is located in the north-eastern part of the state of Texas. Dallas lies on the Trinity River, near where the river's three branches come together.

Dallas is a center of banking, insurance, and publishing. Trade, health care, and business services are also important to the city's economy. Factories in Dallas make such products as computers, software, processed foods, and clothing.

A lawyer named John Neely Bryan founded Dallas in 1841. The town grew as a center of trade. In the early 1900s one of the world's largest cotton markets was in Dallas.

In 1930 a huge oil field was discovered in eastern Texas. Dallas grew large and wealthy as a center of the oil industry. During the middle of the 1900s many factories in the city made aircraft for the military.

Dallas' oil industry declined in the 1980s. However, the city continued to grow. Many high-technology companies

established themselves in Dallas in the late 20th and early 21st centuries.

► More to explore

Houston • Texas

Dam

A dam is a barrier that blocks flowing water or sends it in a new direction. People and animals build dams to control rivers and to create ponds or lakes. A beaver's dam works in much the same way as the giant dams that people build. Both must be high enough and strong enough to keep the water from flowing forward.

People throughout the world have built dams since ancient times. Early Egyptians built a dam almost 5,000 years ago. The Chinese built stone structures to block rivers as early as 240 BC. Two dams in Spain that were built by ancient Romans are still in use today.

Uses

People build dams to keep rivers from flooding and to save water. During heavy rains a river's waters may rise too high. Without a dam to contain it, the extra water is wasted as it flows away unused.

With a dam in place, a deep reservoir, or pool, of water builds up behind the dam. This extra water can be put to many good uses. It might be used as a lake for boating or swimming, for drinking water, for farm irrigation, or in manufacturing.



The Hoover Dam is 726 feet (221 meters) high. It is on the Colorado River between Nevada and Arizona.

The force created by water rushing through pipes in a dam is also useful. The flowing water makes wheels called turbines spin. The turbines run machines called generators, which produce electricity. This type of power is known as hydroelectric power.

How Dams Work

Most dams operate in the same basic way. The weight of the water pushing against a dam creates tremendous pressure. A dam's shape and thickness must work together to hold the water back, even when rainfall increases the pressure.

The dam wall must be made of something strong enough to keep water from breaking through. Some dams are made of earth and rock packed together to form a thick barrier. However, most dams are made of concrete. Some concrete dams are thicker at the bottom than they are at the top. They are built

that way because water creates more pressure as it gets deeper. The bottom of the dam must be thicker and stronger to hold back the deeper water. Other concrete dams have a curved shape that helps to lessen the pressure of the water. The curve sends some of the pressure to the rock walls on the sides of the dam.

A spillway is a passage over or around the dam wall. If the water behind the dam builds up to a dangerous level, some of the water is released through the spillway.

Passages called sluices are other important parts of a dam. Some water constantly moves through these passages to keep the river flowing on the other side of the dam. Gates in the passages allow workers to control the amount of water that flows through the dam.

► **More to explore**

Beaver • Electricity • Flood • Irrigation

Damascus



Population
(2004 estimate)
1,614,500

Damascus is the capital of Syria, a country in the Middle East. It is one of the world's oldest cities. For thousands of years Damascus has been an important



People walk through the entrance of a mosque in Damascus.

trading center. Today it is also Syria's center of education and culture.

Damascus is surrounded by desert. However, the city gets plenty of water from the Barada River. The only easy route through the Anti-Lebanon Mountains ends in Damascus.

Many people in Damascus work for the government. Others work in education, health care, tourism, and other businesses. Factories in the city make processed foods, cloth, chemicals, plastics, and machinery.

Damascus is at least 5,000 years old. In ancient times many groups fought to control the city and its trade.

Muslim Arabs took over Damascus in AD 635. It was the capital of the Muslim world from 661 to 750. Damascus was later an important city in a series of Muslim empires.

The Turks ruled Damascus from the 1500s to the early 1900s. It remained a major trade center. People traveling to the Muslim holy cities also bought supplies in Damascus.

France took control of Syria in 1920. Damascus underwent many changes to become more modern. In 1946 Syria became an independent country with Damascus as its capital. The city grew greatly during the 20th century.

► More to explore

Syria

Dance

Dance involves the rhythmic movement of the human body, usually to music. It is one of the oldest forms of human expression. Dance movements are often closely related to the gestures of everyday life.

Dance serves a variety of purposes in cultures around the world. Some dances mark special social events such as births, marriages, and deaths. Other dances are religious or magical. They may be performed to worship gods or to try to end famine, bring rain, or cure the sick. And dances are also performed as art, to express emotions, to tell stories, and simply for fun.

Types of Dance

There are many kinds of dance. Certain dances are associated with particular ethnic groups or cultures. They are often deeply woven into everyday life. For instance, in many societies in Africa dances are an important part of community life.

Folk dances come from a particular country or location. But these dances are no longer associated with their original purposes or meanings. Instead, people



Members of a U.S. dance company perform a dance called *Split Sides*.

often perform folk dances for entertainment and to preserve the dance traditions of their ancestors.

People perform social dances for their own entertainment. Social dances include ballroom dances such as the waltz and tango as well as newer forms such as hip-hop. On the other hand, trained dancers perform theatrical dances. They dance to entertain an audience or to provide an audience with an artistic experience. Some styles of theatrical dance are ballet, modern, jazz, tap, and classical Indian dances.

Elements of Dance

The movements of dancers' bodies create different shapes and patterns in space. Dance movements tend to be organized into a sequence of steps. The steps of traditional dances have been passed down over many years. In other dances the dancer makes up the movements during the dance. Or sometimes a dance designer called a choreographer makes up the steps ahead of time.

Rhythm is a major element in dance. Rhythm helps pace the movement. It helps give dance its emotional power too. Rhythm can also match or contrast the dancer's movements to the music.

Most dancing is done to music. The music may suggest the style or dramatic quality of a dance. One example is the Middle Eastern form of dance called *raqs sharqi* (or belly dance). In this style of dance the music sets up the mood or story. The dancer then interprets this through movement. In ballet whole sections of music may have the style of the character dancing to them.

Many types of dance are associated with special clothing. For instance, dancers may use weapons, masks, and makeup to increase the effect of war dances and hunting dances. Wearing certain clothes for ritual dances can also show that it is a sacred occasion. Theatrical dances may use costumes, scenery, and lighting. These elements may help tell a story, set a mood, or create interesting visual patterns.

History

Ancient Dance and Traditions

Paintings made in caves more than 10,000 years ago suggest that even the earliest peoples danced. The first written records of dance date back some 4,000 years to the ancient Egyptians. Dance was a crucial element in festivals for their gods. The ancient Egyptians also brought skilled dancers from central Africa to Egypt to provide entertainment.



Couples dance the tango in a ballroom.



Two dancers in Thailand perform a traditional Thai dance.

Many cultures in Asia have a long history of formal, theatrical dance. In India the earliest book discussing dance is more than 1,500 years old. *Bharatanatyam* is a classical dance form based on this book. The dances of the Japanese royal court are called *bugaku*. They were adapted from traditional dances of China, Korea, India, and Southeast Asia. Dance is also an important feature of traditional forms of Japanese drama.

For the ancient Greeks dance was an important part of religious ceremonies as well as everyday life. Dances at festivals to honor a god developed into Greek drama in the 400s BC. Later in ancient Rome religious festivals also featured dances.

Middle Ages

In the Middle Ages (AD 500–1500) in Europe traveling acrobats danced to

entertain crowds. Some festivals on Christian feast days also featured dancing. But some Christian leaders of the time thought dancing was sinful.

Social dancing became important to the nobles of the Middle Ages. The upper classes learned to move gracefully in formal dances for couples. The peasants had their own dances. They usually sang and danced in large lively groups.

Renaissance

During a period in Europe called the Renaissance (mid-1300s to 1500s) dancing became an art, not just an entertainment. The royal courts began to stage festive pageants that combined dance, music, and drama. Professional dancers began performing ballet in theaters in the 1660s. From then on ballet was a form of theatrical dancing separate from social dancing.

Theatrical Dancing

Professional dancers and teachers developed a formal ballet technique. It was based on basic poses and steps. Ballet became extremely popular in France in the 1700s. In the 1800s the French dancer Marius Petipa went to Russia. He helped make that country the center of the ballet world. In the early 1900s the Russian arts promoter Sergey Diaghilev helped spread ballet through Europe and the Americas.

At the end of the 1800s the American dancer Isadora Duncan started what is now called modern dance. She felt that the set steps and poses of ballet limited her ability to express herself. She created

Did You Know?

Ballet dancers wear special shoes, but performers of modern dance often go barefoot.

Did You Know?

Most people enjoy social dancing for fun. Some people enter competitions in which they are judged for their ballroom dancing skills.

a new form of dance that was free-spirited and highly personal. Many other dancers developed their own styles of modern dance in the 1900s. One of the most influential was Martha Graham. Her company and school trained generations of important modern dancers. Her famous students included Twyla Tharp and Paul Taylor.

The American choreographer Agnes de Mille made dancing an important part of musical theater. Her production of the musical *Oklahoma!* in 1943 mixed ballet, folk, and modern dance. The dances Jerome Robbins created for *West Side Story* (1957) brought a new edge to musical theater. Robbins influenced later Broadway choreographers such as Bob Fosse and Michael Bennett.

Social Dancing

Once ballet became a professional form, the dancing done in the European royal courts was social dancing. Starting in the 1700s dances were held in ballrooms and houses. That way more people could participate.

Over the years, various dance forms went in and out of style. Some of the most popular were the minuet (1600s and 1700s) and waltz (1700s and 1800s). As music became less formal in the 1900s, so did social dances. Popular music—from big band to rock and roll and house music—has continued to inspire new forms of social dancing.

► More to explore

Ballet • Music • Theater

Dandelion

Dandelions are plants with bright yellow blossoms that turn into round, fluffy seed heads. Many people consider these wild plants to be weeds. The several species, or types, of dandelion belong to the same plant family as daisies and sunflowers.

Dandelions grew first in Europe and Asia. They are now widespread in North America. Dandelions survive the winter and regrow each spring.

Dandelions are small plants that often grow low to the ground. Green, jagged-edged leaves surround the base of a hollow stem. The central root, or tap root, can grow as deep as 5 feet (1.5 meters). In spring and summer, each plant produces a single flower head that is made up of many tiny yellow flowers.

After flowering, dandelions produce a head of thin, brownish seeds. Each seed is attached to a feathery structure. These seeds can scatter widely in the breeze.



Many people consider dandelion flowers to be pesky weeds.

Some people eat dandelion leaves in salads. People may also make the roots into a coffeelike drink.

► More to explore

Daisy • Flower • Plant • Sunflower

Daoism

Daoism is a system of philosophy and religion that began in ancient China. It is sometimes spelled Taoism. Along with the philosophy called Confucianism, Daoism has helped to shape Chinese culture. Confucianism focuses on human society and the duties of its members. In contrast, Daoism emphasizes nature. It is more joyful and carefree.

Daoism began more than 2,000 years ago. It was based on a book called the *Daodejing* (or *Tao-te ching*). Laozi has traditionally been named as the author of the *Daodejing*. But scholars are not sure that Laozi ever existed. They now think that more than one person wrote the *Daodejing* between the 500s and the 200s BC.

For Daoists, the most important thing in life is to find the Dao. The Dao is not easy to define. It is the unchanging reality that is the source and end of everything. This means that all beings and things are one. Because all is one, life and death merge into each other. A Daoist does not fear death because it is only part of an eternal cycle.

“Dao” also is translated as “the Way,” meaning the way to think and act. Followers are taught to act in harmony with



Daoist worshippers make offerings in Hong Kong.

the natural course of things. They try to avoid disturbing the natural order. This often means that they take no action at all. Daoists believe that striving for power and wealth is a waste of energy. Such things distract people from searching for the Dao.

► More to explore

China • Confucius

Dardanelles

The Dardanelles is a strait, or narrow body of water, that connects the Aegean



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Sea and the Sea of Marmara in Turkey. It also separates the continent of Europe from the westernmost tip of Asia Minor. The strait is named for the ancient city of Dardanus. In ancient times it was called the Hellespont, meaning “Helle’s sea,” in memory of Helle, a mythical princess.

Another strait, called the Bosphorus, connects the Sea of Marmara with the Black Sea. Together the Bosphorus and the Dardanelles provide the only sea connection between the lands lying on the Black Sea and the rest of the world. The Gallipoli Peninsula lies along the western side of the strait. Major ports along its shores include Gallipoli, Eceabat, and Çanakkale, all in Turkey.

The Dardanelles came under Turkish control in 1453 and remained in Turkey’s hands until World War I. After the defeat of Turkey in 1917, the Dardanelles became part of a neutral zone under the control of the League of Nations. In 1923 the Treaty of Lausanne returned the region to Turkey.

Dar es Salaam



Population
(2002 census),
metropolitan
area,
2,336,055

Dar es Salaam serves as the capital of Tanzania, a country in East Africa.



Fishermen sell their catch at a fish market in Dar es Salaam, Tanzania.

Dodoma was named the new capital in 1974. But many of Tanzania’s government offices were still in Dar es Salaam in the early 21st century.

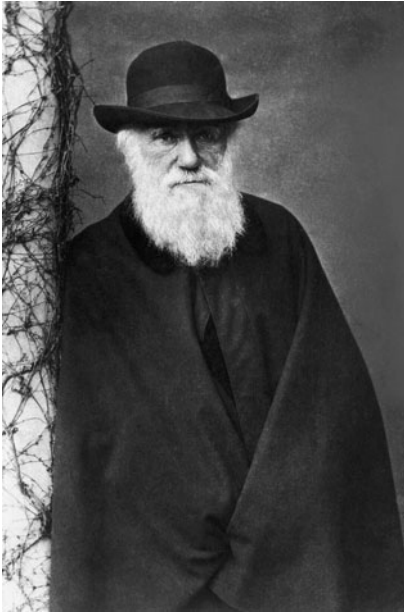
Dar es Salaam is much larger than any other city in Tanzania. The city lies on the Indian Ocean. It is Tanzania’s main port and center of manufacturing. It is also a popular tourist destination.

The sultan (king) of nearby Zanzibar founded Dar es Salaam in 1862. A German company took control of Dar es Salaam in 1887. It soon became the capital of the German colonies in East Africa. The city began to grow.

In World War I (1914–18) Germany lost its African colonies. Dar es Salaam became the capital of the new British territory of Tanganyika. The new country of Tanzania was formed in 1964. Dar es Salaam was its official capital until 1974.

► **More to explore**
Tanzania

Darwin, Charles



Charles Darwin

Charles Darwin was an English scientist who studied nature. He is known for his theory of evolution by natural selection. According to this theory, all living things are struggling to survive. The living things that have the most helpful traits for their environment tend to survive. These living things then pass along their helpful traits to their young. In this way, animals change, or evolve, over hundreds of years. He described his ideas in his important book, *On the Origin of Species by Means of Natural Selection* (1859).

Charles Robert Darwin was born on February 12, 1809, in Shropshire, England. He did poorly throughout school. Nevertheless he attended the University of Edinburgh and the University of Cambridge. A professor at Cambridge encouraged Charles's interest in natural history.

In 1831 Darwin joined an expedition to explore the coasts of South America. On December 27, 1831, Darwin and the others set sail on the HMS *Beagle*. Darwin's goal was to study the natural history of the areas they were to explore. The observations he made during the five-year trip led him to wonder how new species, or types, of plants and animals developed. To explain this process Darwin formed his theory of natural selection.

Darwin first presented his theory in 1858. The idea of evolution was not new then, but Darwin's theory explained how evolution occurred. When Darwin published *On the Origin of Species* in 1859, the book was an immediate success. However, it was not popular with people who believed that God created everything in the world all at one time. He continued writing about his theory in several other books. Charles Darwin died on April 19, 1882.

► **More to explore**
Evolution

Date

Dates are small, sweet fruits that grow in large bunches on date palm trees. A single bunch may contain as many as 1,000 dates. Dried dates have a very high amount of sugar—at least half of their total weight.

Date palms can be found in hot, dry climates. They grow in North Africa, the Middle East, South Asia, and the southwestern United States. Egypt, Iraq, Iran,

Did You Know?

Although he is famous for writing about plants and animals, during his trip on the *Beagle* Darwin also studied the forces that build up mountains.



Dates ripen on a date palm tree.

and Saudi Arabia are the largest producers of dates.

Date palms grow to a towering height of about 75 feet (23 meters). Rough, overlapping stubs, or leaf bases, cover the surface of the tree trunk. These stubs, which point upward, are the remains of old leaves. A crown of shining leaves sprouts from the top of date palms. These leaves, or fronds, can be as long as 16 feet (5 meters).

The fruits are about 1 to 3 inches (2.5 to 7.5 centimeters) long. They are usually oval. When dates are ripe, their color ranges from golden brown to black. Dates contain one long, slender seed, called a stone.

Dates have been an important food for thousands of years, especially for people in the deserts of the Middle East. Dates

are an excellent source of energy and fiber. They also contain potassium and iron. The trunks and leaves of date palms may be used for fuel or to make furniture, baskets, or rope.

► More to explore

Fruit • Palm

Davis, Jefferson

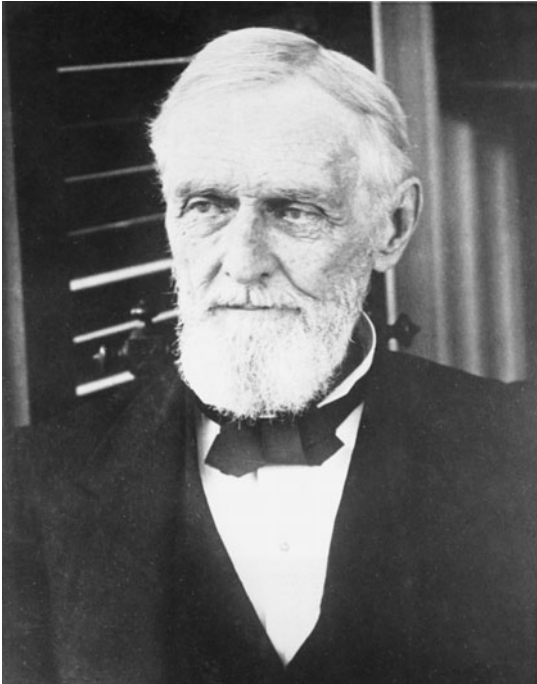
While Abraham Lincoln was president of the United States, Jefferson Davis was president of the Confederate States of America. The Confederate states were Southern states that decided they did not want to be part of the United States anymore. They disagreed with the other states about many things, especially slavery. Their disagreements led to the American Civil War.

Davis was born on June 3, 1808, in Kentucky. His parents were farmers who owned slaves. Jefferson grew up in Mississippi and graduated from the U.S. Military Academy at West Point in 1828.

Career in the United States

Davis served in the Army until 1835. He then returned to Mississippi and ran a plantation.

In 1845 Davis was elected to the U.S. House of Representatives. He left Congress in 1846 to command Mississippi troops in the Mexican War. He won a great victory at the battle of Buena Vista.



Jefferson Davis

Davis returned from the war as a hero and became a U.S. senator from Mississippi in 1847. From 1853 to 1857 he served as secretary of war under President Franklin Pierce. Davis again became a senator in 1857. At the time, Northerners and Southerners were arguing about many issues. Davis tried to get the two sides to work together, but they became more and more divided.

The Confederacy

In January 1861 Mississippi seceded, or left the Union. Several other states did the same. Representatives of those states chose Davis to be their president. He took office on February 18, 1861. Davis ordered an attack on Fort Sumter in South Carolina on April 12. The attack began the American Civil War.

As president, Davis had a hard job. The United States had more people and

more resources than the Confederacy. After four years of fighting, the Confederate troops were forced to surrender. This brought an end to the Confederate States of America.

Davis then left Richmond, Virginia, which was the Confederate capital. On May 10 he was captured in Georgia. He was put into prison for disloyalty to the United States. But he was not placed on trial. After two years he was released.

Davis spent time in Canada and Europe and then ran an insurance company in Memphis, Tennessee. He died in New Orleans, Louisiana, on December 6, 1889.

► More to explore

American Civil War • Confederate States of America

Dead Sea

The Dead Sea is actually a salt lake. It is located in southwestern Asia between Jordan on the east and Israel and the West Bank on the west. The Dead Sea





The salt from the Dead Sea collects on its shores.

has so much salt in it that only microbes (microscopic life-forms) are able to live in it. Its salt content is about seven times that of the ocean.

The Dead Sea is about 50 miles (80 kilometers) long and 10 miles (16 kilometers) wide. Its surface is 1,312 feet (400 meters) below sea level, making it the lowest body of water on Earth. Its greatest depth is in the north, where it is about 1,309 feet (399 meters) deep. The Jordan River flows into the Dead Sea from the north.

The land surrounding the Dead Sea is a desert. The hot summer temperatures cause the lake's water to evaporate at a high rate. When the water evaporates it leaves behind salt. The area gets very little rain so the water that evaporates is not replaced very quickly. Because of that, a high concentration of salt has built up in the Dead Sea over the years.

In addition to the huge amount of salt in the Dead Sea, there are also large reserves of potash, gypsum, and other chemical substances. The salt has been

used since ancient times. In the 1900s nearby factories began collecting potash, magnesium, calcium chloride, bromine, and other chemicals from the sea.

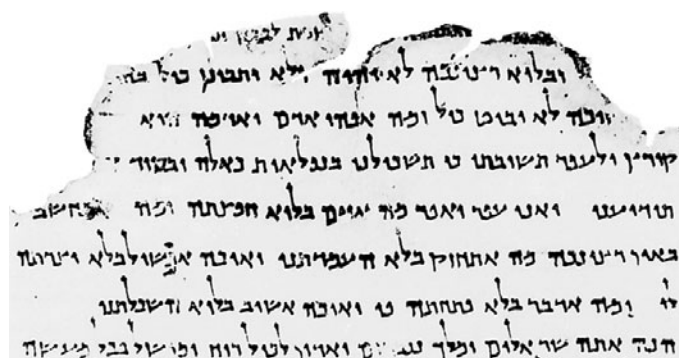
► More to explore

Israel • Jordan

Dead Sea Scrolls

In 1947 a young shepherd found some ancient scrolls (rolled-up writings) in a cave in Jordan. More scrolls were found nearby soon afterward. Now they are all known as the Dead Sea Scrolls because they were found near the Dead Sea. They are important because some of the scrolls contain parts of one of the earliest versions of the Hebrew Bible. Others are writings of the Jewish people who lived in the area more than 2,000 years ago.

The Dead Sea Scrolls are written on such materials as leather, papyrus (made from the stems of a plant), and copper. After being rolled up for so long they were dried out and would not unroll without breaking into pieces. Scholars spent years working out ways to unroll them without destroying them. Most of



A piece of the Dead Sea Scrolls shows an early form of Hebrew writing.

the scrolls and fragments are now overseen by the government of Israel.

The Bible scrolls were copies of original manuscripts. They have been useful in understanding the history of the Hebrew Bible. Other scrolls outline the rules of a community of Jews who lived on the shores of the Dead Sea from about 150 BC to AD 68. Many scholars believe that this was a group called the Essenes. Some believe that the scrolls themselves were the property of the Essenes.

Deafness



A teacher uses sign language to communicate with deaf students.

A person who is deaf either has trouble hearing or cannot hear at all. Deafness can occur in one ear or in both ears. It is called partial deafness if the person can still hear a little. It is called total deafness if a person cannot hear anything.

Causes

There are a number of reasons why people are deaf. Parents can pass down

genes that cause deafness. Diseases and head injuries can result in deafness. Ear infections can cause temporary deafness. Too much earwax can also cause temporary deafness. In some cases people lose hearing because of listening to loud noise. People often lose some hearing as they get older, too.

Prevention and Treatment

Sometimes deafness cannot be prevented or treated. This is the case when deafness is caused by genes or by old age. However, vaccines can prevent certain diseases that might damage the ears. People who work in noisy places can wear earplugs. Hearing aids help people who are partially deaf. They make sounds louder.

In some cases a doctor can perform surgery. An example would be when an ear passage is blocked. If nerves are damaged, a doctor might put a cochlear implant under the skin near the ear. This device changes sounds into electrical signals. The person then learns to recognize those signals as sounds.

Deaf people can still communicate. They can read lips. Some use their hands to make signs for letters, words, and ideas. This is known as sign language. They can also learn to speak. Many are helped by speech therapy.

Deaf people can use the telephone by typing on a special keyboard. They can also understand television shows through the closed-captioning system. This system translates the spoken words

Did You Know?

The composer Ludwig van Beethoven composed some of his greatest music after he became deaf.

to written words. The words appear at the bottom of the screen.

► More to explore

Ear • Sign Language

Death

Death marks the end of life. When a living thing dies, its body stops working. All living things, including plants and animals, go through the process of death.

How Death Happens

In humans death can happen in many different ways. Most people die from diseases related to aging. Cancer, heart disease, and other illnesses may cause death. Some people die in accidents or as a result of violence or natural disasters. In some parts of the world people die from warfare, starvation, or poor nutrition.



Cemeteries are final resting places for the dead. Many members of the military and other notable Americans are buried in Arlington National Cemetery, near Washington, D.C.

A person dies when the body's most important organs—the heart, the lungs, and the brain—stop working. Once these organs fail, other organs also stop working. Individual cells can survive longer, but eventually they also die.

People used to be considered dead when they stopped breathing and their heart stopped. Today, however, special medical techniques and equipment can restart the heart and lungs. Many people now consider brain death to be the end of human life. Brain death happens when the brain shows no signs of any activity, even if machines are keeping the heart and lungs working.

Dealing with Death

Every culture has its own customs for dealing with death. Most of these customs include either burial or cremation (burning) of the body. In addition, people often gather at funerals or other services to honor the person who died.

Many people believe that, once the body dies, a person's mind or soul continues in some kind of afterlife. Others think that the body's death is the end of that person. People have always been interested in what happens after death, but no one knows for certain.

► More to explore

Living Thing

Death Valley

Death Valley is the lowest, hottest, and driest point in North America. It got its



name because of the hardships faced by settlers attempting to cross the valley.

Death Valley is located in southeastern California, in the United States. The valley is about 140 miles (225 kilometers) long and 4 to 16 miles (6 to 26 kilometers) wide. The lowest point in the valley lies 282 feet (86 meters) below sea level. Not far away towers Mount Whitney, the highest point in the continental United States. It is 14,494 feet (4,418 meters) above sea level.

Summer daytime temperatures in the valley often reach 120° F (50° C) in the shade. Winter temperatures rarely fall to freezing. The average annual rainfall is only about 2 inches (50 millimeters).

Despite the extreme conditions, Death Valley is home to a variety of plants and animals. The plants include saltgrass, cacti, and desert wildflowers. Animals include lizards, rabbits, kangaroo rats, coyotes, and bobcats. The largest animal is the desert bighorn sheep.

For many years Death Valley was little known except to the Panamint Indians who lived in the area before the Europeans came. Few people visited the area until the 1870s. At that time, gold was discovered in the surrounding mountains. Death Valley's extreme environment now attracts tourists and scientists. It was made a national park in 1994.

► More to explore

California • United States

Did You Know?

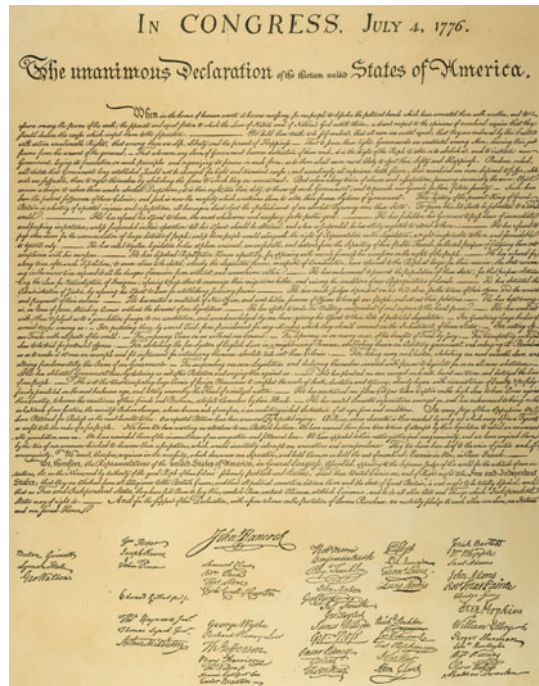
North America's highest known temperature—134° F (57° C)—was recorded in Death Valley in 1913.

Declaration of Independence

The Declaration of Independence is the founding document of the United States. On July 4, 1776, the Continental Congress of the British colonies in North America adopted the declaration at Independence Hall in Philadelphia. The document proclaimed that the 13 original colonies of America were “free and independent states.” It was the last of a series of steps that led



Dead trees are scattered among sand dunes in Death Valley.



Many important people in the early history of the United States signed the Declaration of Independence. Famous signers include Benjamin Franklin, Thomas Jefferson, and Samuel Adams.

the colonies to final separation from Great Britain.

At the time the American Revolution began with Great Britain in April 1775 most colonists were not seeking independence. They simply wanted the British government to listen to their complaints. But as the war continued, many colonists began to favor freedom from British rule.

New reasons for independence from Great Britain appeared regularly. In August 1775 King George III declared that the colonists were rebels and hired foreign troops to fight them. The British attacked the coast of Maine and did great damage in Virginia. In January 1776 Thomas Paine published the pam-

phlet *Common Sense*. It pointed out how the colonists were being mistreated by the king. Many copies of the pamphlet were sold, and support for independence grew.

On June 7 Richard Henry Lee, a Virginian, asked the Continental Congress to consider declaring independence from Great Britain. The congress appointed a committee of five to write the formal declaration. Thomas Jefferson wrote the first draft. A few changes were suggested by other members of the committee: John Adams, Benjamin Franklin, Roger Sherman, and Robert R. Livingston.

On July 2, 1776, the congress accepted the idea of independence. It then debated the content of the declaration over the next two days. On July 4 the Declaration of Independence was accepted by the representatives of 12 states. The New York delegation accepted it 11 days later. It was first published in newspapers and read aloud to crowds in towns throughout the colonies. Members of the congress signed the official parchment document on August 2. The document first lists the complaints against the English king and then makes the actual declaration.

► More to explore

American Revolution • Continental Congress • Jefferson, Thomas

Decorative Arts

Decorative art is the art of making useful things beautiful. The decorative



Glassmaking is a type of decorative art. The U.S. designer Louis Comfort Tiffany made many beautiful glass vases.

arts include pottery making, jewelry making, weaving, woodworking, and other crafts. Different cultures around the world have their own forms of decorative art.

For most of history people made decorative art by hand. In North America, Native Americans made painted pottery and delicate baskets. In the American colonies Paul Revere was well known for creating beautiful silver objects. He made silver utensils, bowls, plates, and candleholders.

In Europe and early America a young woman's education usually included decorative arts. Girls learned these skills both at school and at home. They learned embroidery and quilt design. They painted flowers and landscapes on tabletops and other household objects.

In the 1800s people began using machines to make decorative art. Factories made pottery, furniture, lamps, and rugs from designs created by artists. The factories turned out thousands of decorative objects from each design.

Arts and Crafts Movement

However, some decorative artists still wanted to create one-of-a-kind objects. Many of these artists joined a movement called the Arts and Crafts Movement. Arts and Crafts artists made stained glass windows and lamps by hand. They also made furniture and other kinds of beautiful, useful objects.

Later Developments

In the early 1900s a famous school for design opened in Germany. This school was called the Bauhaus. Artists there designed furniture and other objects for the home. They wanted everyday objects to be both useful and artistic. Bauhaus artists believed that the good design of useful things, such as forks and teapots, could improve people's lives.



People in Mexico weave blankets in colorful, traditional patterns. This type of blanket is both useful and decorative.



One of the leading designers of the Arts and Crafts Movement was William Morris. His designs for wallpaper often featured flowers or leaves in complex patterns.

Decorative art is still very popular today. Many weavers, jewelers, woodworkers, potters, and other decorative artists sell their work at art shows, in art galleries, or in shops. Many people who are not artists also enjoy making decorative objects. They learn how to create decorative art from books, magazines, and home decorating shows on television. Some people also take classes or attend special workshops.

► More to explore

Arts • Jewelry and Gems • Pottery
• Revere, Paul

Deer

Deer are the only animals that can grow large antlers. They are hoofed mammals that belong to the scientific family Cervidae. There are about 30 different species, or kinds, of deer. Among them are the white-tailed deer, the mule deer, the moose, the wapiti, and the reindeer, or caribou.

Where Deer Live

Deer are native to Europe, Asia, North America, South America, and northern Africa. People have brought them to Australia, New Zealand, and other areas. Deer live in a wide variety of places, including forests, swamps, deserts, and tundras.

Physical Features

Deer have large ears, short tails, and long, slender legs. On each foot they have two small and two large hooves. Deer usually have smooth, brown fur. White areas often cover the chest and throat. Some types have a shaggy coat, especially in the cold seasons.

The smallest deer, the South American pudu, is about 12 inches (30 centimeters) tall at the shoulder. The largest deer, the moose, may be more than 7 feet (2.1 meters) tall at the shoulder. Females are usually smaller than males.



White-tailed deer live in open wooded areas. As with most deer, only the males grow antlers.

The males of most species grow antlers, which are bony growths on the head. Female reindeer also grow antlers. Male deer use their antlers to fight other males for a chance to mate with females. Deer shed their antlers and grow a new set each year.

Behavior

Deer eat only plant material—for example, grass, twigs, and bark. They chew their food, swallow it, and then bring it back up from the stomach in a form called cud. After chewing the cud, they swallow it again.

Most deer live in small family groups, though the males generally spend some time alone. In warm climates deer mate at any time of the year. In colder climates they breed in autumn or winter. Female deer usually give birth to one or two young. Most deer reach adulthood in one to three years.

Deer and Humans

Since ancient times, people have hunted deer for their meat (called venison), hides, and antlers. Hunting deer is still a popular pastime in the United States and many other places. People also use hunting to control the number of certain types of deer.

In many parts of the world, some types of deer are endangered, or at risk of disappearing. Possible causes include too much hunting and the clearing of the land where the deer lived.

► More to explore

Mammal • Moose • Reindeer • Wapiti

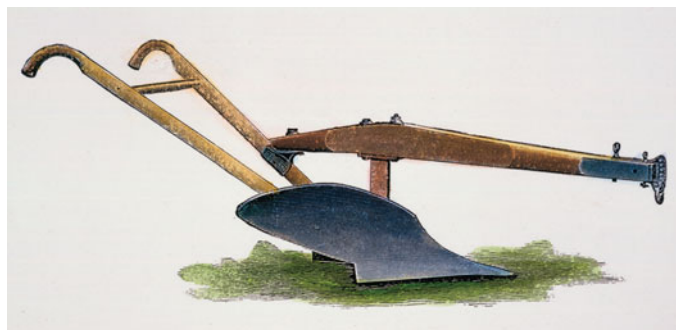
Deere, John

John Deere invented the first successful steel plow. His invention helped make the midwestern United States one of the world's great farming regions. The company he started, Deere & Company, became a leading maker of farm equipment.

Deere was born in Rutland, Vermont, on February 7, 1804. As a teenager he worked in a blacksmith's shop. At age 21 he set up his own shop. Many of his customers were farmers.

In 1836 Deere moved to Illinois. The farmers of Illinois had a troublesome problem. The soil was very good for growing crops, but it was also very hard to plow. It was so thick that it stuck to their plows, which had blades made of cast iron. Deere designed new plows with blades of polished steel. The steel plows worked well because the soil did not stick to the blades.

Soon Deere began making plows in large quantities. In 1847 he moved his factory to Moline, Illinois, and expanded it. By 1857 he was producing 10,000 plows a



A farmer stood behind John Deere's steel plow and used the two handles to guide its path.

year. In 1868 Deere's business became known as Deere & Company. Today Deere & Company makes all kinds of farm machinery.

Late in life Deere registered some of his ideas with the U.S. government as patents. He also served for several years as mayor of Moline. He died there on May 17, 1886.

► More to explore

Agriculture • Steel

De Gaulle, Charles

A military leader and statesman, Charles de Gaulle led France through several difficult periods. In 1959 he became president under a new constitution that he helped write. Throughout his career De Gaulle was guided by his belief in the greatness of France.



Charles de Gaulle

Early Life

Charles de Gaulle was born on November 22, 1890, in Lille, in northern France. He became interested in the military as a boy and graduated from the Military Academy of Saint-Cyr in 1911.

Career

De Gaulle fought in World War I (1914–18). After the war he taught military history at Saint-Cyr. He served on a military mission to Poland and also wrote several books on military subjects. When Germany occupied France at the beginning of World War II (1939–45), De Gaulle took control of the Free French resistance movement. He led the movement from England.

De Gaulle returned to Paris as a national hero in 1944 after the Germans had retreated. He became active in politics as the country tried to deal with many problems. One problem was a civil war that broke out in Algeria, which was a French colony at the time. De Gaulle finally became president of France in 1959.

After he became president, De Gaulle promoted peace negotiations in Algeria. He declared Algeria's independence on July 3, 1962. De Gaulle also increased his efforts to make France a leading world power. At his urging the French developed nuclear weapons and a space program.

Last Years

In 1968 the French government faced a students' and workers' revolt. On April

27, 1969, the people of France voted down De Gaulle's proposals for constitutional changes. The following day De Gaulle resigned. He retired to his home at Colombey-les-Deux-Églises, where he died on November 9, 1970.

► More to explore

Algeria • World War II

Delaware

The Native Americans known as the Delaware call themselves the Lenape (meaning “real people”). They are also often called the Lenni Lenape. English settlers named them the Delaware because they lived in villages along the Delaware River.

The Delaware originally lived in a huge territory that included what are now New Jersey, Pennsylvania, New York,

and Delaware. Delaware men fished and hunted deer, elk, bear, and beaver.

Women planted fields of corn, beans, squash, and other crops. The women also made clothing, baskets, and pottery.

The Delaware built dome-shaped houses called wigwams that they covered with tree bark. They also built large structures made of wood and bark called longhouses. Each autumn, people gathered at the longhouses for a 12-day ceremony. During the Big House ritual, the Delaware thanked their creator for their latest harvest. The Big House ceremony was performed until the 1900s.

In the early 1600s settlers from England, Sweden, and the Netherlands began arriving in Delaware territory. They brought with them diseases, such as smallpox and measles, that killed many tribe members.

Europeans also forced the Delaware to give up much of their land. After the colonists' victory in the American Revolution (1775–83), many Delaware moved to Ontario, Canada. The Delaware who stayed in the United States moved west. In the mid-1800s the government forced them to move to Indian Territory (now Oklahoma).

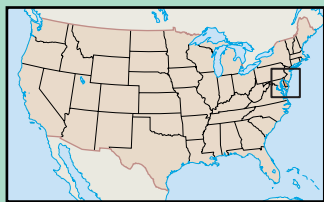
By the end of the 20th century, there were about 10,000 Delaware. Most live in Oklahoma, Wisconsin, and Ontario, Canada.

► More to explore

Measles • Native Americans • Smallpox



Tishcohan was a chief of the Delaware.



Delaware

In 1610 Englishman Samuel Argall sailed into a large bay along the Atlantic Coast of North America. He called it Delaware Bay in honor of Virginia's colonial governor Sir Thomas West, baron De la Warr (or Delaware). The name was later given to the nearby river and to the colony that became the state of Delaware. Delaware is nicknamed the First State because it was the first colony to ratify, or vote in favor of, the United States Constitution. Dover is the capital.

Geography

Delaware is a Middle Atlantic state located on the East Coast of the United States. Delaware is bordered on the southeast by the Atlantic Ocean. The Delaware River and Delaware Bay sepa-

rate it in the northeast from New Jersey. To the north is Pennsylvania. To the south and west is Maryland.

Most of Delaware is a flat coastal plain. It is seldom more than 60 feet (18 meters) above sea level, and it becomes increasingly sandy to the south. There are many woodlands, streams, and fresh-water ponds in the region. The far northern part of the state is more elevated and runs into the foothills of Pennsylvania.

People

More than 70 percent of Delaware's population are whites of European descent. African Americans make up about 19 percent of the state's population. Hispanics represent 5 percent of the population and Asian Americans 2 percent. Although Delaware's total population is less than 1 million people, it is one of the nation's most densely populated states. This means that there are many people living in a small area. Delaware's largest city, Wilmington, has a population of more than 72,000 people.

Economy

Delaware has been called the Chemical Capital of the World. This is mostly because of the DuPont Company's long connection with the state. One of DuPont's many inventions in the field of chemistry was the artificial fiber known as nylon. DuPont and Hercules, another large chemical firm in Delaware,





Visitors to Delaware's Rehoboth Beach enjoy the sun, sand, and ocean.

create products used in such things as fabrics, paper, pigments, and plastics. Credit card businesses also have operations in the state. Broiler chickens (raised for meat) are the major agricultural product.

History

The Delaware area was the home of the Delaware (or Lenni Lenape) and several other Native American tribes before Europeans began to settle the area in the early 1600s. Dutch settlers arrived in the area in 1631. They called their new home Zwaanendael, meaning “valley of the swans.”

The next European settlement was made by Swedish colonists in 1638 under the leadership of Peter Minuit. They built their homes on the site of what is now Wilmington, on the Christina River. The first permanent settlement was called Fort Christina. In 1682 the Delaware colony became part of Pennsylvania. Disagreements led the colony to

form its own legislature in 1704, but the area remained under the control of Pennsylvania's governor until 1776.

In 1776 Delaware played an important role in the passage of the Declaration of Independence. Caesar Rodney was one of Delaware's three delegates to the Continental Congress. When the two other delegates split their vote over whether to support the declaration, Rodney rode on horseback from Dover to Philadelphia in order to break the tie. His last-minute ride allowed him to cast Delaware's deciding vote for independence.

Although many Delaware residents owned slaves, the state remained with the Union when the American Civil War began in 1861. After the war, with much help from the Du Pont family, the state prospered.

► More to explore

American Civil War • Declaration of Independence • Dover

Facts About DELAWARE

Flag



Population

(2000 census), 783,600—rank, 45th state; (2008 estimate) 873,092—rank, 45th state

Capital

Dover

Area

2,489 sq mi (6,447 sq km)—rank, 49th state

Statehood

December 7, 1787

Motto

Liberty and Independence

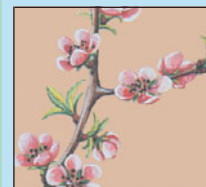
State bird

Blue hen chicken



State flower

Peach blossom



Delhi



Population
(2001 estimate),
Old Delhi,
9,817,439;
New Delhi,
294,783

Delhi was the capital of mighty empires in South Asia for hundreds of years.

Today it is divided into two cities—Delhi (or Old Delhi) and New Delhi. New Delhi is the capital of the country of India. Both cities are part of an area known as the national capital territory of Delhi.

Old Delhi grew over hundreds of years. It has narrow, winding streets and busy markets. Its living areas are crowded. Old Delhi also has many historic build-

ings. The beautiful Red Fort was built there in the 1600s.

New Delhi was built in the early 1900s. A British architect designed the city. It has wide, straight streets and many parks.

Many people in Delhi work in government, education, health care, and tourism. Delhi has long been northern India's leading center of business and trade. Factories in Delhi make cloth, electronics, tools, and other products.

Many different cities were built in the Delhi area over the years. It was the capital of a series of Muslim rulers beginning in the 1100s.

In the 1700s Great Britain began taking over parts of India. The British captured Delhi in 1803. They began building New Delhi in 1912. It became the capital of British India. In 1947 India became an independent country with New Delhi as its capital.

► More to explore

India

Did You Know?

An ancient poem tells of a city built on the site of Delhi nearly 3,500 years ago.

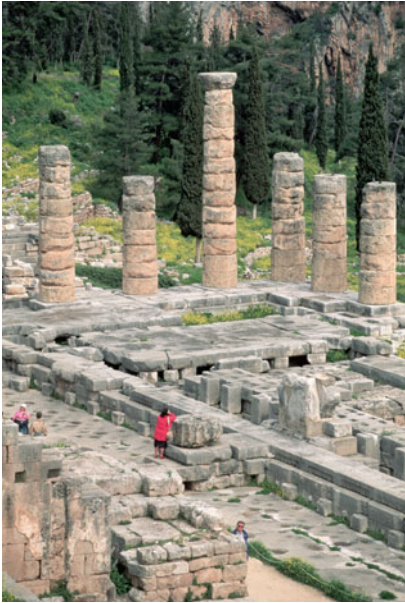


Traffic moves through a busy street in Old Delhi.

Delphi

Delphi was a town in ancient Greece. It was the home of the most important Greek oracle. The ancient Greeks asked their gods for answers to their questions and problems. An oracle was both the god's answer and the temple where people came to receive such answers.

The Greeks considered Delphi to be the center of the world. Over many years,



Visitors to Delphi today can see the ruins of one of the temples of Apollo.

several temples were built there to honor Apollo. He was the god of light, poetry and music, and prophecy, or the telling of the future.

People came from every part of Greece to learn their future through Apollo. The oracle was even consulted before any new colony was formed. People would often bring expensive gifts. Priestesses and priests would deliver the oracles to the people. The oracles were worded so that they could have two or more different meanings.

The oracle was closed in the AD 300s. Today Delphi is a popular tourist destination and a major archaeological site. Excavations have uncovered temple ruins and pieces of sculptures.

► More to explore

Apollo • Greece, Ancient

Delta

In ancient times Greek merchants who sailed to Egypt noticed that the Nile River branched into two streams before flowing into the sea. The sea and the river's branches enclosed a piece of land shaped like a triangle. The Greeks called that land a delta because it resembled the fourth letter of the Greek alphabet (Δ). Now the term delta is used for any plain made up of material deposited by a river at its mouth.

Rivers often carry a lot of soil, sand, and other material. When the flow of a river slows at its mouth, some of that material settles. Over the years the material builds up to form a delta. The surface of a delta is almost level, and the river usually flows across it in a number of small branches.

Deltas have been important to people since prehistoric times. The soil of a delta is usually ideal for farming. Major civilizations developed in the deltas of



A photograph taken from a satellite shows the Nile River delta and the Mediterranean Sea.

the Nile, Tigris-Euphrates, Indus, and Huang He rivers. More recently, scientists have discovered that the rocks of some deltas hold large amounts of oil.

► More to explore

River

Demeter

In ancient Greek mythology Demeter was the goddess of grain and farming. She was associated with the Roman goddess Ceres because they shared many characteristics. Demeter's symbols included corn and a basket filled with grain, flowers, and fruit.

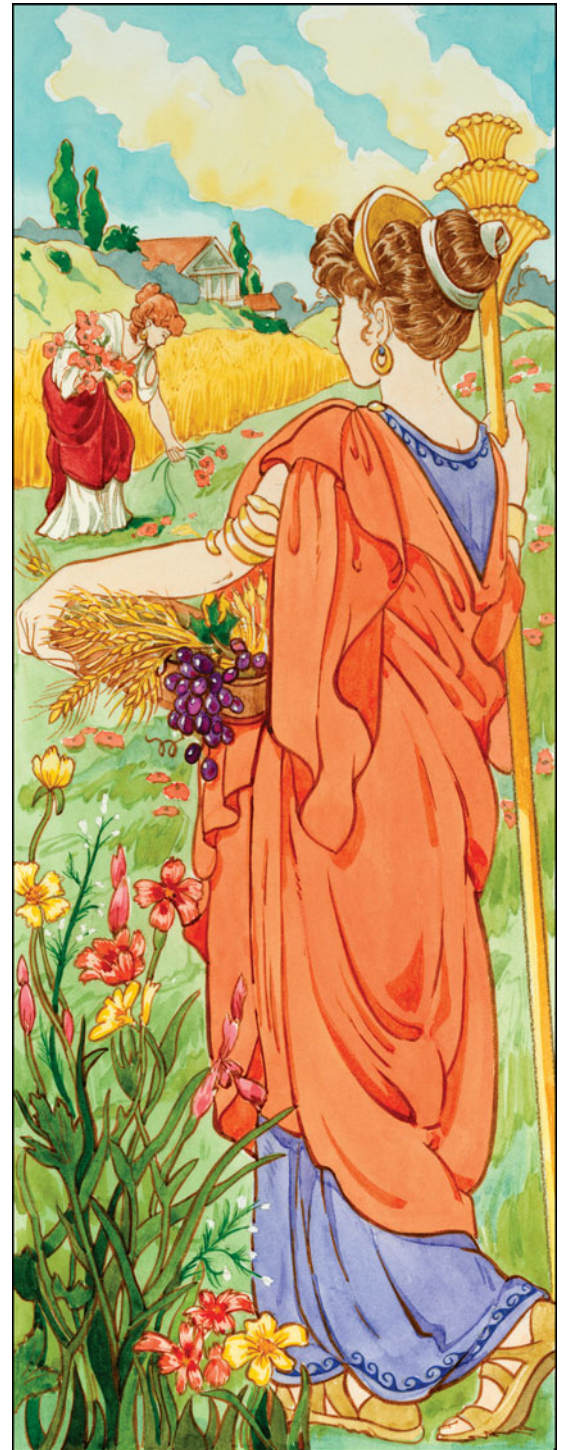
Demeter was the daughter of Cronos and Rhea, who were Titans. The Titans were giants who once ruled the world. Demeter was said to watch over all aspects of farming, including plowing, planting, and harvesting. In ancient Greece the women typically did these jobs. So Greek women often worshipped Demeter.

Did You Know?

Certain grass seeds that are good to eat are called cereals in honor of Ceres.

The ancient Greeks used a story about Demeter to explain the changing of the seasons. Demeter's daughter was the beautiful Persephone. Hades, the god of the underworld, seized Persephone. He took her to the land of the dead to be his queen. Demeter was overcome with grief. In her great sadness she did not care about helping the harvest. As a result, no crops on Earth could grow.

Zeus, the chief god, ordered Hades to give up Persephone. But in the underworld Persephone had eaten the seed of



a fruit called a pomegranate. Because of this, she would always be connected to the land of the dead. For part of each year she would have to return to Hades. When Persephone was gone, Demeter refused to let anything grow. Winter then fell over Earth. But when Per-

sephone returned, Demeter made all the plants bloom in celebration. It was then spring.

► More to explore

Hades • Mythology

Democracy

The word democracy describes a form of government. The word comes from two Greek words that mean “rule by the people.” In a democracy the people have a say in how the government is run.

They do this by voting, though there are usually rules about who can vote.

Democracies are different from dictatorships. In a dictatorship one person called a dictator makes all the rules.

Types of Democracy

There are two main forms of democracy. In a direct democracy all the voters come together in one place to make laws and decisions. Often there are too many people for a direct democracy to work. In those cases the people elect representatives, or other people to speak for them. This is called a representative democracy. The elected representatives make the laws and decisions.

History

The first democracies were in ancient Greece more than 2,000 years ago. Those did not last long, however. After that, kings and other rulers had all the power in their countries. In about the 1200s, however, some rulers began to allow certain citizens to be part of the government.



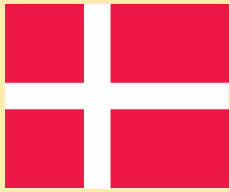
People line up to vote in Sierra Leone, a country in Africa.

By the 1600s and 1700s some people began to think that all people had certain rights. These included the right to participate in their government. In the British colonies of North America the colonists felt that the king did not allow them to participate enough. They fought a war to gain their freedom. When they won the war they established the United States as a republic.

A republic is a form of democracy in which the citizens vote for the people who make the laws. They also vote for the leader of the country, who is often a president. Many other countries became republics as well. Other countries kept their kings or queens but still became democracies. Monarchies with democracy are called constitutional monarchies. In such countries the people vote for representatives. The king or queen is the head of the country, but they have little real power.

► More to explore

Government • Voting



Denmark

The Kingdom of Denmark is the southernmost of the countries that form the region known as Scandinavia. Scandinavia also includes Sweden and Norway. Although small in territory and population, Denmark has played a notable role in European history. The capital is Copenhagen.

Geography

A long peninsula known as Jutland makes up most of the country's area. Denmark also includes more than 400 islands to the east of Jutland. Germany lies to the south of the peninsula. The North and Baltic seas surround the rest of Denmark. Narrow passages of water, called straits, separate Denmark from Norway and Sweden. Greenland and the Faroe (or Faeroe) Islands, both located in the North Atlantic Ocean, are self-governing parts of Denmark.



The Faroe Islands of Denmark are home to Atlantic puffins and other sea birds.

The Jutland Peninsula is a lowland region with farmland in the east. The longest river in Denmark, the Gudenå, flows for 98 miles (158 kilometers) through Jutland. The islands have low hills, small lakes, and sandy beaches. Fewer than one quarter of the islands are populated. The climate is generally moist and mild.

Plants and Animals

Much of Denmark was once covered by forests of oak, elm, lime (linden), and beech trees. These original forests were cleared to create farmland, but some areas have been replanted. Wildlife includes deer, hares, and hedgehogs. More than 300 species, or types, of bird live in Denmark. However, though the once-common stork is now rare. Fish are plentiful in Danish waters.

People

Most of the people of Denmark are ethnic Danes. Minority groups include people from Turkey, Iran, and Pakistan. Danish, the official language, is closely related to Norwegian. English is also widely spoken. Most of the people belong to the Lutheran church. About 85 percent of the population lives in cities and towns. Copenhagen is home to about one quarter of the country's people.

Economy

Denmark's economy is based largely on services (for example, banking, education, and health care) and manufacturing. The leading manufactured products are machinery, processed foods, metals, printed material, plastic and rubber goods, and furniture. Tourism is important as well.

Denmark has few natural resources. The soil is the country's most important raw material, as about 60 percent of the land is suitable for farming. Wheat and barley are the main crops, and pigs are the main livestock. Denmark's harbors support a large fishing industry.

History

People have lived in Denmark since prehistoric times. The Danish kingdom dates back to the Viking Age, which lasted from the 800s to the 1000s. The Vikings were Danish, Norwegian, and Swedish warriors who invaded much of Europe. By the 1000s the Danish kingdom had grown to include parts of what



Boats anchor in the harbor at Copenhagen, Denmark.

are now Germany, Sweden, Norway, and England.

In 1397 Denmark united all of Scandinavia, plus Iceland, under its rule. After a series of wars, Sweden left the union in 1523. The union between Denmark and Norway lasted until 1814, when Denmark was forced to turn over Norway to Sweden.

Nazi Germany occupied Denmark during World War II. In 1945 Denmark recognized the independence of Iceland. It granted the Faroe Islands self-government in 1948. Greenland became part of Denmark in 1953. It gained self-government in 1979.

Denmark joined the European Economic Community (now the European Union) in 1973. In 2000, however, the nation voted against adopting the euro—the monetary unit of the European Union—as its currency.

► More to explore

Copenhagen • Greenland • Vikings

Facts About DENMARK



Population
(2008 estimate)
5,494,000

Area
16,640 sq mi
(43,098 sq km)

Capital
Copenhagen

Form of government
Constitutional monarchy

Major urban areas
Greater Copenhagen, Århus, Odense, Ålborg, Esbjerg

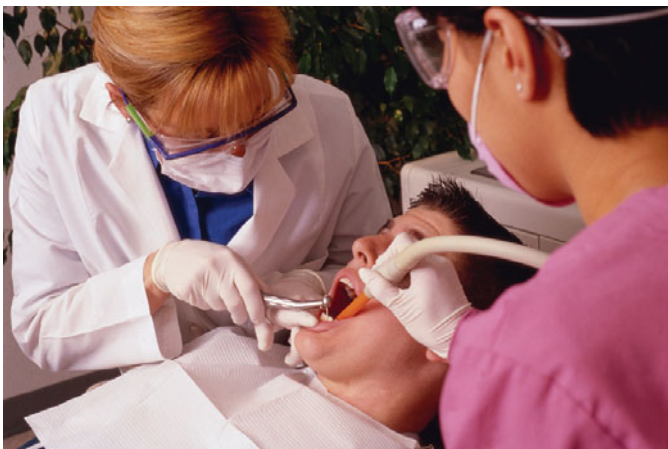
Dentistry

The work of dentists is called dentistry. Dentists are doctors who prevent and treat diseases of the teeth and gums.

Preventing Tooth Decay

Tooth decay is the most common problem with teeth. A sticky film called plaque causes tooth decay. Bacteria in the mouth form plaque as they feed on sugars from food. As acids in the plaque eat away the outer layer of the teeth, decayed areas called cavities form.

Brushing and flossing the teeth can prevent tooth decay. But regular cleanings at a dentist's office are also important. During a cleaning the dentist, or an assistant called a dental hygienist, removes tartar and other material from the teeth. Tartar is a hard, yellowish substance that forms from plaque, minerals, and saliva. The hygienist also polishes the teeth, which helps to prevent plaque from building up again. The hygienist may also treat the teeth with sodium fluoride, a mineral that helps to keep cavities from forming.



A dentist drills a patient's tooth.

Dental Treatments

After a cleaning or on a separate visit, the dentist inspects the teeth and gums for problems. An assistant will often take X-rays, which show cavities or problems inside the teeth or below the gums.

The dentist uses a drill to remove any cavities. Drugs help the patient not to feel pain during the drilling. Then the dentist fills the tooth with a substance made of metals, plastics, or other materials. The substance is commonly called a filling.

Dentists try to avoid pulling teeth. Sometimes, though, dentists must remove teeth that cause pain or other problems. If a patient loses teeth, the dentist may fit the patient with false teeth. Some false teeth are attached to the jawbone. Others, called dentures, may be taken out at night for cleaning.

Dentists may also treat other problems with the teeth, gum disease, and problems with the jaw. Some dentists, called orthodontists, straighten teeth. Cosmetic dentists work to make teeth even and white.

History

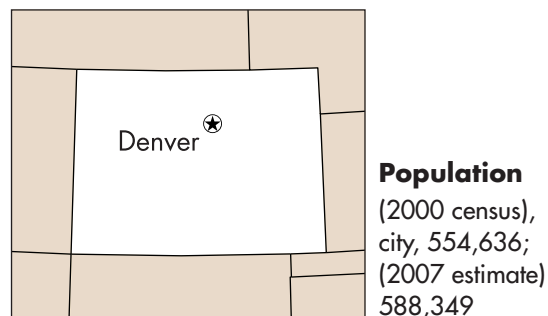
In ancient times people used herbs, mouthwashes, magic spells, and prayers to treat tooth problems. They also pulled out decayed teeth. Dentistry became more scientific in the 1700s. Dentists began using drugs and X-rays in the 1800s. In the 1900s people began adding sodium fluoride to toothpastes

and drinking water to help prevent tooth decay.

► More to explore

Teeth • X-rays

Denver



Denver is the capital of the U.S. state of Colorado. It is a center of transportation, industry, and culture.

Denver is known as the Mile High City. This is because it sits about 1 mile (1.6 kilometers) above sea level. The city lies just east of the Rocky Mountains. Many people visit Denver to ski and hike in the mountains.

Many people in Denver work in tourism, health care, banking, and high-technology industries. Some factories in the city make electronics and equipment for space travel. A U.S. government factory in Denver makes coins.

Denver developed as a mining town. Gold was discovered in Colorado in 1858. People looking for gold settled the site of Denver. It became the capital of the Colorado Territory in 1867. Colorado became a U.S. state in 1876. Denver was then made the state capital.



The Civic Center is a government building in downtown Denver, Colorado. The Rocky Mountains lie to the west of the city.

The people of Denver built their own railroad line in 1870. It connected Denver to a major rail line that crossed the United States. The city grew as a result. In the late 1800s more people moved to Denver. They came to work in the area's silver mines. The city continued to grow greatly during the 1900s.

► More to explore

Colorado • Gold Rush

Desert

When people think of a desert, they usually think of a sandy, hot, and dry place. But there are other types of deserts as well. A desert is any large region that gets very little rain each year. Very few plants or animals live in desert areas.

Features

Deserts cover about 20 percent of Earth's land surface. All the continents



Most deserts get less than 10 inches (25 centimeters) of rain in a year.

have them. Deserts differ greatly in their land features. They may include dunes of shifting sand, mountains, bare rock, and plains of gravel and boulders. Sand dunes are not as common in deserts as many people think. For example, they make up only about 10 percent of the Sahara of northern Africa. Some deserts are not sandy at all.

Types of Deserts

Deserts may be hot or cold. In hot deserts daytime temperatures are often above 100° F (38° C) in summer. The temperature drops sharply at night. The Sahara is the world's largest hot desert. Other hot deserts include the Kalahari in southern Africa and those in the southwestern United States. Most hot deserts are in the region known as the tropics. This is a band of Earth on either side of the equator.

Cold deserts are farther from the equator than hot deserts. Though they are very dry, the main reason they have few plants is that it is so cold there. A cold

desert covers much of Antarctica. The Gobi in Mongolia is another cold desert.

Life in a Desert

Desert plants and animals have features that help them survive in the dry climate. Some plants have special roots that help them absorb the small amount of water that is available. Cacti and yuccas are common desert plants. Desert animals include camels, gazelles, snakes, lizards, and small rodents.

Few people live in deserts. Groups who do include the Tuareg of the Sahara, the San of the Kalahari, the Bedouins of the Middle East and North Africa, and the Aborigines of Australia. Many desert dwellers live in oases. An oasis is a place in the desert with a supply of freshwater.

► More to explore

Cactus • Gobi • Kalahari • Sahara

Des Moines



Population
(2000 census)
198,682;
(2007 estimate)
196,998

Des Moines is the capital of the U.S. state of Iowa. The city lies along the Des Moines and Raccoon rivers.

Des Moines is a center for manufacturing. Factories in the city make tires, farm machinery, and tools. Publishing, insurance, and health care are other impor-



Iowa's Capitol stands on a hill in Des Moines.

tant industries. Many people in Des Moines work for the state government.

Before Des Moines was founded, Sauk and Fox Indians lived in the area. In 1843 the U.S. government built Fort Des Moines at the site. A town soon grew around the fort.

In 1857 the Iowa state capital was moved from Iowa City to Des Moines. The city grew rapidly in the early 1900s. In 1993 the Des Moines and Raccoon rivers overflowed their banks. Much of the city was flooded.

De Soto, Hernando

Hernando de Soto was a Spanish soldier and explorer. He grew rich as a trader and conqueror in Central America and Peru. He died, however, while looking for more treasure in North America.

Hernando de Soto was born in Spain in about 1496. In 1514 he traveled to the West Indies and Central America. He

grew wealthy as a trader of Indian slaves. In 1532 he went to South America. There he helped conquer the wealthy Inca Empire of Peru. De Soto returned to Spain in 1536, rich with Inca treasure.

In 1537 the king of Spain sent De Soto to North America. The king wanted De Soto to conquer the land that is now Florida. He arrived in May 1539 and traveled through what is now the southeastern United States. He treated the Native Americans cruelly, trying to force them to lead him to gold. In response, the Native Americans frequently attacked the Spaniards.



Hernando de Soto

In 1541 De Soto and his men crossed the Mississippi River. They were the first Europeans to see it. De Soto died of disease on May 21, 1542, in what is now Louisiana. His men returned to Spain without gold.

► **More to explore**
Inca • Mississippi River

Dew

At dawn, tiny drops of water often cling to grass and other plants. This moisture is called dew. Dew forms in the night air through a process called condensation.

Air contains water in the form of a gas called water vapor. In the evenings, when warm, moist air passes over cool surfaces, the air cools down. The water vapor in the air begins to condense, or form into small drops. The drops cling to cool surfaces such as leaves, flower petals, and grass. The temperature at which this condensation begins to happen is known as the dew point.

Dew usually forms on clear nights when the air is calm. Dew can form on any surface that is cool and exposed to the sky. It often forms on the ground and on plants because these things usually cool faster than the air. For the same reason, dew often collects on the tops of cars. The time of night when dew begins to form is called dewfall.



Dew often forms on grass during cool nights.

Dew can help plants if they are dry. But damaging fungi may form on plants if dew makes them too wet. Dew that contains pollution is another danger. Pollution can get into dew when the water vapor in polluted air condenses. Like acid rain, this polluted dew, called acid dew, can harm living things.

► More to explore

Rain • Water

Dhaka



Population
(2006
estimate), city,
6,479,751;
urban area,
11,813,728

Dhaka is the capital of Bangladesh, a country of southern Asia. The city lies on the Buriganga River. It is the largest city in Bangladesh. Dhaka is a center of industry, education, and culture.

The old section of Dhaka has many historic buildings. The city has several hundred mosques. The Star Mosque was built in the 1700s. It is decorated with twinkly tiles set in star shapes. Lalh Bagh is an unfinished fort from the 1600s. It includes a mosque, a tomb, and a museum.

Many people in Dhaka work for the government. Banking, education, health care, and construction also bring money



Dhaka, Bangladesh, is one of the world's fastest growing urban centers.

to the city. Factories in Dhaka make fibers and fine cloth. Other factories make rubber, jewelry, furniture, and machinery.

People have lived in Dhaka since at least the 900s. In the 1600s the Mughal emperors of India took over the area. They made Dhaka the capital of a province in India. The city grew wealthy as a center of sea trade. Many palaces and gardens were built. In 1704 the Mughals moved their capital to another city. This hurt Dhaka's economy. Great Britain took control of the city in 1765.

Dhaka became the capital of a province of Pakistan in 1947. In 1971 the province became the independent country of Bangladesh. Dhaka was made the new country's capital.

► More to explore

Bangladesh • Mughal Empire

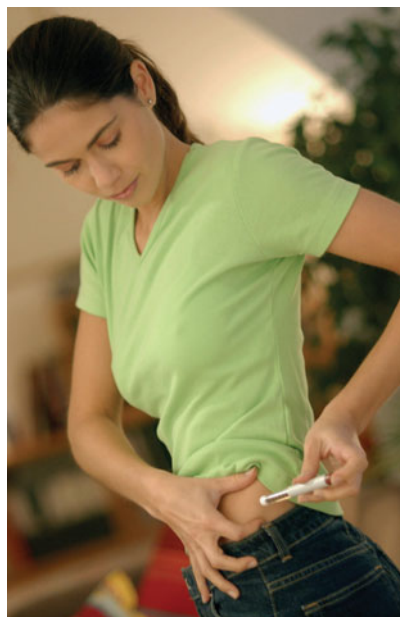
Diabetes

Two different diseases are called diabetes. Diabetes mellitus happens when there is too much glucose in the body. Glucose is a sugar that the body gets from food and uses for energy. Diabetes insipidus is a rare disease that affects the kidneys.

Types of Diabetes

There are two major types of diabetes mellitus. In type I the body stops making insulin or does not make enough. Insulin is a hormone, or chemical, that normally controls the level of glucose in the blood. This type of diabetes often happens in children and teenagers. In type II the body makes insulin but cannot use it properly. Type II usually occurs in adults. It is the most common type of diabetes.

Diabetes insipidus is linked to a hormone called vasopressin. When the body



A woman with diabetes gives herself a shot of insulin.

does not make vasopressin or cannot use it, the kidneys produce too much urine.

Symptoms

Diabetes mellitus and diabetes insipidus have similar symptoms. People with either disease are often very thirsty. They also urinate a lot. The loss of water through urination can cause dry skin and tiredness. Untreated diabetes mellitus can lead to heart disease, kidney problems, blindness, the loss of feet or legs, and death. Untreated diabetes insipidus can lead to low blood pressure and shock.

Did You Know?

Before doctors began to give insulin to people with diabetes mellitus in the 1920s, many people died soon after developing the disease.

Causes

Doctors do not know the exact cause of diabetes mellitus. People who are overweight and do not exercise seem to have an increased risk of developing the disease. Diabetes insipidus may be caused by brain damage, kidney damage, or certain drugs.

Treatment

People with type I diabetes mellitus must have daily shots of insulin. People with type II can usually control the disease with a healthy diet and weight loss. In some cases, however, medication is needed. Doctors treat diabetes insipidus with medications.

► More to explore

Hormone • Kidney

Diana

► see Artemis.

Dias, Bartolomeu



Bartolomeu Dias

Bartolomeu Dias of Portugal was one of the most important European explorers before Christopher Columbus. He led the first European expedition around the southern tip of Africa. This opened the way for sea trade between Europe and Asia.

Bartolomeu Dias (also spelled Bartholomew Diaz) was born in about 1450 near Lisbon, Portugal. In August 1487 Dias took three ships in search of the southern tip of Africa. In January 1488 he passed the tip, but he did not see it. It was very stormy at the time. After he turned around and reached the southern coast of Africa he realized what had happened.

Dias wanted to go on to India, but his crew would go no farther. Upon rounding the tip of Africa again, Dias named it the Cape of Storms because of the weather he had battled on the voyage

out. It was later renamed the Cape of Good Hope. Dias returned to Portugal in December 1488. In 1497 another Portuguese explorer, Vasco da Gama, continued along the same route and reached India.

In 1500 Dias commanded a ship in an expedition led by Pedro Álvares Cabral. Cabral's fleet veered far from Africa and sighted land that turned out to be Brazil. Dias died at the Cape of Good Hope in May 1500, when his ship sank in a storm.

► More to explore

Gama, Vasco da

Dickens, Charles

Charles Dickens was one of the most famous English writers of the 1800s. Although his books are often very funny,



Charles Dickens

they show many of the difficulties of living in his time. His books are still very popular today.

Charles Dickens was born on February 7, 1812, in Portsmouth, England. His family moved to London in 1822. The Dickens family often had money problems. For a while Charles had to leave school to work in a factory. He later wrote about the difficult working conditions he experienced.

Dickens finished school for good at age 15 and went to work. He wrote stories and articles for magazines and newspapers. His first novel, *The Pickwick Papers*, was published in 1837.

He wrote many famous books. *Oliver Twist* (1838) tells the story of an orphan boy in London. *A Christmas Carol* (1843) became one of the most popular Christmas stories of all time. Another novel, called *David Copperfield* (1850), was based partly on Dickens' childhood. In many of his later books, Dickens wrote about social problems that worried him. For example, his book *Hard Times* (1854) is about problems faced by factory workers.

In his later years, Dickens wrote less. He had grown tired. He published *A Tale of Two Cities* in 1859. It is a novel about the French Revolution. *Great Expectations* was published from 1860 to 1861. Dickens died on June 9, 1870.

► More to explore

Book and Bookmaking • Literature

Did You Know?

Most of Dickens' novels were first published as serials. They appeared a few chapters at a time in a magazine.

Dictatorship

A dictatorship is a form of government in which a person or a small group rules with almost unlimited power. The ruler of a dictatorship is called a dictator.

Absolute monarchs (kings) are another type of ruler with unlimited power. But monarchs usually inherit their position. By contrast, dictators take power by force or by misleading the people.

How Dictators Rule

Dictators may come to power in free elections and gradually take over the entire government. Or they may use force to throw out the current ruler. This is called a coup. When an army commander or a group of army officers takes power, it is called a military dictatorship.



General Augusto Pinochet overthrew Chile's president and became dictator in 1973. He ruled with military force.

Once in power, dictators use the police or the army to keep control. They often take away people's freedoms. In addition, many dictators cancel or control elections so that the people cannot vote them out of office.

A special form of dictatorship is totalitarianism. Totalitarian dictators control all parts of society. Schools, businesses, newspapers, and even the arts must follow the government's wishes. Anyone who displeases the dictator may be killed. The worst totalitarian governments of the 1900s were those of Adolf Hitler in Germany and Joseph Stalin in the Soviet Union.

History

The word dictator was first used in the ancient Roman Republic. At that time a dictator was a temporary leader. His great power lasted only during times of trouble. But one Roman leader, Julius Caesar, became dictator for life.

Dictatorships became common during the 1800s and 1900s. In those years many colonies of foreign nations gained their independence. As they did so they either became democracies or dictatorships. Many dictatorships arose in Latin America in the 1800s and in Africa in the late 1900s.

► More to explore

Democracy • Government • Monarchy

Digestive System

Animals need food for energy and growth. To use the food they eat, they

must change it into a form that the body can use. This process is called digestion. The different organs, or body parts, that are involved in this process make up the digestive system.

In humans the main organs of the digestive system are the mouth, the esophagus, the stomach, the small intestine, and the large intestine. The liver and the pancreas also help in the process of digestion.

Mouth

Digestion begins in the mouth, where the teeth chew the food. Glands in the mouth produce a digestive juice called saliva. The tongue mixes the food particles with the saliva. The saliva moistens and softens the food so that it can be swallowed easily. When a person swallows food it passes through the pharynx, or throat, into the esophagus.

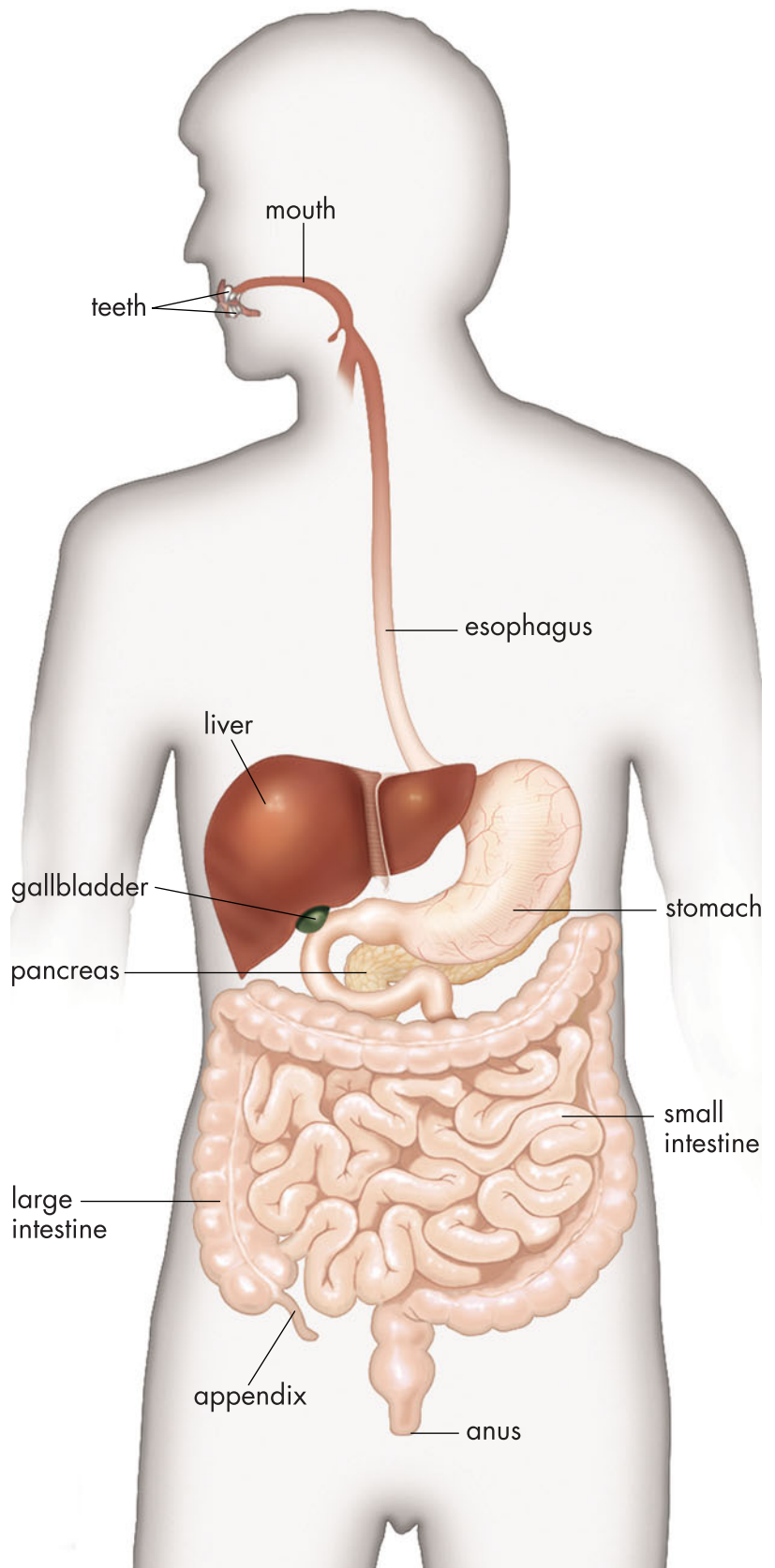
Esophagus

The esophagus is a tube that connects the mouth to the stomach. In a process called peristalsis, the walls of the esophagus move in waves to push the food down the tube to the stomach.

Stomach

In the walls of the stomach, millions of glands produce digestive juices. The juices contain substances called enzymes and hydrochloric acid. These substances help to break down the food particles.

The stomach churns the food into a thick liquid called chyme. This process does not take place all at once. Starch



Many organs are involved in the human digestive system.

Did You Know?

The human digestive system is surprisingly long. If it were stretched out, it would measure five times the length of the human body.

mouth
pharynx
esophagus
stomach

small intestine

large intestine

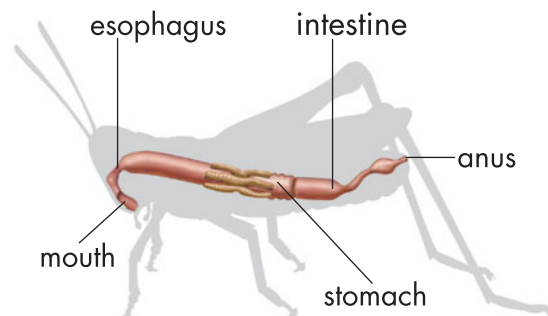
and sugar are easily digested, so they remain in the stomach for only a couple of hours. Proteins remain for three to five hours. Fats may remain in the stomach even longer.

Small Intestine

From the stomach, peristalsis pushes the chyme into the small intestine. The small intestine is the longest part of the digestive system. Food remains in the small intestine for several hours.

Two large glands, the liver and the pancreas, are connected to the small intestine by ducts, or tubes. The glands send digestive juices to the small intestine through these ducts. Juice from the pancreas helps to digest carbohydrates, proteins, and fats. The liver makes bile, which helps to digest fat. Glands in the small intestine also produce digestive fluids.

All these fluids break down most of the remains of the food into simple chemicals. These chemicals enter the bloodstream through the walls of the small intestine. The blood carries the chemicals to the body's cells. The body then uses those chemicals as fuel for energy and growth.

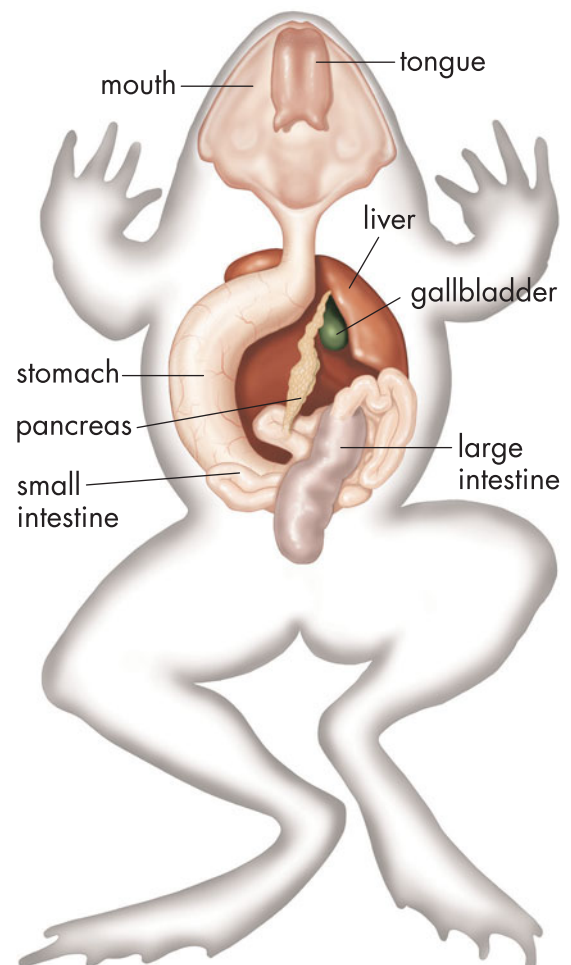


A grasshopper's digestive system is basically a long tube divided into sections.

Large Intestine

Some substances, like plant fibers, cannot be broken down. These substances pass from the small intestine into the large intestine, or colon. The large intestine is much shorter and wider than the small intestine. The waste material slowly moves through the colon over a period of 10 to 20 hours.

The first section of the colon absorbs fluids and salts. The second section removes more water. This process turns the waste material from a liquid to a solid. The last section of the colon is a



A frog's digestive system has many similarities to the human digestive system.

holding area for waste. From there the waste passes out of the body through the anus.

► More to explore

Intestines • Mouth • Stomach

Dike

► see Levee and Dike.

Dili



Population
(2004 estimate)
51,700

Dili is the capital of East Timor, a country in Southeast Asia. East Timor takes up the eastern part of Timor Island. Dili has been its capital for hundreds of years. However, East Timor was not an independent country until 2002.

Dili is East Timor's largest city. It is also the country's main port and center of trade.

People have lived on Timor Island for thousands of years. Portuguese settlers founded Dili in about 1520. It became the capital of Portugal's colony on the island. East Timor declared its independence from Portugal in 1975. However, Indonesia soon captured East Timor.

In 1999 Indonesia began preparing to allow East Timor to become independent. Indonesian groups that opposed this killed hundreds of East Timor's

people. Dili was badly damaged, but it later began to rebuild. In 2002 East Timor became an independent country with Dili as its capital.

► More to explore

East Timor

Dinosaur

Dinosaurs were the main animals on Earth for more than 150 million years. They were lizardlike reptiles. Some of them were the largest and scariest creatures that ever walked on land. The word dinosaur comes from Greek words meaning "terrible lizard."

The last dinosaurs became extinct, or died out, about 65 million years ago. Fossils of dinosaurs were first discovered in the early 1800s. Fossils are remains or impressions of a plant or animal that have been preserved in rock. By studying these fossils, scientists know that dinosaurs were the ancient cousins of today's crocodiles, snakes, and lizards. Scientists also believe that today's birds descended from dinosaurs.

When and Where Dinosaurs Lived

The study of the history and physical features of Earth is called geology. Earth began forming about 4.6 billion years ago. Earth underwent many changes from then until the present. Geologists call this vast time period geologic time. They break geologic time into smaller time periods. Dinosaurs lived from about 215 to 65 million years ago. They

Did You Know?

At least 1,000 types of dinosaur are known. Paleontologists (scientists who study fossils) discover new types almost every year.

were common during the Triassic, Jurassic, and Cretaceous geologic time periods. Not all the species, or types, of dinosaur lived at the same time. They also did not all become extinct at the same time. They died out gradually.

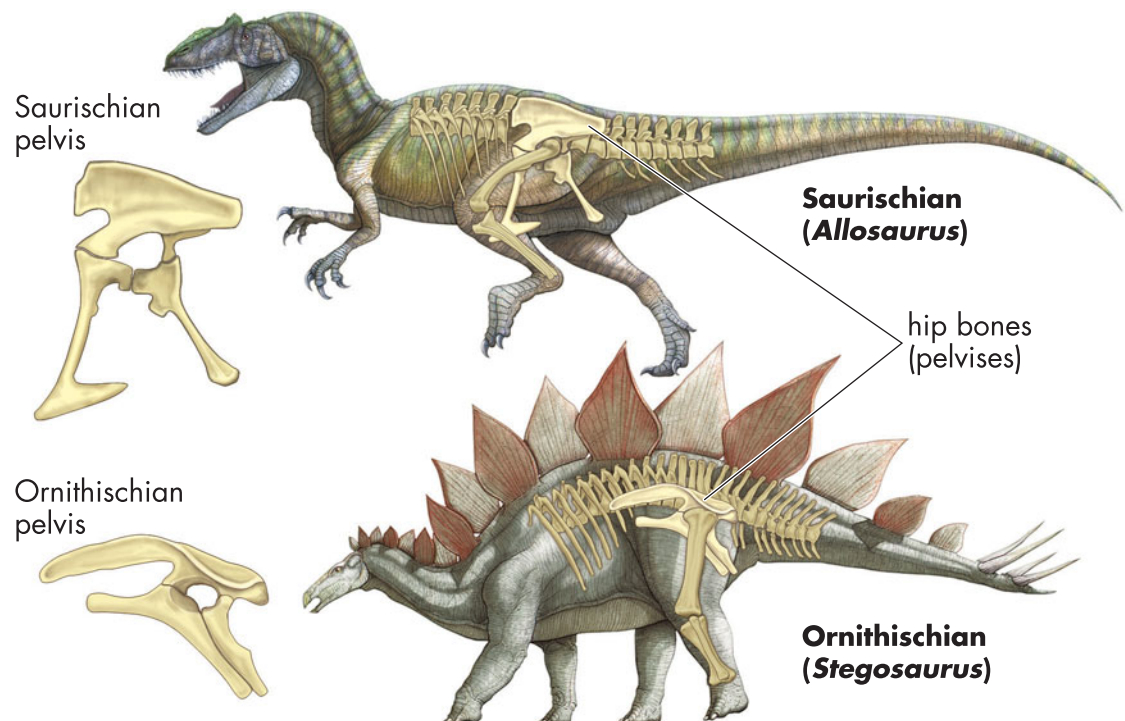
Dinosaurs lived throughout the world, and their fossils have been found on every continent. They lived in all different kinds of environments as well, ranging from tropical forests to dry, sandy deserts.

Physical Features and Behavior

Dinosaurs were all different sizes. Some dinosaurs were smaller than a chicken. Others weighed as much as 100 tons—more than 10 times as much as the largest elephants.

Dinosaurs did not have any hair. Their skin had a bumpy or pebbly surface. Some scientists believe that dinosaurs were gray or green in color. These colors would have helped the dinosaurs blend in with their surroundings. Other scientists think that dinosaurs were very colorful. Bright colors would have helped males get the attention of females.

Scientists have divided dinosaurs into two large groups. The groups are based on the way a dinosaur's hip bones were shaped. One group is the Ornithischia, or bird-hipped dinosaurs. Members of this group are called ornithischians. The other is the Saurischia, or lizard-hipped dinosaurs. Members of this group are called saurischians.



Some dinosaurs had hip bones that resembled those of modern reptiles. Others had hip bones that resembled those of modern birds.

Ornithischian Dinosaurs

The ornithischians had hips shaped like the hips of today's birds. Despite this similarity, however, today's birds are not related to the ornithischians.

The ornithischians were plant eaters. They walked on either two or four thick, sturdy legs. Ornithischians generally had flat teeth to grind tough plants. They also had an extra bone at the tip of the lower jaw. This bone joined the two halves of the lower jaw together. It also helped to form a horny beak that made it easier for the dinosaurs to bite plants.

Many of the ornithischian dinosaurs had special features. Some, such as *Triceratops*, had horns like a modern rhinoceros. *Euoplocephalus* had a huge club at the end of its tail. *Stegosaurus* had large, triangular bony plates sticking out of its back.

Saurischian Dinosaurs

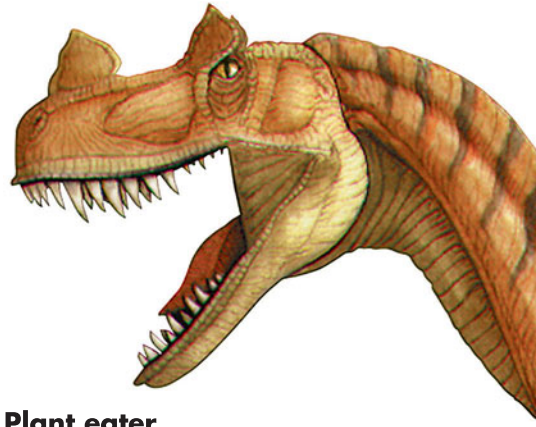
The saurischians had hips that look like the hips of today's reptiles. But they also had some features in common with today's birds. In fact, scientists believe that the saurischians are more closely related to birds than to some other dinosaurs. The earliest bird, *Archaeopteryx*, was a saurischian. The saurischians are divided into the meat-eating theropods and the plant-eating sauropods.

Theropods

The theropods include all the meat-eating dinosaurs. Among them is the fierce *Tyrannosaurus rex*, which weighed as much as 8 tons. *Giganotosaurus* and *Spinosaurus* were even larger. Theropods

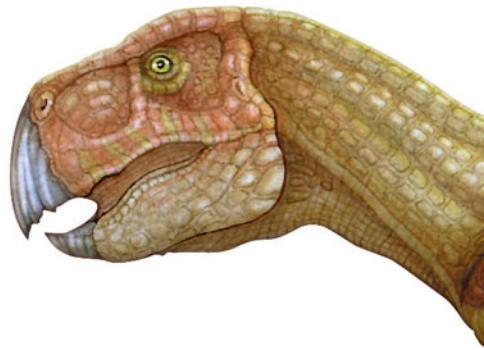
Meat eater

Ceratosaurus had large bladelike teeth for slicing meat.



Plant eater

Psittacosaurus had a large parrotlike beak for tearing off and eating hard plant material.



Plant-eating and meat-eating dinosaurs had different mouth features.

walked on their two back legs. Most of them were built to hunt. They used their short front arms to catch and tear prey. Their fingers and toes had long, sharp claws. They had powerful jaws and sharp teeth for tearing flesh.

Theropods normally hunted alone. They caught and ate smaller, plant-eating dinosaurs. Sometimes they hunted in groups and attacked larger dinosaurs.

Sauropods

Sauropods were not only the largest of all dinosaurs. They were also the largest

land animals that ever lived. Sauropods were plant eaters that walked on four legs. *Brachiosaurus*, *Diplodocus*, and *Apatosaurus* are examples of sauropods.

Sauropods had a very small head and brain when compared to their huge body. But they had a long neck, which let them reach leaves on even the tallest trees. They had thick, strong legs, like those of an elephant. Many sauropods probably could stand up on their back legs to reach even higher into the trees. They used their long, muscular tail to balance themselves when standing. Some sauropods also might have used the tail as a whiplike weapon.

Life Cycle

Most, if not all, dinosaurs laid eggs. Some dinosaurs built large nests to keep their babies together. Young dinosaurs

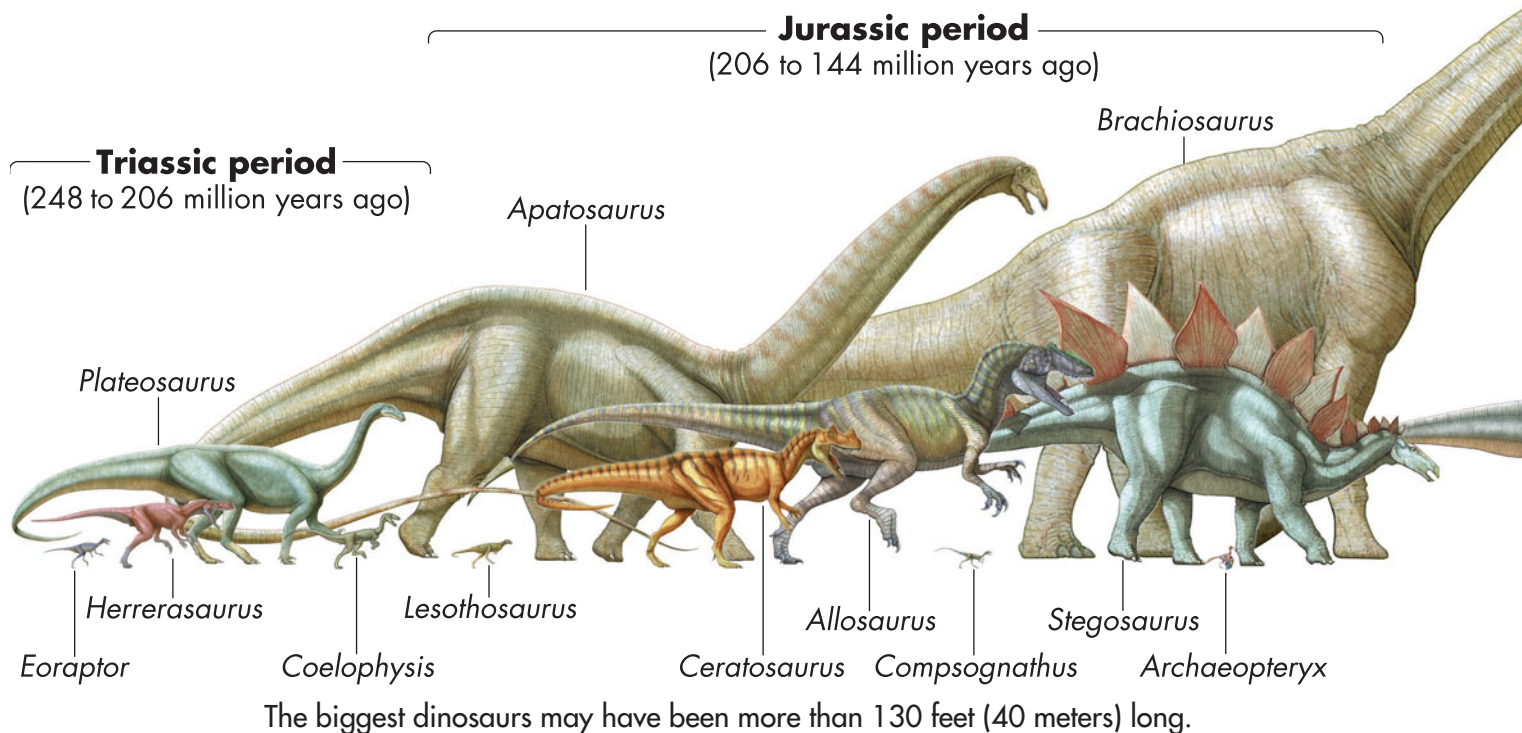


A dinosaur sits on its eggs.

grew very fast. Many reached full size in seven or eight years. Large dinosaurs might have lived almost 100 years.

Extinction

The last dinosaurs died out about 65 million years ago. Scientists still do not agree about why this happened. Some scientists think that dinosaurs died out because the temperature on Earth got too hot or too cold for them. Others



The biggest dinosaurs may have been more than 130 feet (40 meters) long.

believe that a huge asteroid collided with Earth. The collision could have produced dust that blocked the sun's heat and light for months or even years. Plants would have stopped growing, and plant-eating dinosaurs would have died from lack of food. So would have the meat eaters that hunted them.

Some animals lived through the time when the dinosaurs disappeared. The ancestors of today's frogs, turtles, lizards, and snakes found a way to survive. Birds also survived. Scientists do not know why some animals lived but the dinosaurs did not.

► More to explore

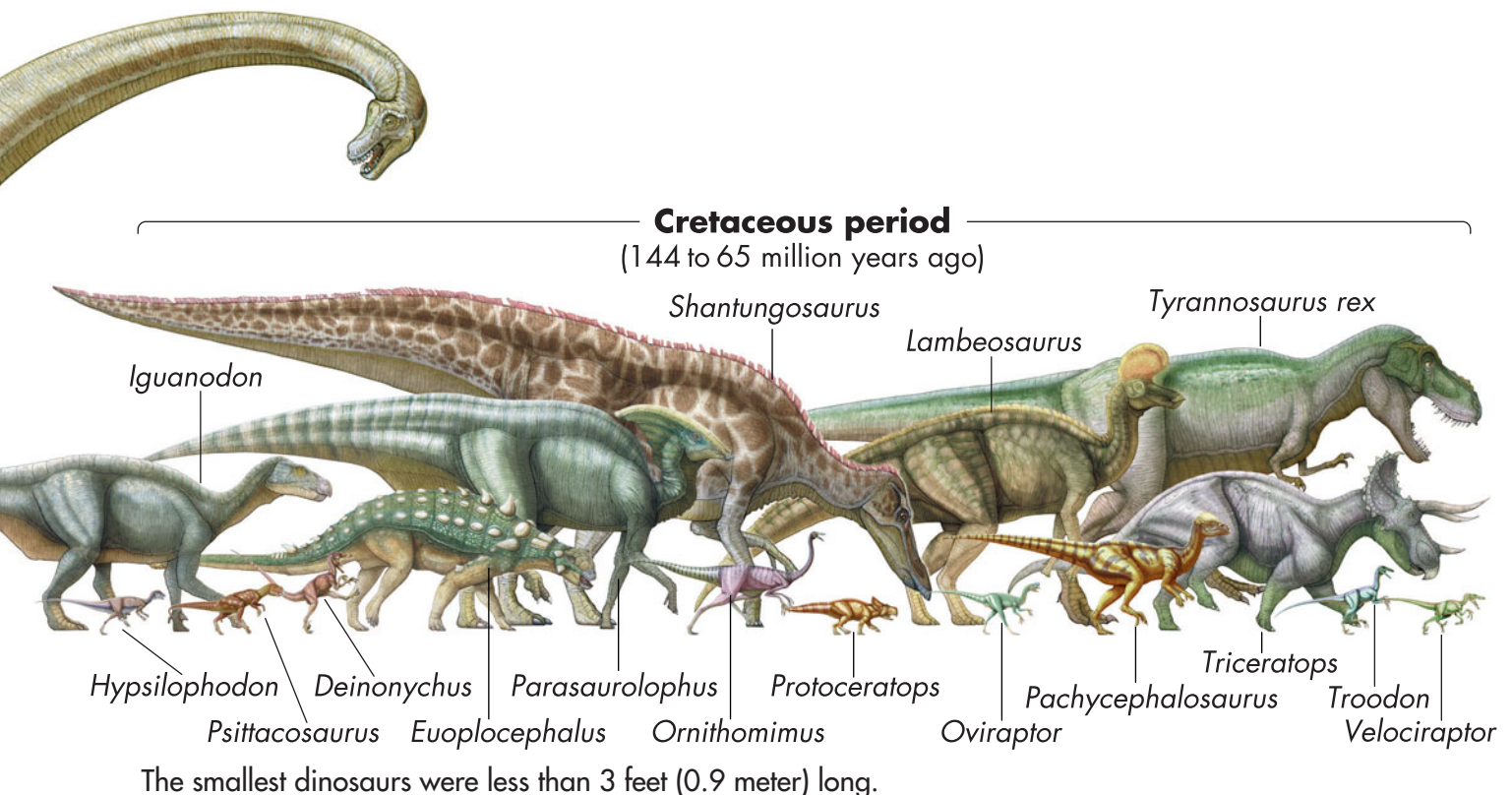
Apatosaurus • Archaeopteryx • Bird
• Brachiosaurus • Euoplocephalus
• Fossil • Geology • Reptile
• Stegosaurus • Triceratops
• Tyrannosaurus Rex

Disability

A disability is a physical or mental problem that makes it difficult or impossible for a person to walk, see, hear, speak, learn, or do other important things. Some disabilities are permanent, or last forever. Others are temporary, or last for only a short time. A disability can be something a person was born with. Or it can be the result of an illness or an accident.

A physical disability is a problem with the body. Physical disabilities may affect the eyes, the ears, the muscles, or the interior organs. Some people with physical disabilities may use wheelchairs to move around.

A mental disability is a problem with the brain, or mind. Mental disabilities





Some children with a physical disability may use a wheelchair to get around.

include developmental disabilities (mental retardation), mental illness, and learning disabilities, such as dyslexia. A person with a mental disability may have trouble learning or getting along with other people.

With medical treatment or other help, people with disabilities can do many of the things that nondisabled people can do. A person with a missing leg can learn to walk with an artificial leg. Many kinds of mental illness can be treated with medication or other therapies. Organizations in a community can help people with developmental disabilities go to school, work, or live on their own.

► **More to explore**
Special Olympics

Discrimination

Discrimination is unfair treatment of one particular person or group of people. Usually the different treatment is because

of the person's sex, religion, race, age, nationality, or other personal traits.

Discrimination prevents people from doing things that other people can do freely. It can happen in many ways and in many areas of life. It can happen at work, in public, and at school. For example, if a student is not allowed to go to a school because of his or her race, the school is discriminating against that student.

Sometimes even governments have discriminated against whole groups of citizens. A government may pass laws that make it harder for certain groups of people to vote, to go to school, to travel freely, or to do other things. For example, South Africa had a system of discrimination against the non-white people of the country for many years. The system was called apartheid.

Discrimination happens throughout the world. It is worse in some countries than in others. In the United States many



In South Africa, during the period called apartheid, blacks were not allowed to use the same beaches as whites. Such a rule is a form of discrimination.

people have worked to end discrimination. One of the most important laws passed to end discrimination was the Civil Rights Act of 1964. This law protects people from discrimination based on race and skin color, the country a person comes from, sex, and religion. The U.S. government has also tried to stop other forms of discrimination. These include treating people differently because of their age or because they have a disability.

► More to explore

Apartheid • Civil Rights Movement

Disease, Animal

Animals other than humans can suffer from diseases, or illnesses, just as humans do. People worry mainly about the diseases that affect animals used for food, the diseases that affect pets, and the diseases that can be spread from animals to people.

Like human diseases, animal diseases may be divided into two groups: infectious diseases and noninfectious diseases. Animal doctors, called veterinarians, can treat many of these diseases.

Infectious Diseases

Infectious diseases can spread from one animal to another. These diseases are caused by germs called viruses and tiny living things—bacteria, protozoans, fungi, and worms.

One of the most feared animal diseases is rabies. Rabies attacks the brain. A virus found in the saliva of animals with

rabies causes the disease. Rabies most often spreads through bites. People can catch rabies, too. However, a vaccine can protect people as well as animals from rabies.

Another virus causes Newcastle disease, which affects chickens, turkeys, and pet birds. The symptoms are like those of influenza, or flu. People can catch this disease from sick birds.

Tuberculosis, a disease caused by bacteria, affects cattle. The disease harms the lungs. Tuberculosis can be spread to people through cow's milk. Because of this, milk is often heated in a process called pasteurization. This kills the bacteria before they can infect a person.

Mad cow disease is caused by a particle, or tiny piece, of protein called a prion. Mad cow disease affects the brains of cattle. Farmers kill cattle that are sick with mad cow disease to keep the disease from spreading. People can catch mad cow disease by eating meat from sick cattle.



A veterinarian looks at a bulldog. Veterinarians can treat many animal diseases.

Heartworm is a serious disease of cats and dogs. A worm that infects the heart causes the disease. Medicines can prevent and treat heartworm.

Noninfectious Diseases

Noninfectious diseases cannot be spread from one animal to another. Many of these diseases are similar to noninfectious diseases in humans. Cancer affects many older dogs, cats, and other animals. Pets and many wild animals can suffer from arteriosclerosis. This is a disease in which the blood vessels become blocked. Many animals can also develop cloudy growths, called cataracts, over their eyes.

► More to explore

Animal • Disease, Human • Vaccine

Disease, Human

Diseases, also called illnesses or sicknesses, are conditions that make people unhealthy. Human diseases fall into two major groups: infectious diseases and noninfectious diseases.

Infectious Diseases

Infectious diseases are contagious, or catching. People may catch these diseases in a number of ways. Direct contact between humans spreads some infectious diseases. Animals, such as mosquitoes, spread others. Still others spread through air, water, or food.

Tiny living things called pathogens, or germs, cause infectious diseases. Once a pathogen has entered the body, the person is said to be infected. Pathogens include viruses, bacteria, fungi, and protozoans.

Some diseases caused by viruses are the common cold, influenza (the flu), chicken pox, measles, and AIDS. Diseases caused by bacteria include strep throat, tuberculosis, and Lyme disease. Fungi cause some skin diseases—for example, athlete’s foot and ringworm. Different protozoans cause malaria and sleeping sickness.

Doctors can often cure diseases caused by bacteria with drugs called antibiotics. Various medicines can treat diseases

To learn more about human diseases and disorders, turn to these articles:		
AIDS	Food Poisoning	Pneumonia
Alzheimer’s Disease	Hepatitis	Polio
Arthritis	Influenza	Reye’s Syndrome
Asthma	Lyme Disease	Rubella
Cancer	Malaria	Scarlet Fever
Cerebral Palsy	Measles	Smallpox
Chicken Pox	Meningitis	Strep Throat
Cholera	Mental Illness	Tonsillitis
Cold, Common	Mononucleosis	Tuberculosis
Diabetes	Mumps	West Nile Virus
Down Syndrome	Parkinson’s Disease	Yellow Fever
Epilepsy	Plague	

caused by viruses, fungi, and protozoans. Doctors also use vaccines to prevent people from catching many infectious diseases, especially those caused by bacteria and viruses.

Noninfectious Diseases

Many human diseases do not result from pathogens. These diseases are called noninfectious. They are not contagious.

Some noninfectious diseases are inherited, or passed down through families. They happen when there is a problem with one or more genes. (Genes are tiny units of information inside a person's cells.) Sickle cell anemia is a common inherited disease. It affects the shape of blood cells.

A person's lifestyle can lead to certain noninfectious diseases. People who eat poorly and do not exercise are in danger of getting heart disease or diabetes. People who smoke cigarettes are more likely to get lung cancer than non-smokers.

Environmental dangers or pollution can also cause noninfectious diseases. People who live close to polluting factories or toxic waste dumps may get cancer or other diseases.

Doctors do not know the exact causes of many noninfectious diseases. Alzheimer's disease and multiple sclerosis are two diseases whose causes are unknown.

Drugs, surgery, and other treatments can help to control some noninfectious diseases. But many of these diseases cannot

be cured. Scientists today are researching ways to cure inherited and other noninfectious diseases.

► More to explore

Bacteria • Genetics • Medicine • Virus

Disney, Walt

Walt Disney was a pioneer in the field of animated, or cartoon, films. He is best known for creating such characters as Mickey Mouse and Donald Duck.

Walter Elias Disney was born on December 5, 1901, in Chicago, Illinois. At an early age Walt had a gift for drawing and painting. While attending high school he took art classes to develop these skills. Disney left school to serve as an ambulance driver during World War I.



Walt Disney stands by a picture of Mickey Mouse. Mickey Mouse starred in more than 100 short cartoons.

Did You Know?

For many years Walt Disney himself was the voice of Mickey Mouse.

In 1923 Disney moved to Hollywood, California. There he began creating the characters that would make him famous. In 1928 he released the short cartoon film *Steamboat Willie*. It starred a cheerful mouse named Mickey. The next year Disney formed Walt Disney Productions to create more animated films.

Other popular cartoon characters followed. In the 1930s audiences were introduced to Minnie Mouse, Donald Duck, and Goofy. Disney's first full-length animated film, *Snow White and the Seven Dwarfs*, was released in 1937.

In the 1940s Disney's company began making movies with live actors. *Mary Poppins*, from 1964, was the most successful of these. Disney also continued making animated features, including such classics as *Pinocchio* (1940), *Cinderella* (1950), and *Peter Pan* (1953).

In 1955 Disney's company opened Disneyland, a large theme park in Anaheim, California. Walt Disney World, a second and larger amusement park, opened in Orlando, Florida, in 1971. Disney died on December 15, 1966.

► More to explore

Animation • Cartoon • Movie

Diwali

The Hindu religious holiday called Diwali (or Divali) celebrates the new year. Diwali is a major holiday in India, but it is celebrated by people living outside of India as well. The name Diwali



An Indian boy lights a lamp during Diwali. Sometimes people float the lamps on rivers.

comes from a Sanskrit word that means “row of lights.” The holiday is often called the Festival of Lights. During Diwali small lamps filled with oil light up houses and temples. The lights are meant to welcome the goddess of wealth. The festivities last for five days. The fourth day marks the start of the new year on the Hindu calendar. On the calendar used by most of the world, Diwali falls in late October or early November.

Diwali is one of the major religious holidays of Hinduism. People often visit friends and family during Diwali. They give each other gifts and eat their favorite foods, especially sweets. Merchants perform religious ceremonies and open new account books in the hope of gaining wealth.

► More to explore

Hinduism

Djibouti

The small Republic of Djibouti shares the Horn of Africa—a triangle of land on Africa's east coast—with Eritrea, Ethiopia, and Somalia. Its capital is the port city of Djibouti.

Geography

Djibouti sits between the Red Sea and the Gulf of Aden. The gulf is a part of the Indian Ocean. The climate is hot year-round, and it rarely rains. Much of the land is bare desert. Dry riverbeds and salty lakes dot the interior. Mountains rise in the north.

Plants and Animals

Djibouti's few plants include thorny shrubs and grasses. A small forest of olive, juniper, and acacia trees grows around Mount Mousa, the country's highest point. Millions of flamingos spend the winter around the salty Lake Assal. Other animals include hyenas, jackals, ostriches, antelope, and gazelles.



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People

The country's two largest ethnic groups are the Issas and the Afars. The Issas are related to the Somalis of Somalia. The Afars are of Arabian origin. Nearly all the people are Muslims. The official languages are French and Arabic, but many people speak Somali or Afar. Most people live in or near Djibouti city.

Economy

Djibouti's economy depends on transportation services. Its port is a supply station for ships traveling through the Red Sea. A railway connects Djibouti to Ethiopia. In rural areas people raise goats and sheep.

History

Hundreds of years ago the region of Djibouti was part of a Christian Ethiopian empire. Arab traders brought Islam to the area in about the AD 800s. Muslims ruled the region until the 1800s, when France took control. The colony of French Somaliland became the French Territory of the Afars and Issas in 1967. The territory gained independence as Djibouti in 1977.

In the 1990s Afar rebels fought the Issa-dominated government. In the early 21st century warfare and drought in neighboring countries forced thousands of people to move to Djibouti.

► **More to explore**
Djibouti City • Red Sea



Facts About DJIBOUTI



Population
(2008 estimate)
506,000

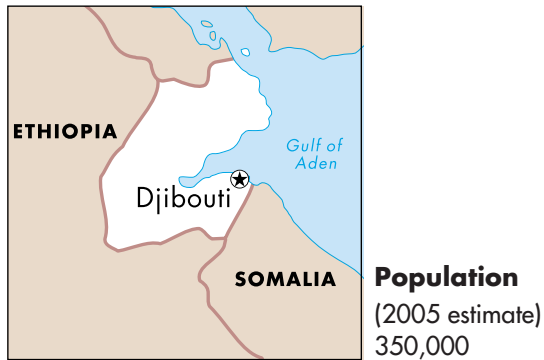
Area
8,950 sq mi
(23,200 sq km)

Capital
Djibouti

Form of government
Republic

Major cities
Djibouti, 'Ali Sabih, Tadjoura, Dikhil

Djibouti



Djibouti is a city in northeastern Africa on the Gulf of Aden, a part of the Indian Ocean. Djibouti is the capital of a small country that is also named Djibouti. Most of the country's people live in Djibouti city.

Djibouti city has a mixture of old and modern buildings in African and French styles. The economy of the city depends on trade through its port. Transporting goods on a railway to Addis Ababa, Ethiopia, also brings money to the city.

Djibouti city began as a port in about 1888. In that year the French built a station for fueling ships in the harbor. A city soon rose up. The colony called French Somaliland grew around the city. In 1892 Djibouti city became the capital of the colony.

Djibouti became an independent country in 1977. Djibouti city was its capital. The city grew rapidly in the late 20th century. Many people went there to escape droughts and wars in nearby countries.

► **More to explore**
Djibouti

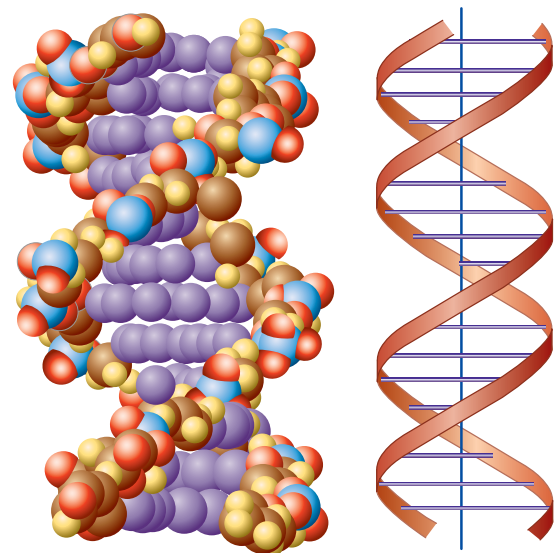
DNA

DNA is the material that carries all the information about how a living thing will look and function. For instance, DNA in humans determines such things as what color the eyes are and how the lungs work. Each piece of information is carried on a different section of the DNA. These sections are called genes.

DNA is short for deoxyribonucleic acid. It is in every cell of every living thing. DNA is found in structures of the cell called chromosomes. Chromosomes are tiny. Scientists need to use very powerful microscopes to see them.

Functions

When DNA works correctly, it helps keep the body working properly. DNA helps cells to make the substances called proteins, which the cells need to live. DNA also allows living things to reproduce. The genes in DNA pass along traits from parents to children.



Part of a long DNA chain shows the twisted, ladderlike structure.

Sometimes there are mistakes in DNA. These mistakes are called mutations. They can cause unusual features, diseases, and other problems.

Structure

DNA has a complex structure. It is made of chemical substances that are linked together like a chain. Each piece of DNA has two long strands, or chains. The two strands are joined together. They form a shape like a ladder that has been twisted into a spiral.

Chemicals called phosphates and sugars make up the sides of the ladder. DNA also has chemicals called bases. Each base on one strand is joined to a base on the other strand. The linked bases form the rungs of the ladder.

Genetic Code

There are four different bases in DNA: adenine, thymine, guanine, and cytosine. These four chemicals are repeated in different orders over and over again in each strand of DNA. Human DNA contains about 3 billion pairs of these bases.

The order in which the bases are arranged is very important. It forms a code that tells cells to make certain kinds of proteins. The differences in these proteins is what makes different living things—such as a cactus, a gerbil, and two different people—different.

► More to explore

Cell • Chromosome • Genetics • Living Thing • Mutation

Dog

The dog is one of the most popular animals in the world. It was one of the first animals to be domesticated, or trained for use by humans. The dog's scientific name is *Canis familiaris*. It is related to the coyote, wolves, foxes, and jackals.

Where Dogs Live

People around the world keep dogs as pets, guards, or work animals. Some dogs, called feral dogs, do not live with people. These homeless dogs often roam around in groups, called packs. One type of dog, called the dingo, lives in the wild in Australia.

Physical Features and Breeds

The dog is a mammal with sharp teeth, an excellent sense of smell, and a fine sense of hearing. Each of its four legs ends in a foot, or paw, with five toes. Each toe has a soft pad and a claw. A coat of hair keeps the dog warm. It cools off by panting and hanging its tongue out of its mouth.



Some dogs are purebred. This means that both parents were of the same breed. A dog with parents of different breeds is called a mutt or mongrel.

Some Breeds of Dog			
	Breed	Origin	Height of Males (inches)
<i>Sporting dogs</i>			
	English cocker spaniel	England	16–17
	Golden retriever	Scotland	23–24
	Irish setter	Ireland	27
	Weimaraner	Germany	25–27
Golden retriever			
<i>Hounds</i>			
	Afghan hound	Afghanistan	27
	Beagle	England	13 or 15
	Dachshund	Germany	7–10
	Greyhound	Egypt	27–30
Beagle			
<i>Working dogs</i>			
	Great Dane	Germany	minimum 30
	Mastiff	England	minimum 30
	Saint Bernard	Switzerland	minimum 27.5
	Siberian husky	northeastern Asia	21–23.5
Siberian husky			
<i>Terriers</i>			
	Bull terrier	England	21–22
	Miniature schnauzer	Germany	12–14
	Scottish terrier	Scotland	10
	Welsh terrier	Wales	15–15.5
Scottish terrier			
<i>Toys</i>			
	Chihuahua	Mexico	5
	Maltese	Malta	5
	Pomeranian	Iceland, Lapland	maximum 11
	Pug	China	10–11
Pug			
<i>Non-sporting dogs</i>			
	Bulldog	England	12–14
	Dalmatian	Croatia	19–23
	Lhasa apso	Tibet	10–11
	Poodle	France	minimum 15
Dalmatian			
<i>Herding dogs</i>			
	Collie	Scotland	24–26
	German shepherd	Germany	24–26
	Old English sheepdog	England	minimum 22
	Pembroke Welsh corgi	Wales	10–12
Collie			

Dog breeds are placed in seven different groups, according to the original function of the breed. For example, sporting dogs and hounds hunt animals. Working dogs do such jobs as pulling sleds or guarding homes. The table shows some dog breeds in each group.

Apart from these common features, dogs come in many different sizes, shapes, and colors. Dogs that have similar sizes, looks, and behaviors make up groups called breeds.

Behavior

Dogs are carnivores, which means that they eat meat. Pet dogs eat dog food made with meat products. Wild dogs hunt animals.

Dogs claim territory and mark it as their own. They do this by urinating and rubbing their scent on things. But dogs also like to be around people and other dogs. People can even train dogs to obey simple commands.

Dogs make many sounds, including barks, howls, and growls. They also use movements to communicate. For example, when a dog wags its tail, it is happy. If it shows its teeth and growls, it is making a threat.

Life Cycle

A female dog gives birth to a litter of puppies about two months after mating. A litter contains two to 12 puppies. Newborn puppies depend on their mother for her milk and protection. Puppies become more independent when they are three or four months old. Dogs live for 10 to 15 years.

Dogs and Humans

Dogs have been with humans since prehistoric times. The ancient Egyptians thought dogs were holy. The ancient Romans kept watchdogs. In the palaces

of ancient China, people kept small dogs in the sleeves of their robes.

Over the years, people developed different breeds of dog for different purposes. Toy dogs, including the poodle and the pug, were meant to be pets. Other dogs were meant to do certain jobs. For example, the golden retriever and other sporting dogs helped people to hunt birds. Some of these dogs are now mainly pets. Others still do their traditional jobs.

Working dogs do many other jobs today. Some sniff bags in search of explosives or drugs. Others track missing people. Guide dogs help blind people get around.

► More to explore

Coyote • Fox • Jackal • Mammal • Pet
• Wolf

Doha



Population
(2004 estimate)
339,800

Doha is the capital of the Middle Eastern country of Qatar. The city lies along a bay of the Persian Gulf. Doha is Qatar's major port and center of business.

People have lived in the Doha area for thousands of years. Doha developed as a



Traditional Qatari ships sail past a modern hotel in Doha.

small fishing village. For many years it was a base for pirates who sailed in the Persian Gulf. Doha was destroyed in 1867 during a war, but it was rebuilt.

Great Britain took charge of Qatar's foreign affairs in 1916. Oil was discovered in the region in the 1930s. Qatar used some of its oil wealth to make Doha more modern. In 1971 Qatar became an independent country. Doha became its capital.

► More to explore

Qatar

Dolphin

Dolphins look like big fishes, but they are actually mammals. They belong to a large group of animals called whales. Dolphins are closely related to porpoises. Because dolphins and porpoises look so much alike, people often confuse the two. However, dolphins are usually larger and have longer, beaklike snouts.

There are more than 35 species, or types, of dolphin. They are divided into

two groups: true dolphins and river dolphins. True dolphins live throughout the world in either salt water or freshwater. The most widespread species are the common dolphin and the bottlenose dolphin. River dolphins live in freshwater in South America and Asia.

Most dolphins are 7 to 10 feet (2 to 3 meters) long, but some species can reach a length of 13 feet (4 meters). Dolphins have smooth, rubbery skin. They have a flipper on each side and a fin on the back. A dolphin must come up to the water's surface to get air. It breathes through a single nostril, called a blowhole, on the top of its head.

Dolphins are known for being intelligent and playful. They live together in groups, called schools. They use sounds to communicate.

Female dolphins give birth to one baby, or calf, at a time. Some types of dolphin may live for 30 years.



Although dolphins look like fish and live in the water, they are actually mammals.

► More to explore

Fish • Mammal • Porpoise • Whale

Dominica

The Commonwealth of Dominica is a small island republic in the Caribbean Sea. Christopher Columbus named the island after the Latin phrase *dies dominica*, which means “the Lord’s day.” Columbus had first spotted the island on a Sunday. Dominica’s capital and largest city is Roseau.

Geography

Dominica lies between the French islands of Guadeloupe and Martinique. It is about 29 miles (47 kilometers) long and less than 16 miles (26 kilometers) wide. A forest-covered mountain range runs from north to south. Dominica has a hot climate with dry and rainy seasons.

Plants and Animals

The Dominican jungle may be the last original rain forest in the Caribbean. It is filled with iguanas, boa constrictors, rabbit-sized rodents called agoutis, and large frogs called crapauds. Imperial

parrots and red-necked parrots live only in Dominica.

People

Most Dominicans are descended from Africans. There are also small groups of whites, Asians, and Caribs (American Indians). English is the official language, but a form of French is commonly spoken. Most Dominicans are Roman Catholics. Almost three fourths of the population lives in cities.

Economy

Dominica is one of the poorest Caribbean countries. Its economy depends on farming, and hurricanes sometimes destroy the crops. Bananas are the main crop. Other crops include root vegetables, citrus fruit, and coconuts. Manufacturers produce mainly soap, toothpaste, and coconut oil. Dominica’s main mineral resource is pumice, a type of volcanic rock.

History

In 1493 Columbus arrived at Dominica, which was inhabited by Caribs. The French set up a colony there in the 1630s. Settlers later brought Africans to work on plantations as slaves. Great Britain won control in 1783. In 1978 the island became independent. Since then Dominica’s leaders have worked to improve the economy.

► **More to explore**
Caribbean Sea • Roseau



Facts About DOMINICA



Population
(2008 estimate)
72,500

Area
290 sq mi (750 sq km)

Capital
Roseau

Form of government
Republic

Major towns
Roseau, Portsmouth, Marigot, Atkinson, Mahaut



Dominican Republic

The Dominican Republic is located on the island of Hispaniola in the Caribbean Sea. The people are known for their merengue dance and their passion for baseball. The capital is Santo Domingo.

Geography

Hispaniola lies between the islands of Cuba and Puerto Rico. The Dominican Republic occupies the eastern two thirds of Hispaniola. Haiti occupies the western third. The island has fertile valleys, desertlike areas, and four mountain ranges. Duarte Peak, at 10,417 feet (3,175 meters), is the highest mountain in the West Indies. The country has a tropical climate with warm temperatures year-round.

Royal palm trees grow throughout the Dominican Republic. Rain forests occur in the wetter areas. The country's wildlife includes alligators and many birds.

People

Most Dominicans have mixed European and African roots. Spanish is the main language. The majority of the population is Roman Catholic. Most people live in cities and towns.

Economy

Services—including tourism and telecommunications—are the main economic activities. Manufacturers make cement, sugar, beer, clothing, and cigars. Farmers grow sugarcane, rice, bananas, cocoa, and coffee. The country also has deposits of nickel and gold.

History

Christopher Columbus discovered Hispaniola in 1492. In 1496 the Spanish founded Santo Domingo. Within decades most of the native Carib and Taino peoples had died. The Spanish brought in slaves from Africa.

France gained control of Hispaniola in 1795. Haiti won independence from France in 1804. Spain took back control of eastern Hispaniola, but the Dominicans declared independence in 1821. Soon afterward the Haitians invaded.

The Dominican Republic achieved independence from Haiti in 1844. It then alternated between weak democracies and governments led by dictators.

► **More to explore**
Haiti • Santo Domingo

Facts About DOMINICAN REPUBLIC



Population
(2008 estimate)
9,507,000

Area
18,792 sq mi
(48,671 sq km)

Capital
Santo Domingo

**Form of
government**
Republic

**Major urban
centers**
Santo Domingo,
Santiago, La
Romana, San
Francisco de
Macorís, San
Cristóbal



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Donkey



A farmer leads a donkey and cart across a plowed field.

The donkey is a member of the horse family. The words donkey and ass are used to identify the same animal. However, the term donkey is used for domesticated, or tamed, animals. The term ass is more often used when the animal is wild. Donkeys are descendants of the African wild ass. They were first domesticated by humans in Africa. They are now used around the world as working animals.

The average donkey stands 40 inches (102 centimeters) at the shoulder, but different breeds vary greatly in size and shape. Donkeys range from white to gray or black in color. They usually have a dark stripe from the mane to the tail and a crosswise stripe on the shoulders. The mane is short and upright, and the tail has long hair only at the end. The ears are very long and are dark at the base and tip. A donkey can carry heavy loads over rough land. The donkey can handle the uneven ground of the mountains better than a horse can.

On average female donkeys give birth 12 months after mating. Donkeys sometimes breed with horses to produce animals called mules. Donkeys can live up to 50 years.

► More to explore

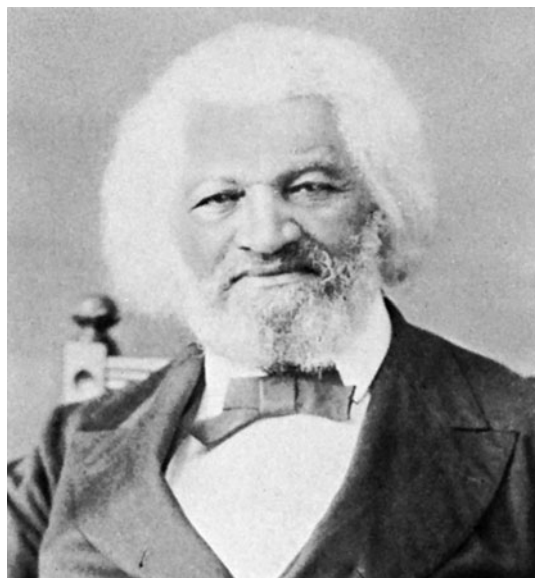
Horse

Douglass, Frederick

His brilliant speaking and writing made Frederick Douglass a leader of the movement to abolish slavery. A former slave himself, Douglass was also the first African American citizen to hold an important position in the U.S. government.

Early Life

Frederick Augustus Washington Bailey was born sometime in 1817 or 1818 in Talbot County, Maryland. His mother was a slave. He never knew his father, who was a white man.



Frederick Douglass

At the age of 8, Frederick was sent to live in Baltimore as a house servant with the family of Hugh Auld. Auld's wife, Sophia, taught Frederick to read.

In 1838 Frederick escaped to New York City, where he lived as a free man. He married Anna Murray of Baltimore, a free woman. They settled in New Bedford, Massachusetts, and Frederick changed his last name to Douglass.

Did You Know?

During the American Civil War Douglass organized two black Army units. He also tried to get equal pay for black soldiers.

Antislavery Work

At an antislavery convention in 1841 in Nantucket, Massachusetts, Douglass was invited to describe his experiences as a slave. His moving speech marked the beginning of his career as an abolitionist.

Douglass was so impressive as a speaker that some of his critics doubted that he could ever have been a slave. Douglass addressed these critics in 1845 by publishing his autobiography, *The Narrative of the Life of Frederick Douglass, an American Slave*.

In 1847 Douglass founded an antislavery newspaper in Rochester, New York, called *The North Star*. While in Rochester, Douglass helped to smuggle escaped slaves to Canada via the Underground Railroad.

Later Life

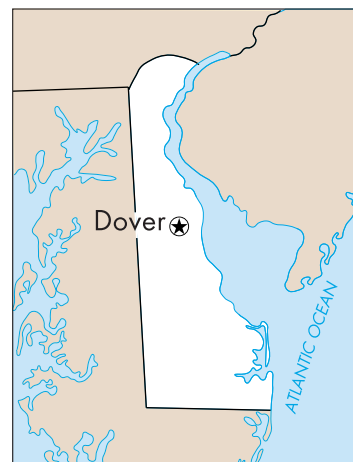
During the American Civil War Douglass was a consultant to President Abraham Lincoln. Douglass suggested that former slaves should be given weapons to fight for the North.

After the Civil War, Douglass held several government offices. He also continued to fight for human rights until he died in Washington, D.C., on February 20, 1895.

► More to explore

Abolitionist Movement • Slavery
• Underground Railroad

Dover



Population
(2000 census)
32,135; (2007
estimate)
35,811

Dover is the capital of the U.S. state of Delaware. The city is located on the Saint Jones River.

Dover is a farm trade center. Crops are brought to the city from nearby farms



One of the important state government buildings in Dover is Legislative Hall.

and are shipped out from there. Factories in the city package foods and make paints, rubber products, and perfumes. Many people in Dover work for the state government.

In 1682 William Penn took control of the colony of Delaware. A year later he ordered a new town to be created. The town was not actually built until 1717. It was named after Dover, England. Dover replaced the city of New Castle as the capital of Delaware in 1777.

► More to explore

Delaware • Penn, William

Down Syndrome

Down syndrome is a disorder, or unusual condition, that can cause delays in a child's development. About 1 in 800 babies is born with Down syndrome. Down syndrome happens when an infant's cells have 47 instead of 46 chromosomes. (Chromosomes are tiny structures in a cell that carry information about people, such as what color eyes and hair they will have.)

Having an extra chromosome can cause developmental disabilities. This means that people with Down syndrome may have trouble learning or taking care of themselves. They may have certain medical problems, too. Some of the most common problems are heart defects and problems with hearing, vision, digestion, and the thyroid gland. Most people with Down syndrome get special medical care from the time they are babies.



A girl with Down syndrome plays the guitar.

In the past many children with Down syndrome lived in special homes apart from their families. Today most people with Down syndrome grow up in their parents' homes. They make friends, go to school, and play sports. As adults many people with Down syndrome have jobs. They often live in group homes or apartments.

► More to explore

Child Development • Chromosome
• Disability

Dragon

► see Animals, Legendary.

Dragonfly

Dragonflies are flying insects with two pairs of see-through wings, huge eyes, and long bodies. Dragonflies live near lakes, streams, and ponds throughout most of the world. There are about 2,500 species, or types, of dragonfly.



A brightly colored dragonfly pauses for a rest.

The insects vary greatly in color. They also range widely in size. The smallest dragonflies have wingspans about 0.8 inch (20 millimeters) across. The largest ones have wingspans about 6 inches (15 centimeters) across. Dragonflies' wings stand out sideways from their bodies even when they are resting.

Adult dragonflies feed mostly on other insects, and their bodies make them deadly hunters. Dragonflies fly faster than most other insects. They can also instantly change the direction of their flight and hover like tiny helicopters. Their large eyes allow them to spot prey above, below, in front, behind, and on both sides of them.

Dragonflies hatch from eggs in or near bodies of freshwater. They hatch as larvae, or undeveloped forms that do not look anything like the adults. Dragonfly larvae live in water. They are fierce hunters and use a pair of fanglike pincers to catch worms, tadpoles, and small fish.

The larvae grow quickly and shed their skin several times. During this time they develop adult features. Eventually, the larvae crawl out of the water. They shed their skin one last time and fly away as adult dragonflies.

► More to explore

Insect

Drake, Francis

The navigator Sir Francis Drake helped to build up England's power during the reign of Queen Elizabeth I. He opened the Pacific Ocean to English ships. He also helped defeat the Armada, the fleet (group of ships) that Spain sent to conquer England.

Francis Drake was born in about 1540. At about age 13 he first worked as a sailor. In his early 20s he joined a slave-trading fleet. Off the coast of Mexico, the Spanish attacked the fleet. Drake disliked the Spanish from that time on.



Francis Drake



A map shows the route that Sir Francis Drake took on his trip around the world in 1577.

In 1572 Drake attacked a Spanish settlement in Panama. Then he marched across Panama and saw the Pacific Ocean. Spain controlled travel in the Pacific. Drake wanted English ships to be able to use the ocean.

In 1577 Queen Elizabeth sent Drake on an around-the-world voyage. Drake left England with five ships, but only his ship completed the trip. He passed through the Strait of Magellan, at the southern tip of South America, and into the Pacific. He then sailed up the coasts of South and North America. In 1579 he crossed the Pacific and Indian oceans. In 1580 he returned to England. His ship was loaded with treasure. Queen Elizabeth rewarded Drake by making him a knight.

In 1586 King Philip II of Spain gathered a fleet of warships—called the Armada—to invade England. In 1587 Drake destroyed many of the ships in a raid on the Spanish port of Cádiz. When the Armada invaded in 1588, Drake was a leader in driving it back. He became England's hero.

Drake's last voyages were less successful. In January 1596, while fighting the Spanish in the West Indies, he became ill and died.

► More to explore

Armada, Spanish • Elizabeth I

Drama

A drama is a type of story acted out before an audience, often in a theater.



The characters of Captain Hook and Peter Pan fight with their swords.

Dramas are commonly called plays. Other forms of literature, such as novels and short stories, are meant to be read by individuals. But through staged productions dramas are shared with many people at once.

Elements of Drama

A person called a playwright, or a dramatist, writes the play's text. The major elements of a play, or drama, include the characters and the plot. The characters, or the people in the story, often come into conflict with each other over something. For example, they may desire the



Fun costumes bring the characters to life in a performance of *Where the Wild Things Are* by Maurice Sendak.

same throne, princess, or treasure. The plot is what happens during the play and how the conflicts are settled.

In a play the characters use their words and movements to tell the story. Often the characters talk to each other. The words of their conversations are known as dialogue. Sometimes, however, a character will make a speech while alone onstage or with the other characters silent. This creates the illusion that the audience can hear the character's thoughts. That kind of speech is called a soliloquy. Occasionally a character will speak directly to the audience. That is called an aside.

A playwright might write dialogue that sounds natural, or how people of a particular time and place actually talk. Or the dialogue may be very formal. For instance, sometimes the characters' words are written in poetry. In some dramas the characters may sing or chant their words.

The playwright also writes short instructions, called stage directions, in the text. Some stage directions tell the actors what to do, such as when and where to enter the stage. Other directions may describe what a character looks like. They may also indicate the time and place of the action. The play's designers use these descriptions to create the scenery, costumes, and lighting.

Dramatic Traditions

Different dramatic traditions developed in Asia and the West (Europe and North America). In the dramas of many cul-

tures in Asia, dance, gestures, and music are often as important as the words. Asian dramas often use familiar stories as a base. They also tend to have a formal style. The actors may follow a set of rules about the facial expressions and body movements they use to tell the story.

On the other hand, Western dramas tend to focus on telling a new story through dialogue. Traditionally, Western dramas have been divided into two broad types: tragedies and comedies. Tragedies are serious stories about heroic individuals. They have a sad ending. Comedies are less serious and have a happy ending. Modern comedies are often funny. Today many Western dramas mix elements of tragedy and comedy.

History

Early Forms

Scholars believe that drama dates back to the time of the earliest peoples. Drama probably began as part of religious festivals and ceremonies. These took place in many cultures, including those of ancient Egypt, India, and China.

Western drama has its roots in ancient Greece. The great age of Greek drama was the 400s BC. Greek drama was written in poetry. A few actors portrayed all the play's characters. Greek playwrights also wrote parts for a group called the chorus. The chorus stood off to the side and described and explained the action. Greek tragedies told about important



Actors perform in William Shakespeare's *A Midsummer Night's Dream*.

people and events from legends or history. The comedies from this period often made fun of the day's political figures.

During the Middle Ages (AD 500–1500) in Europe most drama was based in Christianity. Some plays of the period told stories from the Bible. Others dramatized the lives of Christian saints or presented a moral lesson.

In the 1300s in Japan a new form of drama, called Noh, developed. A Noh drama presents classical Japanese legends using movement, music, and words. About 230 of the classical Noh stories are still performed today. A man named Zeami wrote 90 of them. He is considered the greatest Noh playwright.

The 1500s and 1600s were a great period for drama in England and Spain. Playwrights wrote in a wide range of styles. The greatest playwright of this period was William Shakespeare of England. He wrote complex, action-filled plays with realistic characters.

In the 1600s Jean Racine and other French dramatists wrote plays set in ancient Greece. Their plays featured grand themes and poetic language. The French playwright Molière wrote a different type of play. His comedies poked fun at the fashions and faults of French society of the time.

In the 1700s in Japan a type of puppet theater called Bunraku reached its artistic height. A man named Chikamatsu Monzaemon wrote Bunraku plays that were admired as both literature and entertainment. He wrote historical romances as well as tragedies about ordinary people of his time.

Modern Drama

In the 1800s and early 1900s many Western plays focused on ordinary people rather than kings, warriors, or legendary heroes. These plays explored the characters' inner struggles. Many plays also dealt with social problems, such as corruption and greed in society. Henrik Ibsen of Norway and Anton Chekhov of Russia wrote plays in this



August Wilson's play *The Piano Lesson* is about the African American experience in the United States.

realistic style. In England George Bernard Shaw used humor to attack society's problems. Eugene O'Neill of the United States used some of the themes of ancient tragedies. But he placed them in more modern times among everyday characters.

After World War II ended in 1945 many people felt discouraged about the state of the world. Some European playwrights wrote plots and dialogue that made little sense. This was meant to show that life is ridiculous. Their plays came to be known as Theater of the Absurd.

Other playwrights continued to explore familiar topics. In the United States Arthur Miller wrote dramas that focused on the inner lives and family conflicts of strong characters. Similar themes appeared in the plays of Tennessee Williams. Williams often set his plays in the southern United States.

In the late 20th and early 21st centuries playwrights of many different backgrounds began to produce notable dramas. Starting in the 1960s several African American dramatists, such as August Wilson, became successful. Social problems and the conflicts of ordinary people continued to provide material for playwrights. But many playwrights also experimented with bold, fresh ways of telling their stories.

► More to explore

- Dance • Literature • Music
- Shakespeare, William • Storytelling
- Theater

Drawing

Drawing is a form of art. To make a drawing, an artist puts lines on paper or another surface. Most artists start out by learning to draw. This is because drawing is the starting point for painting, sculpture, and other art forms.

Drawing Tools

Artists can choose from many tools for drawing. Pencils, pens, and pastels are common drawing tools. Artists' pencils come in a wide range of hardness. Softer pencils make darker marks. Artists' pens may have different tips for making wide or thin lines. Some artists use special pens that they dip in ink before drawing. Pastels are chalklike sticks made of colored powder. Other drawing tools include charcoal, crayons, and chalk.

Paper is by far the most common surface for drawing. Paper comes in many colors



Many artists draw with charcoal. Charcoal is made from partially burned, or charred, wood.

and textures. Artists often use smooth paper for fine drawing.

Many artists today use computers to create drawings. Special software allows artists to draw with a mouse or a drawing pad.

How Artists Draw

Drawings are usually made up of lines. An artist can put lines together to form figures, or pictures of things. Artists also can use lines to stand for borders between a figure and the space that surrounds it.

To create shadows, an artist can combine or cross lines. In a technique called hatching, an artist draws short, parallel lines to make light and dark areas. In a technique called crosshatching, an artist uses two sets of parallel lines that cross each other.

Not all drawings are made with just lines. Artists often fill in parts of their drawings by rubbing their drawing tools across the drawing surface. This technique creates shadows or areas of solid color. Some artists use spots and dots to fill in areas or to create forms.

History

People have been drawing since prehistoric times. Prehistoric people drew on cave walls, on rocks, and probably on sand. Early drawings eventually developed into writing. Ancient Egyptian writing, called hieroglyphics, was a system of picture symbols. Many of the characters in Chinese writing also were drawings at first.

Did You Know?

The drawing ink called India ink is made from the soot of burning wood or burning oil.



Many children draw on sidewalks with chalk. When it rains, the drawings are washed away.

Chinese artists made ink drawings as early as 3,000 years ago. By about 1,000 years ago the Chinese drew on scrolls, or long, rolled pieces of paper or silk. Asian artists generally used brushes instead of pens to make ink drawings.

Drawing in Europe became a form of fine art during the Renaissance. The Renaissance was a time of great culture that lasted from the 1300s through the 1500s. Artists in Italy—including Leonardo da Vinci, Raphael, and Michelangelo—made many fine drawings. Da Vinci created drawings of the human body as well as scientific drawings. In Germany the artist Albrecht Dürer made detailed pen-and-ink drawings of religious subjects.

Later European artists made drawings that showed their opinions. In the 1700s the English artist William Hogarth made drawings that made fun of human mistakes. In the 1800s the Spanish artist

Francisco Goya made drawings that showed the horrors of war.

In the 1900s many artists made drawings that looked less realistic than earlier drawings. They used geometric shapes or free-flowing lines to represent people and objects. Some artists made abstract drawings, or drawings that did not represent anything. These drawings were meant to express emotions or ideas. The Spanish artist Pablo Picasso made some of the greatest drawings of this period.

Today drawing is still a popular form of art. But people also use drawing for many business and entertainment purposes. Advertisers use drawings to sell products. Fashion artists and designers of products use drawings to plan their work. Illustrators and cartoonists draw pictures for books, newspapers, and magazines. In addition, many children and adults draw just for fun or relaxation.

► More to explore

Arts • Cartoon • Painting • Sculpture

Dred Scott Decision

In 1857 the U.S. Supreme Court ruled that Congress had no power to ban slavery in the territories, or areas that were not yet states. The ruling, called the Dred Scott decision, increased tensions between the proslavery South and the antislavery North.



Dred Scott was a slave who sued for his freedom. He did not win his court case.

Dred Scott was a black slave in Missouri. In 1834 he was taken to Illinois. Illinois was a free state, meaning that slavery was illegal there. Scott later lived in the territory of Wisconsin, where slavery was also illegal. When Scott was taken back to Missouri, he sued for his freedom. He argued that the time he had spent in a free state and a free territory had made him free.

Scott's court case began in Missouri and made its way up to the U.S. Supreme Court. The court ruled against him. In fact, the court said that he did not even have the right to file a lawsuit. The court also changed an earlier law that had banned slavery in territories north of Missouri. This angered people who were against slavery. The issue of slavery grew to be so much of a problem that it led to war between the

states in 1861. The defeat of the South in the American Civil War finally ended slavery.

► More to explore

American Civil War • Slavery • United States Government

Drought

Wherever there is a shortage of rain over a long period of time, there is drought. Drought affects plants, animals, and people. It is a serious problem for farmers and for the people who depend on the crops they produce.

Drought may occur almost anywhere in the world. Deserts receive very little rain all year. They are sometimes said to be in a permanent drought. Places that have a rainy season and a dry season have seasonal drought during the dry season. Other places can experience drought at any time.

Drought results from changes in Earth's atmosphere. Some droughts are caused by shifts in the winds that normally bring rain to an area. Others are caused by changing ocean currents, which affect the temperature and moisture of the air.

Severe droughts can last for months or years. When this happens no crops will grow. As a result many people and animals may die of famine, or lack of food. Severe droughts often force people and animals to move to find water. Some farmers go to places where they think conditions will be better for their crops

Did You Know?

Drought can lead to dust storms. When soil dries out and cracks it can be blown away by wind.



Cracked, dry dirt covers marshland in a drought region of California.

and animals. Some people give up farming altogether. They move to cities to find other types of work.

► More to explore

Atmosphere • Desert • Famine

Drug

A drug is a substance that changes the way a person's body works. Medical drugs can ease the symptoms of illnesses and fight diseases. Some people also use certain kinds of drugs for nonmedical purposes.

How Drugs Work

Some drugs work by changing the way cells in the body behave. For example, a chemical in the body called histamine causes the symptoms of allergies. Drugs called antihistamines ease these symp-

toms. The drugs do this by joining with cells to block the histamine.

Other drugs attack living things that invade the body—for example, bacteria and parasites. Drugs can kill these organisms, stop them from reproducing, or block their effects.

Medical Drugs

Patients get drugs from doctors or from pharmacies. Pharmacies can give certain drugs to patients only after a doctor orders them. Doctors' orders for drugs are called prescriptions. Patients can also buy some drugs without prescriptions—for example, aspirin and cough syrup.

Drug manufacturers must prove that their drugs are safe and that they work before they can be sold. In the United



Pain relievers, such as aspirin, are a very popular type of drug. Store shelves are crowded with the many different brands.

States the Food and Drug Administration studies all drugs before they can be sold there.

Illegal Drugs and Drug Abuse

Many governments around the world have banned the use of certain drugs—for example, marijuana, cocaine, LSD, heroin, and Ecstasy. These illegal drugs are generally not used as medicine. People often take illegal drugs for fun but ignore the harmful side effects. They may become addicted, or unable to stop taking the drugs. They may get sick or even die.

Such dangerous use of illegal drugs is called drug abuse. People can abuse legal drugs, too. They may take medication when they are not really sick, or they may take too much.

History

Throughout history almost every society has used drugs for medicine and for rituals. Early people made drugs from plants, animals, and minerals that they found in nature. Eventually scientists learned how to take different chemicals out of those natural materials. They studied what those chemicals did to the body and decided which illnesses they could treat. From those chemicals they created drugs.

► More to explore

Bacteria • Disease, Human • Parasite

Dublin



Population
(2006 census),
city, 506,211;
urban area,
1,186,159

Dublin is the capital of Ireland, a country in western Europe. The city lies on the Irish Sea. The River Liffey flows through the middle of Dublin.

Dublin is the largest city in Ireland by far. It is also the center of Ireland's economy and culture. Trinity College was founded in Dublin in 1592. It is Ireland's oldest university.

Dublin's economy grew greatly in the early 21st century. Most people in Dublin work in service industries such as



Dublin Castle lies on Cork Hill near the river. The English used the castle as their headquarters until 1922.

tourism and banking. The city is one of Europe's leading producers of computer software. Factories in Dublin make electronics, food products, beer, and medicines. The city is also the main port of Ireland.

Vikings from what is now Denmark founded Dublin in the 800s. In 1014 an Irish group took over the city. The English started taking control of Ireland in 1170. They made Dublin the center of the English government in Ireland.

In 1801 Ireland was joined to England, Scotland, and Wales to form the United Kingdom. As a result Ireland's lawmakers began to meet in London, England, instead of Dublin. Dublin lost some of its importance.

Irish groups began to rebel against English rule in the mid-1800s. Dublin was often the site of violence. In 1921 Ireland became an independent country with Dublin as its capital.

► More to explore

Ireland

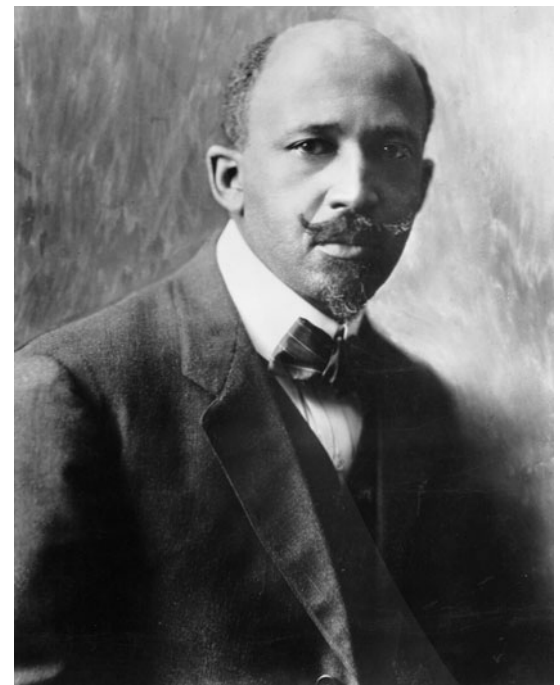
Du Bois, W.E.B.

W.E.B. Du Bois was an early leader of the civil rights movement in the United States. His goal was to win equal rights for African Americans.

William Edward Burghardt Du Bois was born on February 23, 1868, in Great Barrington, Massachusetts. He went to Fisk University and to Harvard University. He earned a doctoral degree at Harvard in 1895.

Du Bois became a professor who studied and wrote about black life in the United States. His most famous book, *The Souls of Black Folk*, encouraged blacks to fight inequality.

Du Bois disagreed with Booker T. Washington, another important African American leader. Washington opposed protest as a way to change society. Du



W.E.B. Du Bois

Bois believed that blacks could achieve racial equality only through protest.

In 1905 Du Bois began organizing groups to demand equal rights for blacks. In 1909 he helped form the National Association for the Advancement of Colored People (NAACP).

Late in life Du Bois lost hope that the United States could solve its racial problems. He became a citizen of Ghana, in West Africa, in 1963. He died there on August 27, 1963.

► More to explore

Civil Rights • National Association for the Advancement of Colored People
• Washington, Booker T.

Duck

The waterbirds called ducks are related to geese and swans. There are about 100 species, or types, of duck. They are found almost all over the world. Many types migrate, or fly long distances to spend different seasons in different regions. People keep ducks for their meat, eggs, and feathers. Some hunters shoot ducks for sport.

Physical Features

Ducks, geese, and swans are called waterfowl in North America and wildfowl in Europe. These birds have stout bodies and webbed feet. Soft inner feathers called down protect them from cold. A gland near the tail produces oil. This oil helps protect the outer feathers from water.



The male mandarin duck is known for its colorful markings.

Ducks are the smallest of the waterfowl. For instance, the mallard is a fairly large duck at about 24 inches (61 centimeters) long. Ducks' legs are set far back on their bodies. This helps them swim well but makes them waddle when walking.

Female ducks have mainly brown or gray feathers year-round. The males look like the females for part of the year. But most males have more colorful feathers during the breeding season. For example, breeding male mallards have shiny green heads.

Behavior

Many types of duck feed at the water surface. They dip their heads below the surface while tipping up their tails. These ducks are called dabbling ducks. They eat mainly plants and insects. They include mallards, black ducks, teals, pintails, and shovelers.

Many ducks nest on the ground near water. Perching ducks are dabbling ducks that nest in trees. They include the wood duck and the mandarin duck.

Ducks that dive deep into the water are called diving ducks. Some types eat mostly fish and live on the open seas.

These sea ducks include mergansers, scoters, and eiders. Other diving ducks stay close to shore.

► **More to explore**

Bird • Goose • Migration, Animal • Swan

Duncan, Isadora



Isadora Duncan based her dancing on natural rhythms and movements.

In the early 1900s the dancer Isadora Duncan created a new form of dance. Duncan rejected the strict rules of ballet, which was the main form of dance at the time. Duncan's free style of dancing came to be known as modern dance.

Duncan was born in San Francisco, California, on either May 26, 1877, or May 27, 1878. She was one of four children raised by their mother, a poor music teacher. At first her name was Angela Duncan. While in her teens she changed her first name to Isadora.

Duncan learned ballet as a child. However, ballet's rigid movements did not please her. She soon began to invent a more natural way to express herself through dance. Duncan performed in New York City and Chicago, Illinois, but she did not have much success. At age 21 she left for Europe.

Duncan's dancing fascinated European audiences. She danced to classical music, just as ballet dancers did. But Duncan made up many of her moves during each performance. She was the first Western dancer to perform barefoot and without tights. She wore a loose dress based on ancient Greek costumes.

Duncan eventually opened dance schools in France, Germany, the United States, and the Soviet Union. She taught her students how to follow the natural movements and rhythms of their bodies. Duncan's ideas inspired many future generations of modern dancers.

In 1922 Duncan married a poet from the Soviet Union. Many people in the United States feared the Soviets. Some accused Duncan of being disloyal to the United States. She then left her home country for good. Duncan died in Nice, France, on September 14, 1927.

► **More to explore**

Ballet • Dance

Dune, Sand

► see Sand Dune.

Du Sable, Jean-Baptist-Point



Jean-Baptist-Point du Sable

Jean-Baptist-Point du Sable was an African American trader. He was the first non-Native American to settle in what is now Chicago.

Du Sable was born around 1745 or 1750 in Saint-Domingue (now Haiti). His father was French-Canadian and his mother was a slave from Africa. In 1764 he moved to the French territory of Louisiana. He later settled in what is now Peoria, Illinois, where he married a Native American woman of the Potawatomi tribe.

In the 1770s the Du Sables settled near the southern shore of Lake Michigan. The Native Americans called the area by a name that is now spelled Chicago. There Du Sable established a successful trading post where he sold supplies and food.

In 1800 Du Sable sold out and moved to Missouri, where he continued as a farmer and trader until his death. But his 20-year residence on the shores of Lake Michigan had established his title as Father of Chicago. Du Sable died in Saint Charles, Missouri, on August 28, 1818.

► More to explore

Chicago

Dushanbe



Population
(2007 estimate)
660,900

Dushanbe is the capital of Tajikistan, a country in central Asia. The city lies



A monument in Dushanbe, Tajikistan, celebrates the city's history.

along the Varzob River. It is the country's center of transportation and industry. Factories in the city make cloth, electric cable, and refrigerators.

People have lived in the Dushanbe area since ancient times. It developed into a small market village. The Soviet Union took over the area in 1920. The Soviets built a new city at the site to be a regional capital. In 1929 the city was named Stalinabad. It was renamed Dushanbe in 1961. Tajikistan became an independent country in 1991 with Dushanbe as its capital.

► More to explore

Tajikistan

Dust Bowl

The worst drought (lack of rain) in U.S. history hit the southern Great Plains in the 1930s. High winds stirred up the dry soil. This caused huge dust storms that ruined farmland. The affected



A lack of rain and strong winds ruined farmland and created the region known as the Dust Bowl in the 1930s.

region came to be known as the Dust Bowl. It included southeastern Colorado, western Kansas, the panhandles of Texas and Oklahoma, and northeastern New Mexico.

Human mistakes made the drought worse. During World War I (1914–18) farmers planted new fields of wheat. Their plows removed grasses that had held the soil in place. Cattle grazing on ranches removed more grass. The loss of the grass cover loosened the soil.

Winds blew soil away in dust storms called “black blizzards.” The storms blocked out the sun and piled dirt in drifts. Some dust storms swept across the country to the East Coast.

During the drought, fields produced only one fourth as much wheat and corn as before. Farmers struggled even more because the drought came during the Great Depression. The depression was a time of great economic hardship. People whose farms were ruined could not find other jobs. Many moved to California, where farms were still operating.

The U.S. government helped the Dust Bowl area recover. Workers in government programs planted grass and trees to keep soil in place. A government agency taught farmers better farming methods. Near the end of the 1930s rainfall finally increased. By the early 1940s the fields in the Dust Bowl area were productive again.

► More to explore

Drought • Great Depression



Mammals are the only animals that have ear parts on the outside of the body.

(See Ear.)

The first Earth Day was celebrated in the United States in 1970.

(See Earth Day.)

A solar eclipse happens when the Moon comes between Earth and the sun.

(See Eclipse.)

The Eiffel Tower was built in 1889 for a fair to celebrate the 100-year anniversary of the French Revolution.

(See Eiffel Tower.)

More than 12 million people passed through the U.S. immigration center on Ellis Island between 1892 and 1924.

(See Ellis Island.)

Eagle

Eagles are large birds of prey, meaning that they hunt and eat animals for food. They are related to hawks, falcons, and vultures. Eagles have long held a special place in the human imagination because of their strength and soaring flight. The golden eagle has been a symbol of power since ancient times. The bald eagle is the national symbol of the United States.

Eagles are found nearly all over the world in many different habitats. There are more than 50 species, or types, of eagle. All are excellent hunters because of their keen eyesight, strong claws, and hooked beak. Different types of eagle eat a great variety of animals. Their prey ranges from fish, birds, or snakes to rabbits, foxes, monkeys, and even deer.

Female eagles are generally larger than males. A female bald eagle may be as long as 43 inches (1.1 meters). A male bald eagle is about 36 inches (0.9 meter) long. Golden eagles are similar in size.



The bald eagle was once endangered, or at risk of dying out. Laws protecting the bird helped to raise the number of bald eagles in the wild.

The main groups of eagles are sea eagles, booted eagles, forest eagles, and serpent eagles. Sea eagles snatch fish out of rivers, lakes, or seas. The bald eagle is a type of sea eagle that lives in North America. It is not actually bald. It has brown body feathers with white feathers on its head and neck.

The golden eagle is found in North America, Europe, Asia, and northern Africa. It is a type of booted eagle, which has feathers on its legs. The golden eagle is dark brown with golden feathers on its head and neck.

Forest eagles are huge birds that live in rain forests. Serpent eagles are snake-eating birds of Asia and Africa.

► More to explore

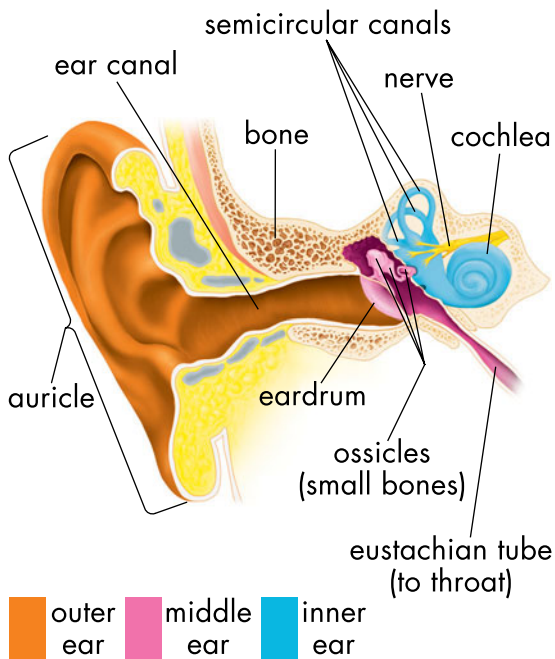
Bird • Bird of Prey • Falcon • Hawk
• Vulture

Ear

Ears are the organs, or body parts, in humans and many other animals that allow them to hear. Ears work by picking up vibrations (tiny back-and-forth movements), usually in the air or water. Then they change the vibrations into signals that the brain understands as sound. Ears also help an animal to keep its body in balance.

The Human Ear

Humans have two ears, one on each side of the head. Each ear has three sections: the outer ear, the middle ear, and the inner ear.



The three main parts of the human ear are the outer, the middle, and the inner ear.

The outer ear is divided into two main parts: the auricle and the ear canal. The auricle is the part of the ear that is visible on the sides of the head. It is made of a tough material called cartilage. It collects sound waves and sends them into a curved passageway called the ear canal.

The ear canal leads to the eardrum, which separates the outer ear from the middle ear. The eardrum vibrates when sound hits it. It then passes the vibrations to the middle ear.

The middle ear is an air-filled space. It is about 0.75 inch (1.9 centimeters) high and 0.20 inch (0.5 centimeter) wide. Inside this space are three small bones. These bones work together to send vibrations along to the inner ear.

The inner ear is filled with fluid. It contains the main organ of hearing, a coiled

tube called the cochlea. The vibrations make waves in the fluid of the cochlea. These waves produce the sound signals that are sent to the brain. The inner ear also has structures called the semicircular canals, which help to keep the body in balance.

Problems with the Ear

When people fly, drive in the mountains, or swim deep underwater, their ears may “pop.” This painful or stuffy feeling usually goes away on its own. Infections of the middle ear are a common problem in children. They often develop after a cold. Ear infections can be quite painful, but they are usually not serious. Serious problems with the inner ear can lead to deafness.

Ears of Other Animals

Ears are much more important to mammals than to other groups of animals. Only mammals have the outside ear parts called auricles. The ears of different mammals work basically the same way that human ears do. However, many



The huge auricles (outside ear parts) of a bat help it to tell from which direction a sound is coming.

mammals can move their auricles to pick up sound coming from any direction.

Other groups of animals have only some ear parts. Birds have an ear canal, a middle ear, and an inner ear. Their hearing is similar to that of humans. Most amphibians and reptiles have middle ears and inner ears with one bone. The eardrums of frogs and some reptiles are visible on the sides of the head. Snakes lack outer and middle ears. The snake's skull bones pass vibrations to the inner ear. Some fish have a simple inner ear buried deep in the head. Insects and spiders also lack ears, but they can sense vibrations in other ways.

► More to explore

Deafness • Sound



Amelia Earhart

She flew from the island of Newfoundland to Ireland. Her flight lasted 14 hours and 56 minutes.

Earhart next made a series of flights across the United States. She wanted to get more women involved in aviation. She also wanted to make flying more popular as a way to travel. For a time Earhart worked for one of the first regular passenger services to fly between New York City and Washington, D.C.

In June 1937 Earhart set out from Miami, Florida, to fly around the world. She took along a navigator, Fred Noonan, to help her find the way. On July 2 their plane vanished over the Pacific Ocean. The U.S. Army and Navy and the Japanese navy sent out searchers. However, no one ever found the two fliers or their plane.

Did You Know?

In January 1935 Earhart made a solo flight from Hawaii to California. She was the first pilot to succeed on the dangerous route.

Earhart, Amelia

Amelia Earhart was a pioneer of aviation. She was the first woman to fly alone across the Atlantic Ocean. She disappeared during a flight in 1937 and was never found.

Amelia Mary Earhart was born on July 24, 1897, in Atchison, Kansas. Her family did not want her to be a pilot, but she learned anyway.

In 1928 Earhart became the first woman to fly across the Atlantic. She was a passenger in an airplane that someone else piloted. Four years later she became the first woman—and only the second person—to fly across the Atlantic alone.

Earth

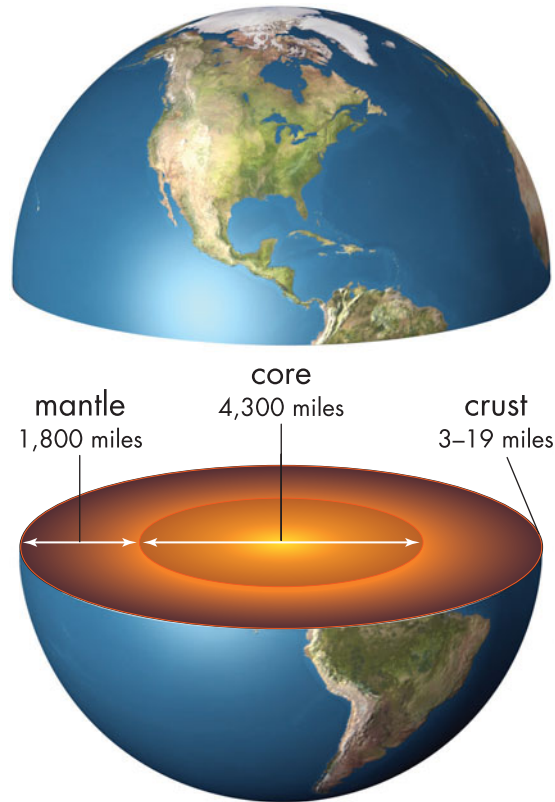
Earth is one of the eight planets that orbit, or travel around, the sun in the solar system. It is the third planet from the sun. Earth travels around the sun at an average distance of about 93 million miles (150 million kilometers). It appears bright and bluish when seen from outer space.

Earth is the only planet in the solar system that can support life. Life is possible on Earth because the planet has water on its surface and oxygen gas in its air. Earth also has the perfect range of temperatures for life. It is not too hot, like Venus, and not too cold, like Neptune. The average temperature on Earth is about 60° F (16° C).

Physical Features

Earth is the fifth largest planet in the solar system. It is made up of three layers: the core, the mantle, and the crust. The core is the center of the planet. It is about 4,300 miles (6,900 kilometers) across. The core is very hot. The mantle covers the core. It is about 1,800 miles (2,900 kilometers) thick. The crust is Earth's thin, rocky outer layer. At its thickest the crust is about 19 miles (31 kilometers) thick. Plants, animals, and people live on the crust.

Land covers about 30 percent of Earth's surface. The land is divided into seven huge pieces called continents. These continents are Africa, Antarctica, Asia, Australia, Europe, North America, and South America.



The three layers of Earth are the core, the mantle, and the crust. The crust is the thinnest layer.

Water covers about 70 percent of Earth's surface. This water is in the form of oceans, rivers, lakes, and groundwater. The four major water bodies on Earth are the Arctic, Atlantic, Pacific, and Indian oceans. They surround the continents. Some water is frozen. For example, there are large ice sheets in the Arctic and Antarctic regions.

The layer of gases surrounding Earth is called the atmosphere. This is the air that living things breathe. Earth's atmosphere goes up to a few hundred miles above the surface. The atmosphere gets thinner as it gets farther from the surface. It contains mostly water vapor and the gases nitrogen (77 percent) and oxygen (21 percent).



As seen from outer space, Earth looks like a bright blue ball with swirling white clouds.

Orbit and Spin

Like all planets, Earth has two types of motion: orbit and spin. Its orbit is the path it takes around the sun. It takes Earth 365.25 days to go around the sun once. This is equal to one calendar year. The force that keeps Earth orbiting the sun is called gravity.

Earth also spins, or rotates around its axis. The axis is an imaginary line that runs through Earth's center from the North Pole to the South Pole. Earth completes one rotation in 24 hours. This is equal to one day.

Seasons

Earth's axis does not run straight up and down in relation to the sun. Instead it is tilted slightly. As Earth moves around the sun, the North Pole is tilted toward the sun for about half the year. During this time the northern half of the planet, called the Northern Hemisphere, gets more sunlight than the southern half, or the Southern Hemisphere. During the

other half of the year the North Pole is tilted away from the sun. Then the Southern Hemisphere gets more sun than the Northern Hemisphere.

These differences in how sunlight hits different parts of Earth cause the seasons. For example, the Northern Hemisphere has its warmest season, summer, when it is tipped closer to the sun. At the same time the Southern Hemisphere has winter, its coldest season.

Satellite

Earth has one natural satellite called the Moon. A satellite is an object in space that orbits another object of a larger size. The Moon is about 239,000 miles (384,000 kilometers) from Earth.

Earth Through Time

Scientists believe that Earth is about 4.6 billion years old. Earth's surface has changed greatly since it was first formed. Some changes have taken place over millions of years as wind and water have eroded, or worn away, the land. Erosion has created features such as the Grand Canyon. Other changes have happened very quickly. The force of an erupting volcano or an earthquake can change the surrounding land in just hours.

The scientists who study these changes are called geologists. They have divided Earth's history into time periods called eons and eras. They use these periods to explain how and when changes on Earth took place. For instance, geologists have found that the Atlantic Ocean was

Did You Know?

Earth is the only planet of the solar system whose name does not come from Greek or Roman mythology.

formed during the Mesozoic era, a division of the Phanerozoic eon.

► More to explore

Atmosphere • Continent • Earthquake
• Erosion • Geology • Gravity
• Hemisphere • Moon • Planets • Season
• Solar System • Volcano

Earth Day

Every April 22, people celebrate Earth Day to show how much they care about the planet. Many people use the day to do projects that will help Earth. Some meet to discuss how to limit pollution and how to save endangered animals and plants. Others plant trees, clean up parks and beaches, or set up recycling stations. In some places concerts and organized walks raise money for environmental groups.

Gaylord Nelson, a U.S. senator, founded Earth Day. He asked Denis Hayes, a college student, to organize the first



Volunteers clear overgrowth from a hill in an Earth Day clean-up effort.

Earth Day events. About 20 million Americans celebrated the first Earth Day in 1970. The day made more Americans aware of the damage that people had done to the environment. In 1990 Hayes organized the first International Earth Day. About 200 million people in 141 countries took part.

► More to explore

Pollution • Recycling

Earthquake

In an earthquake, huge masses of rock move beneath Earth's surface and cause the ground to shake. Earthquakes occur constantly around the world. Often they are too small for people to feel at all. Sometimes, however, earthquakes cause great losses of life and property.

Causes

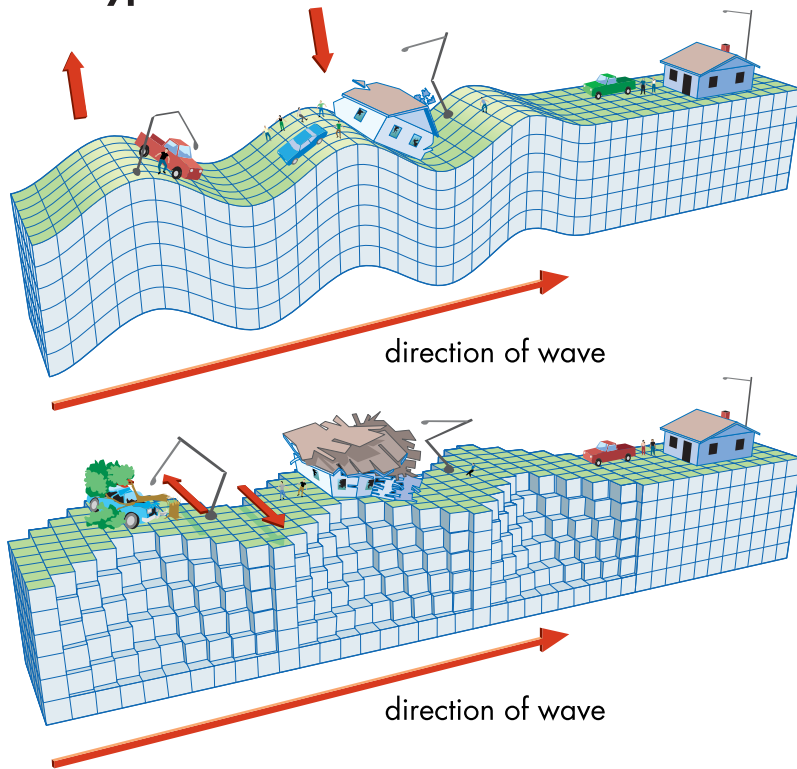
Most earthquakes are caused by changes in Earth's outermost shell, or crust. The crust is not a solid mass. Instead it is made up of about a dozen rock masses called plates that are constantly moving. In different places they move apart, collide, or slide past each other. Over time this movement causes great pressure to build up. When the pressure becomes too great, the rock masses suddenly shift along a crack in the crust, called a fault.

The shifting rocks release energy in the form of shock waves. The waves spread through the rock in all directions, causing an earthquake. In the most powerful quakes, people thousands of miles away

Did You Know?

The San Andreas Fault in southern California is about 650 miles (1,050 kilometers) long. It can easily be seen from above the ground.

Two Types of Ground Movement



In an earthquake, the ground can move up and down. It can also move sideways.

from the center of the quake can feel the ground shake.

A small number of earthquakes have other natural or human causes. The movement of molten rock beneath a volcano can trigger an earthquake. The pressure resulting from holding vast amounts of water behind large dams can cause minor quakes. So can underground nuclear explosions and the digging of mines.

Effects

An earthquake may be powerful enough to change the surface of Earth, thrusting up cliffs and opening huge cracks in the ground. Earthquakes can do great damage to buildings, bridges, railroads, and other structures. The violent shaking

during earthquakes often causes other Earth movements, such as avalanches. Some quakes happen in or near oceans. These quakes can cause huge, destructive waves called tsunamis to sweep ashore.

Where Earthquakes Occur

Most earthquakes take place along the boundaries of Earth's crustal plates. One great earthquake belt circles the Pacific Ocean along the mountainous west coasts of North and South America and runs through the island areas of Asia. It is known as the ring of fire. The famous San Andreas Fault of California is part of this belt.

A second, less-active belt is between Europe and North Africa in the Mediterranean region and includes portions of Asia. A small number of quakes occur in the interior of plates rather than along the edges.



An earthquake in Japan was powerful enough to destroy an elevated expressway.

Measuring Earthquakes

Scientists record the shock waves produced in an earthquake with an instrument called a seismograph. They measure the strength of a quake in different ways. The Richter scale measures earthquakes based on the amount of energy they release. The weakest earthquakes are close to zero on the scale; the strongest measure about 9. The Mercalli scale measures the amount of destruction caused by an earthquake on a scale of 1 to 12.

► More to explore

Avalanche • Earth • Energy • Plate Tectonics • Ring of Fire • Tsunami • Volcano

Easter

Easter is the holiest day of the year for Christians. It celebrates their belief in the resurrection, or the rising from the dead, of Jesus Christ. Jesus was the founder of the religion of Christianity. Easter is always observed on a Sunday in the Spring, but its date varies.

The week before Easter Sunday is known as Holy Week. During this week, Christians remember the events they believe took place at the time of Jesus' death. Palm Sunday recalls the entrance of Jesus into Jerusalem shortly before his death. Holy Thursday marks the Last Supper of Jesus with his disciples, or followers. Good Friday remembers the crucifixion, when Jesus was killed by being nailed to a cross. Christians believe that Jesus was resurrected on the



Christians attend an Easter service at sunrise near the Grand Canyon in Arizona.

third day after his death. Easter is therefore a celebration of new life.

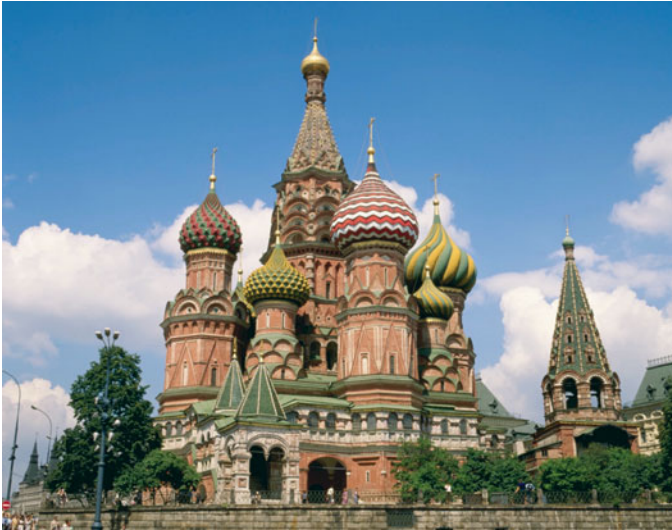
On Easter, Christians attend special church services. A number of popular folk customs are also associated with Easter. These have to do with rabbits and colored eggs, which are ancient symbols of new life. In some countries children color eggs and then the eggs are hidden for them to find. According to tradition the Easter Bunny also leaves eggs and candy for children on Easter morning.

► More to explore

Christianity

Eastern Orthodox Churches

Eastern Orthodoxy is one of the main branches of Christianity. Eastern Orthodoxy consists of a group of churches,



Some Eastern Orthodox churches have onion-shaped domes.

most of which are associated with a particular country. The patriarch, or leader, of Constantinople (present-day Istanbul, Turkey) is the general representative of Eastern Orthodoxy. But each church is independent and selects its own head. There are more than 200 million Orthodox Christians in all.

Beliefs and Practices

The Orthodox Christians trace their history back to the beginnings of Christianity. They believe that they follow Christianity in the same way that the first Christians did. Unlike Roman Catholics, they do not recognize the authority of the pope.

Every Sunday, Orthodox churches celebrate their most important service, the Divine Liturgy. During the service, church members eat bread in memory of Jesus' Last Supper. As in other Christian churches, this is known as Communion. It is one of the seven sacraments, or holy ceremonies, of the Orthodox church.

History

Christianity became the official religion of the Roman Empire in the AD 300s. In the 400s the western part of the empire fell to invaders. But the eastern part survived for another 1,000 years as the Byzantine Empire. The pope emerged as the leader of the Western church, and the patriarch of Constantinople became the head of the Eastern church.

The Eastern and Western churches disagreed on several issues. They grew apart over several centuries and finally officially separated in 1054. They came to be called the Eastern Orthodox churches and the Roman Catholic church.

Muslim Turks conquered the last part of the Byzantine Empire in 1453. The Russian church, which was outside the empire, was the only Orthodox church that remained free of Turkish rule. It thus took a leadership role among the Orthodox churches.

► More to explore

Byzantine Empire • Christianity • Jesus Christ • Roman Catholicism • Rome, Ancient

East Indies

The East Indies is the world's largest island group. It is sometimes known as the Malay Archipelago. The East Indies includes the Moluccas, which were once fabled as the Spice Islands.

The islands extend for more than 3,800 miles (6,100 kilometers). They lie between the Asian mainland in the



north and west and Australia to the south. The term East Indies has been used at different times to refer to different sections of these islands. In a general sense the term East Indies includes all of the islands in the area, as well as all of mainland Southeast Asia and India.

More specifically, the group consists of the more than 13,000 islands that make

up Indonesia, parts of Malaysia, Brunei, and Papua New Guinea. The islands of the Philippines are also sometimes included in the East Indies.

The East Indies were famous for their spices at least 4,000 years ago. For many years spices were considered very valuable. People traveled far to buy and sell them, and important cities started as trading centers. Europeans looking for new routes to the East Indies discovered the lands of the Americas. For centuries European powers also fought over the riches of the East Indies. They took control of much of the area and established colonies there. No European colonies remain in the East Indies today, however.

► More to explore

Brunei • Indonesia • Malaysia • Papua New Guinea • Philippines



On an island in the East Indies, baskets of garlic and spices are ready for sale at a market. The islands have long been known for their spices.



East Timor

East Timor is one of the world's newest countries. Its capital is Dili.

Geography

East Timor covers the eastern half of the island of Timor in Southeast Asia. The western half is part of Indonesia. East Timor also includes an area called Ambeno (on the northwestern coast of Timor) and two small islands.

East Timor is mountainous and dry. Sandalwood trees grow in hilly areas. Shrubs, grass, coconut palms, and eucalyptus trees grow in the lowlands. Wildlife includes monkeys, deer, civet cats, snakes, and crocodiles.

People

Most of the people of East Timor have Southeast Asian or South Pacific roots. Christianity is the chief religion. The major languages are Tetum, Portuguese, Indonesian, and English.

Economy

Most of the people of East Timor work as farmers. Important crops include corn, rice, cassava, sweet potatoes, and coconuts. The country also produces



East Timorese girls perform a traditional dance in Manatuto, East Timor.

coffee, livestock, and clothing. Supplies of oil and natural gas lie offshore.

History

Little is known of Timor's early history. The Portuguese settled on the island in 1520. The Dutch also claimed part of the island, and the two countries fought for control for many years. Portugal gained firm control over East Timor by 1914. In 1975 East Timor declared its independence. However, Indonesia soon invaded.

In 1999 Indonesia allowed East Timor to vote for or against independence. The voters chose independence, but armed groups that opposed it killed hundreds and left the country in ruins. The United Nations stepped in to keep peace as East Timor set up a government. In 2002 East Timor became an independent republic.

► More to explore

Dili • Indonesia

Facts About EAST TIMOR



Population
(2008 estimate)
1,078,000

Area
5,639 sq mi
(14,604 sq km)

Capital
Dili

Form of government
Republic

Major cities
Dili, Dare, Baucau, Maliana, Ermera



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Echidna

Echidnas are unusual mammals. Along with their relative the platypus, echidnas are the only living mammals that lay eggs. Echidnas are also called spiny anteaters.

There are three species, or kinds, of echidna. The short-nosed echidna is common in Australia and on the island of Tasmania. Two species of long-nosed echidna live only on the island of New Guinea.

Echidnas are stocky animals with a short tail. They have brownish fur with spines sticking through. Their feet have strong claws that are good for digging. They have a very small mouth and a long, sticky tongue. The short-nosed echidna is about 12 to 18 inches (30 to 45 centimeters) long. It has a straight snout that points forward. The long-nosed echidnas are usually 18–31 inches (45–78 centimeters) long. They have a longer, downward-pointing snout.

The short-nosed echidna eats ants and termites that it catches with its long, sticky tongue. Long-nosed echidnas eat mostly earthworms.

A female echidna usually lays a single leathery egg. The mother holds the egg in a pouch on her body. It hatches about 10 days later. The newborn lives in the pouch for about two months. The baby sucks milk through special hairs on the mother's body. The young echidna goes



The short-nosed echidna is a common mammal in Australia.

off on its own after it has grown spines and fur and can find its own food.

► More to explore

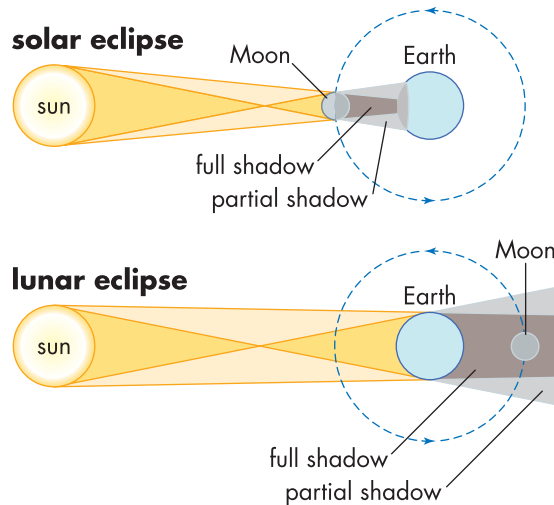
Anteater • Mammal • Platypus

Eclipse

An eclipse happens when one object in space blocks another from view. For example, during a solar eclipse the Moon comes between Earth and the sun. The Moon blocks the sun for a time so that people on Earth cannot see it.

In ancient times solar eclipses caused great fear and wonder. People did not understand why the sky sometimes darkened in the middle of the day. Today scientists understand why eclipses happen and can determine when they will occur.

Eclipses happen because planets, moons, and other objects constantly move through space. For instance, Earth travels around the sun in a path called an



During a solar eclipse the Moon passes between the sun and Earth. During a lunar eclipse Earth passes between the sun and the Moon.

orbit. As Earth moves around the sun, the Moon makes its own orbit around Earth. An eclipse involves three space objects temporarily lining up in a row.

Solar Eclipses

In a solar eclipse the Moon passes between the sun and Earth. This prevents the sun's light from reaching Earth. As the Moon passes in front of the sun, the Moon's shadow sweeps across Earth. The sky gradually grows darker.

If the sun's light is completely blocked, the Moon appears as a black circle. What looks like a ring of fire appears around the circle. This ring is the corona, or the gases that surround the sun.

Earth and the Moon keep moving. After a few minutes the sky begins to lighten again.

A solar eclipse is called total if the sun appears totally dark. If only part of the sun appears dark it is a partial eclipse. During an eclipse some people on Earth will see a total eclipse, others will see a partial eclipse, and many others will not notice any difference in the sun. Only the people within the small area covered by the center of the Moon's shadow will see a total eclipse. People just outside of that area will see a partial eclipse.

Looking directly at any solar eclipse can seriously hurt one's eyes. It should never be attempted.

Lunar Eclipse

The Moon does not make any light itself. Rather, the sun shines on the Moon, and the reflected sunlight makes the Moon visible from Earth.

During a lunar eclipse Earth blocks sunlight from reaching the Moon. The sun, Earth, and the Moon line up, with Earth



The sun's corona shines brightly around the Moon during a total solar eclipse.

in the middle. The Moon is then in Earth's shadow. But the Moon does not appear completely dark. Instead, it glows a dim orange or red color. This is because some light reaches the Moon indirectly. This light bounces off the gases surrounding Earth and then hits the Moon.

Lunar eclipses can be total or partial. Unlike a solar eclipse, a lunar eclipse is safe to view directly.

► More to explore

Earth • Moon • Sun

Ecology

Ecology is the study of the relationships between living things and their surroundings, or environment. Scientists who work in ecology are called ecologists. Ecologists examine how living things depend on one another for survival. They also study how living things use such natural resources as air, soil, and water to stay alive.

Some ecologists work in laboratories. Laboratory experiments allow ecologists to study things under controlled conditions. For instance, they can experiment to see how plants react to different amounts of light or water. Such studies are harder in a natural setting because weather and other natural conditions cannot be controlled.

However, many ecologists do work in natural, outdoor settings. They look at all the different factors that affect ecosystems, or communities of living things.



An ecologist studies pitcher plants as they grow in a nature preserve in North Carolina.

Studies in the outdoors are useful because they show what is actually happening in the environment.

Ecology is important because it shows how changes in the environment affect the survival of living things. For example, when pollution kills certain living things, the animals that feed on them also may die. The work of ecologists has convinced many people to protect the environment and all the ecosystems that it supports.

► More to explore

Ecosystem • Environment • Living Thing

Economics

Economics is the study of the economy, or the part of a society that creates wealth. Wealth is not just money. Wealth comes from the production of goods and services, which people buy with money. People who study economics, called economists, look at how

people create wealth, how they use it, and how different people get different amounts of it.

Parts of an Economy

A society creates wealth by producing goods and services. Goods include such objects as apples, cars, and roads. Services are things that people do for others, such as gymnastics lessons, banking, and dental care. People who buy these goods and services are called consumers.

The process of creating the goods and services is called production. There are three major factors in production. The first is land. Land can mean a large farm or a tiny workshop. Land also includes natural resources like oil and minerals. The second factor of production is labor, or people who work for pay. Workers may be rewarded with wages, or—if they own the business—with profits. (Profits are the money that a business keeps after paying costs.) The third factor of production is capital. This includes the tools, factories, and

offices that are used to make the goods and services.

All the companies producing a particular kind of product or service are grouped together in what is known as an industry. Industries that make things are called manufacturing industries. Industries that sell services are called service industries.

Branches of Economics

There are several different branches of economics. The study of individual consumers and businesses is called microeconomics. The study of how a whole country's economy works is called macroeconomics.

Microeconomics

Economists who study microeconomics look at how consumers spend their money. They try to explain why consumers buy one product rather than another. They also look at why companies choose to produce one good or service rather than another.

The amount consumers want to buy is called demand. The amount companies produce is called supply. Price strongly affects supply and demand. If a manufacturer charges a high price for a product, usually it will sell few products. If it reduces the price, usually it will sell more products.

Macroeconomics

Economists who study macroeconomics look at the value of all the goods and



The economics of supply and demand sets the prices in a village market.

services that a country produces. In this way, they measure a whole country's wealth.

Governments are interested in macroeconomics, too. A government plays an important role in its country's economy. When a government decides which goods and services should be produced and sold, the economy is said to be planned. Countries with socialist or Communist governments usually have planned economies.

By contrast, when a government lets companies and consumers decide what will be produced, the economy is called a free market. Countries with capitalist governments have free-market economies. But even capitalist governments affect the economy. They do this by raising or lowering taxes and changing the amount banks can charge for loans. These actions cause people to have more or less money to spend on goods and services.

► More to explore

Capitalism • Communism • Industry
• Manufacturing • Money • Socialism

Ecosystem

An ecosystem is a group of plants, animals, and other living things that live in the same surroundings. An ecosystem also includes nonliving materials—for example, water, rocks, soil, and sand. A swamp, a prairie, an ocean, and a forest are examples of ecosystems.



A swan builds a nest in a wetland ecosystem in England.

Each living thing in an ecosystem has a role to play—as a producer, a consumer, or a decomposer. Green plants are producers. They make their own food through a process called photosynthesis. Animals, including humans, are consumers. They eat, or consume, plants or other animals. Bacteria and other living things that cause decay are decomposers. They break down the waste products and dead tissue of plants and animals. They return nutrients to the soil. The way that producers, consumers, and decomposers provide nutrients for one another is called a food chain.

An ecosystem's health depends on a delicate balance among all its members and the environment. If something disturbs the balance, the ecosystem and all its members may suffer. Natural things such as a changing climate can disturb ecosystems, as can human activities such as polluting.

► More to explore

Environment • Food Chain • Living Thing



Ecuador

Ecuador gets its name from the equator, which passes through the northern part of the country. Located in northwestern South America, Ecuador straddles part of the Andes Mountains and occupies part of the Amazon River basin. The capital city, Quito, stands on the lower slopes of an old volcano.

Geography

Ecuador is bordered by Colombia, Peru, and the Pacific Ocean. Its territory includes the Galápagos Islands, which lie to the west.

Along the coast the land is flat, with tropical rain forest in the north and desert in the south. Two ranges of the Andes Mountains run from north to south through central Ecuador. The highest peak is Chimborazo, at 20,702 feet (6,310 meters). Between the ranges are fertile valleys and plateaus. East of the Andes, rain forests grow in the basin

of the Amazon River. In this region the Napo River flows toward Peru.

Most of Ecuador has a hot, humid climate year-round. The mountain regions are cooler, and the highest peaks are snowcapped.

Plants and Animals

Palms grow in the central part of Ecuador's coast. The coastal region is also the agricultural center of the country. The mountains have some evergreen forests as well as grasses at higher elevations. Logging has threatened many of Ecuador's rain forests.

In the rain forests live monkeys, jaguars, ocelots, foxes, weasels, otters, skunks, raccoons, coatis (relatives of the raccoon), and tree-dwelling mammals called kinkajous. The Galápagos Islands are known for their unusual animal life, including giant tortoises and marine iguanas.

People

More than 40 percent of Ecuadorans are mestizos—people with mixed European and American Indian roots. Almost the same number of people are American Indians. Whites, blacks, and Asians form smaller groups. Most people are Roman Catholics. Spanish is the official language, but many Indians speak Quechua or Shuar.

Most Ecuadorans live in cities along the coast or in the mountains. Very few





Cotopaxi is an active volcano in the Andes Mountains of Ecuador.

people live in the eastern part of the country.

Economy

Ecuador's economy depends on natural resources and agriculture. The country produces mainly oil, bananas, and shrimp. Other important products include sugarcane, palm oil, rice, corn, cut flowers, and canned fish. In recent years manufacturing has increased in Ecuador. Factories make tires, textiles, and other items.

History

The land now known as Ecuador had a long history before the arrival of Euro-

peans. People there made pottery figures as early as 3000 to 2500 BC. In the AD 1400s the Inca of what is now Peru conquered the area. They ruled until Spain invaded in 1534. The Spanish built huge estates and forced the Indians to work on them.

With help from Simón Bolívar, Ecuador won its independence from Spain in 1822. It joined Colombia and Venezuela to form the Republic of Colombia, called Gran Colombia. Bolívar served as its president. Ecuador left the republic in 1830 and became an independent country.

Since independence Ecuador has had many changes of government. Because of the constant change, it has been difficult for Ecuadorans to make progress. However, Ecuador solved one long-standing problem in 1998, when the president signed a peace treaty with Peru. The two countries had been fighting for many years over part of their shared border.

► More to explore

Andes • Bolívar, Simón • Galápagos Islands • Quito

Facts About ECUADOR



Population
(2008 estimate)
13,481,000

Area
105,037 sq mi
(272,045 sq km)

Capital
Quito

Form of government
Republic

Major cities
Guayaquil,
Quito, Cuenca,
Machala, Santo
Domingo de los
Colorados,
Manta



Women sell reeds at a market in Ecuador. The reeds are used to make hats.

Edinburgh



Population
(2006 estimate)
464,000

Edinburgh is the capital of Scotland, one of the four main parts of the country called the United Kingdom. The city is known as a place of learning. Through the years it has produced many great thinkers and writers.

Cityscape

Edinburgh is built on a series of hills and rocky ridges. It has a port on a part of the North Sea.



Edinburgh Castle is one of Scotland's most popular tourist attractions.

The oldest section of Edinburgh is called the Old Town. It developed around Castle Rock, which rises high above a valley floor. At its top stands Edinburgh Castle, the home of Scottish kings and queens in ancient times.

Edinburgh's other main section is the New Town. Despite its name, it is more than 200 years old. Today it is the city's main business area.

Economy

Edinburgh is a major center of banking and law. Other services, such as education, health care, trade, and tourism, are also important.

History

People have lived in the Edinburgh region for thousands of years. What is now called the Old Town dates back to the 1000s.

Edinburgh became Scotland's capital in the 1400s. Scotland was then an independent kingdom. It became part of the United Kingdom in 1707.

In the 1700s Edinburgh became a great cultural center. Many important philosophers, writers, and scientists lived there. It was also the birthplace of the *Encyclopædia Britannica*.

Edinburgh's New Town was built in the late 1700s and early 1800s. The city grew greatly over the next century.

Scotland began to govern most of its own affairs again in 1999. Scottish law-

makers began meeting in Edinburgh once more.

► More to explore

Scotland • United Kingdom

Edison, Thomas Alva

Thomas Edison was called a “wizard” because of his many important inventions. He created more than 1,000 devices on his own or with others. His best-known inventions include the phonograph (record player), the lightbulb, and motion-picture equipment.

Thomas Alva Edison was born on February 11, 1847, in Milan, Ohio. He experienced hearing loss at an early age. He was an imaginative and curious child. He did poorly in school, though,



Thomas Edison poses with a phonograph that recorded sound on sheets of tinfoil.

perhaps because he could not hear his teacher. His mother then educated him at home.

When Thomas was a teenager he became a telegraph operator. Telegraphy was one of the nation’s most important communication systems at the time. Thomas was good at sending and taking messages in Morse code. He loved tinkering with telegraphic instruments, and he developed several improvements for them. By early 1869 he had quit his telegraphy job to become a full-time inventor.

Edison built research laboratories at Menlo Park and West Orange, New Jersey. He later created companies that produced and sold his successful inventions.

Although most of his life was devoted to his work, Edison’s family was also important to him. He married twice and had six children. Edison died on October 18, 1931.

► More to explore

Telecommunication • Telegraph

Education

Education is the process of gathering information about the world and oneself. Formal education is learning that takes place in schools or with private teachers. People also learn from their families, with friends, while traveling, and in many other places. This is called informal education.

Did You Know?

Edison also worked to develop the electric power systems that bring electricity into homes and businesses.



Education gives students the answers to many questions.

Formal Education

Many children around the world go to free, public schools. Others go to private schools, which charge tuition, or fees. Some study at home with parents, which is called home schooling. Some have tutors, or private teachers.

Different countries provide different levels of formal education. In the United States formal education starts with pre-school and kindergarten. At about age 6, children begin primary school, which is also called grade school or elementary school. Some communities have middle schools or junior high schools for students between 11 and 14 years old. High school, or secondary school, lasts from about age 14 until about age 18.

Many students continue their education after high school. Some attend trade schools or community colleges. Others go to state colleges and universities. Some go to private colleges and universities.

Adults who have finished their formal education can continue their education at night or on weekends. The courses they take are known as continuing education or adult education classes.

History

In the earliest times children got their education directly from parents and other adults. They learned mainly skills for survival.

Eventually people established cities and advanced civilization. As societies developed they set up schools to teach reading, writing, arithmetic, and other subjects.

The first schools were usually just for boys. Most of the students came from rich and powerful families. Often the purpose of their education was religious training.

Some schools had other purposes as well. Many schools focused on military training. Sometimes youths attended special schools to learn the art of public speaking. These skills were meant to help them become future leaders.

Most girls received their education at home. They learned cooking, sewing, and other useful skills.

Over time education became available to more people, not just the rich and powerful. The governments of some countries set up public systems of education in the 1800s. More schools opened to girls.



An African student uses a pointer and blackboard.

In the United States many early schools had only a single room and one teacher. Children of every age learned together. In 1751 Benjamin Franklin founded a secondary school—the first of many. Students studied such subjects as history, mathematics, and navigation. In the 1800s free elementary and secondary schools opened across the United States.

During the 1900s, as education became more important, teachers colleges opened. The requirements for becoming a teacher became stricter. Teaching became a highly respected profession.

► More to explore

Arithmetic • Writing

Eel

Eels are fishes that look like snakes. There are hundreds of different species,

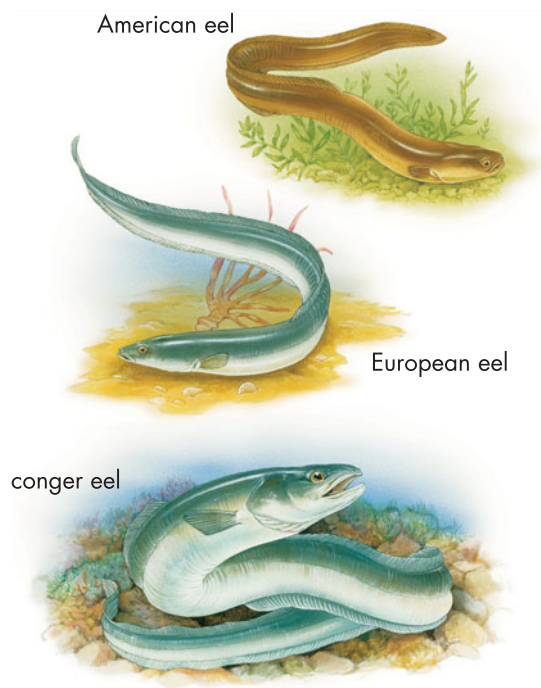
or types, of eel. They belong to a large group of fishes called the eel order.

Where Eels Live

Many species of eel live in warm, salty seas and oceans. Morays and congers are two well-known types of marine, or sea, eel. Freshwater eels live in rivers, lakes, and ponds on almost every continent. They travel to saltwater to reproduce.

Physical Features

Adult eels range in length from 4 inches (10 centimeters) to 11.5 feet (3.5 meters) long. An eel has a pointed head, sometimes with a wide mouth and sharp teeth. A fin runs along the back and around the tip of the tail. The body is usually smooth. Deep-sea eels are often black or gray. Eels that live in tropical reefs may have bright colors and patterns.



The American and European eels live in freshwater. Congers are marine, or sea, eels.

Behavior

Many species of eel hide in mud or among rocks during the day. They come out at night to hunt for food. Eels eat shrimps, snails, fishes, mussels, and worms.

Eels generally live alone. But garden eels live in colonies of hundreds of eels. Each garden eel hides in a tube that it digs in the sandy ocean floor.

Eels breathe through gills, as other fishes do. But freshwater eels also can absorb oxygen through their skin. This allows them to move across land.

Life Cycle

Baby eels, or larvae, hatch from eggs in the ocean. The larvae are typically flat and transparent. After a period of growth, they go through metamorphosis. This is a series of changes that turn the larvae into young eels, or elvers. Elvers look like miniature adult eels.

After the elvers reach adulthood, they are ready to mate. Most species migrate, or travel, to a particular area to mate and lay eggs.

► More to explore

Fish • Metamorphosis

Egg

The young of most animals grow from eggs. Only female animals make eggs. Male animals make cells called sperm. A sperm must join an egg before the egg can grow into a new animal.



Some insects, such as ladybugs, lay their eggs on plant leaves or stems.

In most mammals, the egg is just a cell, called an ovum, inside the mother's body. A sperm cell joins with the egg cell in a process called fertilization. The fertilized egg grows and develops inside the mother until the baby is ready to be born. Most other female animals lay eggs, or release them outside their body to develop.

Eggs need protection while the young develop inside them. Fish eggs often float in a protective jelly. Bird and reptile eggs have an outer shell. In bird eggs the shell is hard; in reptile eggs it is tough and elastic. Eggs with shells contain an egg cell and food, called yolk, for the developing young, called an embryo.

Many animals, including humans, eat the eggs of other animals. Fish eggs, called roe or caviar, are common in Japanese food. People around the world eat bird eggs, especially those of chickens and ducks.

Did You Know?

Scientists consider the fish called electric eels to be different from true eels. Electric eels live in South American waters.

Egypt

The Arab Republic of Egypt is a country in the northeastern corner of Africa.

Ancient Egypt was one of the earliest and most important civilizations in the world. The modern country plays a key role in Middle Eastern politics. Egypt's capital is Cairo.

Geography

Egypt shares borders with Libya, Sudan, Israel, and the Palestinian territory of the Gaza Strip. Egypt's northern coast is on the Mediterranean Sea, and its eastern coast is on the Red Sea. The Nile River flows northward into the Mediterranean. It fans out into the Nile delta, a triangular area at the mouth of the river.

The Nile divides Egypt into the Western Desert and the Eastern Desert. The Western Desert is low-lying and generally flat. The Eastern Desert has rolling hills and mountains in the southeast. To the northeast is the Sinai Peninsula, the only land bridge between Africa and Asia. The Suez Canal separates Sinai from the rest of Egypt.

Egypt has only two real seasons: a cool, mild winter and a hot summer. The climate is very dry and sunny.

Plants and Animals

The Western Desert has very few plants. The Eastern Desert and Sinai have thorny shrubs, small desert plants, and herbs. The acacia is one of the few native trees. Around the Nile are date palms

and many water plants, including reeds and grasses.

Egypt's wild animals include mountain sheep and goats, gazelles, miniature desert foxes, hares, jackals, and mon-gooses. Rodents, insects, lizards, and snakes are also common. Many types of birds live in Egypt year-round or pass through on their migrations.

People

Most Egyptians are descendants of the Hamites of ancient Egypt and of the Arabs who migrated to Egypt centuries ago. Other groups include Nubians, Roma (Gypsies), Armenians, and Greeks. Arabic is the official language, and Islam is the official religion. About 15 percent of Egyptians are Christians, mostly members of the Coptic Orthodox Church. Egypt also has a small Jewish community. Almost all Egyptians





Muslims kneel in prayer on a street in Cairo.

live in the Nile valley and delta. More than half of the people live in rural areas.

Economy

Mining and manufacturing are important parts of Egypt's economy. The country mines petroleum (oil) and natural gas. It produces valuable crude oil, cotton goods, processed foods, chemicals, iron, and steel.

About one fourth of workers are farmers. Much of Egypt's farming income comes from cotton and rice, which it sells to other countries. Other crops include sugarcane, corn, tomatoes, wheat, potatoes, oranges, dates, and grapes.

Tourism is also very important to the economy. Visitors come to see the Great Pyramids at Giza, the Sphinx, and other monuments of ancient Egypt.

History

Native kings and queens ruled in ancient Egypt for most of the country's first 2,500 years, from about 2925 BC until 332 BC. In 332 BC Alexander the Great, the king of Macedonia, invaded Egypt. Macedonians ruled Egypt until 30 BC, when it fell to the Romans. (For more information about Egypt's early history, *see* Egypt, Ancient.)

Arabs conquered Egypt in AD 642.

Within a few hundred years, Egypt was transformed into an Arabic state. The people gradually converted from Christianity to Islam.

Ottoman Rule and British Control

In 1517 the Turkish Ottoman Empire took control. Future emperor Napoleon I of France invaded in 1798, but the Ottomans soon regained power. Muhammad 'Ali, an officer in the Ottoman army, became governor of Egypt in



Men ride camels near the three pyramids of Giza in Egypt.



TIMELINE

Alexander the Great invades Egypt.

332 BC

Arabs conquer Egypt.

AD 642

Great Britain occupies Egypt.

1882

Egypt becomes a republic.

1953

Rome takes control of Egypt.

30 BC

Egypt becomes part of the Ottoman Empire.

1517

Egypt gains independence.

1922

1805. He introduced many reforms in order to modernize the country. Members of 'Ali's family governed Egypt for more than 100 years.

Egypt allowed a French company to build the Suez Canal in 1859–69. British troops occupied Egypt in 1882, and in 1914 the British made Egypt a British protectorate, or dependent state.

Independence

In 1922 Egypt gained independence. In the 1940s it helped to found the Arab League, a union of several Arab countries. The league became involved in the growing disputes between Arabs and Jews in neighboring Palestine. In 1948, after part of Palestine became the country of Israel, Egypt and its Arab allies attacked Israel but were defeated.

A military group overthrew Egypt's king in 1952. Gamal Abdel Nasser became the first native Egyptian ruler in more

than 2,000 years. In 1953 Egypt became a republic. Nasser wanted Egypt to be a leader in the Arab world. During this period tensions increased between Egypt and Israel.

Anwar el-Sadat became president in 1970. In 1973 Egypt fought another brief war with Israel, but in 1978 Sadat met with the Israeli prime minister, Menachem Begin, in the United States. The meeting led to a historic peace treaty between Egypt and Israel in 1979. Most other Arab countries were unhappy with the treaty. Muslim radicals assassinated Sadat in 1981.

Under a new president, Hosni Mubarak, Egypt's relations with other Arab countries improved. Egypt continued to work for peace in the Middle East.

► More to explore

Cairo • Egypt, Ancient • Middle East
• Nile River • Suez Canal

Facts About EGYPT



Population
(2008 estimate)
74,805,000

Area
385,229 sq mi
(997,739 sq km)

Capital
Cairo

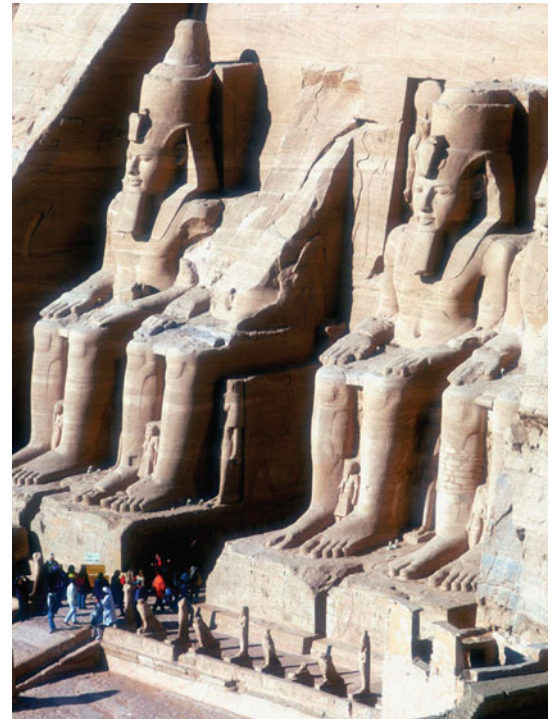
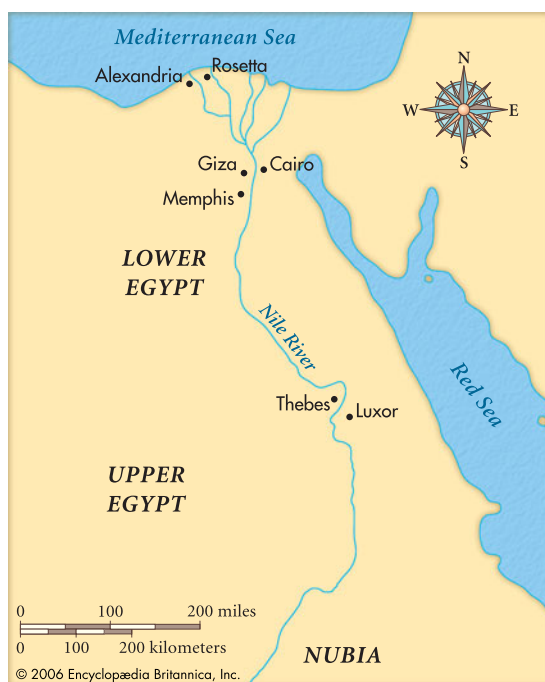
Form of government
Republic

Major cities
Cairo, Alexandria, Al-Jizah, Shubra al-Khaymah, Port Said, Suez

Egypt, Ancient

About 5,000 years ago, the civilization of ancient Egypt began in the Nile River valley of northeastern Africa. It was one of the world's first civilizations. It is also one of the most famous civilizations in history. The ancient Egyptians built huge pyramids, temples, palaces, and tombs. Their paintings and carvings are among the most splendid ever created. They also produced art with simple scenes of everyday life, work, and play that shows many details of their lives.

Egypt's dry climate has helped to preserve many of the things that the ancient Egyptians made. Archaeologists first started to uncover the remains of ancient Egypt in the late 1700s. Through those remains historians have been able to learn a great deal about the world of the ancient Egyptians.



Many ruins from ancient Egypt can still be seen today. The temple of Abu Simbel was built during the reign of Ramses II almost 3,300 years ago. It was dedicated to two sun gods.

Life in Ancient Egypt

Villages and towns of ancient Egypt were situated near the Nile River. It was the chief highway as well as the only source of water. Very little rain falls in Egypt. Rain does fall along other parts of the river, however. Every year the water from that rain flows downstream and eventually floods the lands. Afterward, as the waters flow back, they leave rich mud behind. The Egyptians planted wheat and barley in the mud. They grew other fruits and vegetables using irrigation (channels of water).

Ancient Egyptian houses were made of mud bricks. The houses had small windows and floors of straw matting. Paintings often decorated the walls.

Clothing was simple because the climate was hot. White linen, woven from the flax plant, was a common fabric. Men typically wore a skirt of linen and sometimes a vest. Women wore a straight, simple, ankle-length dress.

One of the ancient Egyptians' finest achievements was their written language. The first Egyptian writing was a system of pictures called hieroglyphics. The Egyptians were using hieroglyphics by 3100 BC. The Egyptians cut or painted the symbols on the walls of tombs and temples. Later they developed simpler, curved forms of writing. The Egyptians used these forms to write on papyrus, a paper-like material made from a plant.

The ancient Egyptians worshipped many gods. The main god of the sun was Re (or Ra). Each city had its own special gods. When the city of Thebes

grew in importance, its special god Amon did also. Eventually the Egyptians combined Amon with Re. Amon-Re was considered the king of the gods.

Osiris, a god of the dead, was another important god because the Egyptians believed in life after death. Wealthy Egyptian families stocked tombs with items that they thought dead people would use in the next life.

In addition, the Egyptians used salt and chemicals to preserve dead bodies as mummies. They even made mummies of such animals as cats, ibises, and crocodiles. Mummies of important people lay in fancy coffins called sarcophagi. The coffin of King Tutankhamen was made of solid gold.

History

Earliest Egypt

People have lived along the banks of the Nile River for at least 10,000 years. The narrow valley of the Nile was once swampy and overgrown with trees, rushes, and papyrus (a tall, reedlike plant). The people gradually cleared the swamps and built villages. They learned to plant and grow crops. Eventually, they organized two kingdoms. Upper Egypt was in the narrow river valley in the south. Lower Egypt was in the north, in the broad delta (triangular piece of land) where the river flows into the sea.

In about 2900 BC a king named Menes united the two parts of Egypt. Menes



A tomb from ancient Egypt is painted with hieroglyphics and many colorful pictures. The pictures give an idea of what people at the time looked like and what kind of clothing they wore.



Nefertiti was queen of ancient Egypt from 1353 to 1336 BC. A painted stone bust, or statue of the queen's head, can be seen in the Egyptian Museum in Berlin.

built the capital city of Memphis. The site of Memphis is near Cairo, the capital of modern Egypt.

Old, Middle, and New Kingdoms

After Menes, many kings, called pharaohs, ruled ancient Egypt. During the long history there were more than 30 dynasties, or ruling families, of pharaohs. Historians have grouped several of these dynasties into three important periods: the Old Kingdom, the Middle Kingdom, and the New Kingdom. These existed from about 2600 to 30 BC.

The Old Kingdom lasted from 2575 to 2130 BC. It was during this period that the Egyptians built their great pyramids. Near the great pyramids, the Egyptians made a huge sculpture called the Great Sphinx. The Sphinx has the face of a man and the body of a lion.

After 2130 BC Egypt suffered civil wars. The country was split up until about 1938 BC. Then the rulers of Thebes, a city far up the Nile in Upper Egypt, defeated their enemies and reunited Egypt. This began the Middle Kingdom, which lasted until 1630 BC. During this time, Egypt expanded its territory.

A second period of weakness followed the Middle Kingdom. An Asian people known as the Hyksos invaded Egypt. The Egyptians finally forced out the Hyksos by 1539 BC. This began the New Kingdom, which lasted until 1075 BC.

A mighty pharaoh of the New Kingdom was Thutmose III, who ruled from 1479 to 1426 BC. Thutmose's reign was the time of ancient Egypt's greatest power and wealth. Thutmose conquered Syria. He also ordered the building of many tombs and temples.

Later during the New Kingdom, the Hebrews (the ancestors of Jewish people) left Egypt, where they had been slaves. This event, called the Exodus, probably took place between 1279 and 1213 BC, during the reign of Ramses II.

Alexander and the Ptolemies

Peoples from Asia, first Assyrians and then Persians, later took over Egypt.

Then in 332 BC Alexander the Great of Macedonia (a country near Greece) conquered Egypt. He founded the city of Alexandria at the mouth of the Nile.

After Alexander's death, Ptolemy, one of his generals, seized the throne. In 323 BC Ptolemy founded a new dynasty of Egyptian kings, called the Ptolemies. The Ptolemies were Macedonians who spoke Greek, and many Egyptians disliked having foreign rulers.

Nevertheless, under the Ptolemies Egypt grew rich and powerful. They built the Pharos, a huge lighthouse, at Alexandria. Like the great pyramids, the Pharos was one of the seven wonders of the ancient world. The Ptolemies also built a famous library at Alexandria. Scholars came from all over the Greek-speaking world to study there.

Roman and Muslim Conquests

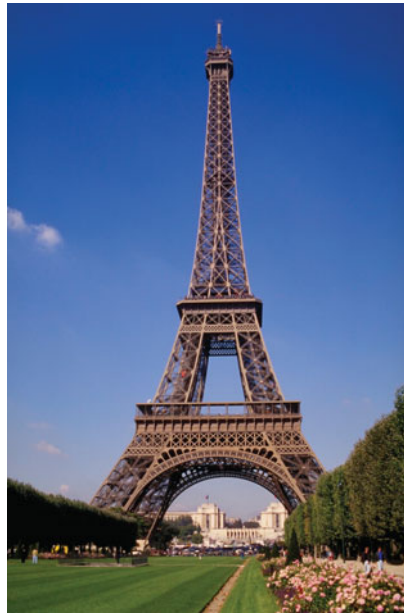
The last of the Ptolemies was Queen Cleopatra. Roman forces defeated her navy at the battle of Actium in 31 BC. In 30 BC Egypt lost its independence to Rome. After the Roman Empire split in half in the AD 300s, Egypt became a part of the eastern half, called the Byzantine Empire.

Finally, in the AD 600s Muslim Arabs took over Egypt. Egypt is still a Muslim country today.

► More to explore

Cleopatra • Egypt • Hieroglyphics
• Mummy • Nile River • Pharaoh
• Pyramid • Re • Tutankhamen

Eiffel Tower



The Eiffel Tower is the tallest structure in Paris, France.

The Eiffel Tower in Paris, France, is among the most famous landmarks in the world. Known as the Tour Eiffel in French, the tower was designed and built by the French engineer Gustave Eiffel in 1889.

The three-level tower is 984 feet (300 meters) tall. Glass-walled elevators and stairs lead up to the first and second platforms. Other elevators go from the second level to the third platform near the top. Along with viewing areas, the tower has restaurants, a museum, and a souvenir shop.

The Eiffel Tower is the result of a contest held by the French government. At the time the government was organizing a fair to celebrate the 100-year anniversary of the start of the French Revolution. Eiffel's plan was chosen from more

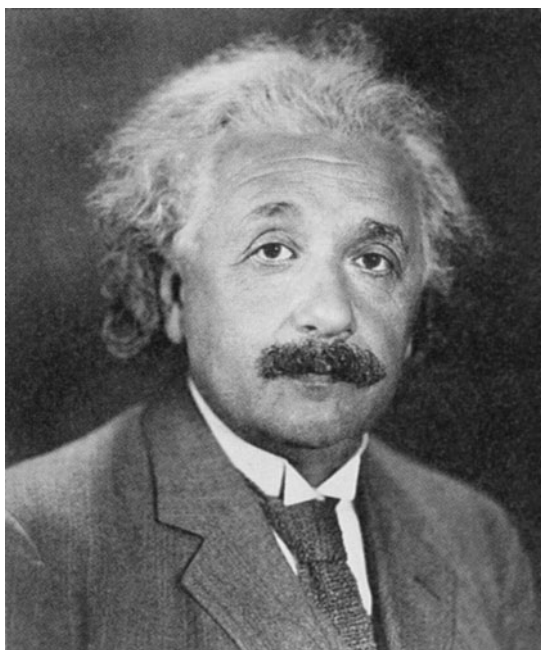
than 100 plans, though many people criticized the plan because nothing like it had ever been built before.

After the fair ended, the Eiffel Tower was almost torn down several times. But Eiffel oversaw changes to the structure that made it more useful. Among them were the additions of a weather station in 1890 and a military telegraph station in 1903. The tower is now a popular tourist attraction.

► **More to explore**
French Revolution

Einstein, Albert

Albert Einstein was one of the greatest geniuses in the history of science. He developed many theories, or ideas. These theories led to new ways of thinking about space, time, matter, energy, and gravity.



Albert Einstein

Early Life

Albert Einstein was born to Jewish parents in Ulm, Germany, on March 14, 1879. He did not do well in school, but he did take an interest in mathematics and science. While at college, he studied physics and math. After graduating in 1900, he worked in a government office. Meanwhile, he continued studying physics on his own.

Scientific Breakthroughs

In 1905 Einstein caused a stir by publishing five major research papers. These papers forever changed the way people thought about the universe. One of these papers contained completely new ideas about the properties of light. Einstein received the Nobel prize for physics in 1921, mainly for the work in this paper.

In another paper, Einstein presented what is now called the special theory of relativity. This theory states that measurements of space and time are relative. That is, they change when taken by people moving at different speeds. This idea was entirely new. The special theory of relativity also changed how scientists thought about energy and matter. (Matter is everything that takes up space.)

Later Years

When the Nazi Party took over Germany in 1933, Einstein left the country. He eventually settled in the United States.

During World War II Einstein urged the United States to build nuclear weapons.

He felt that these weapons might be needed to defeat the Nazis. The United States did create the first atomic bomb in 1945. Einstein, however, did not work to develop the bomb. After World War II he tried to prevent any future use of atomic weapons. Einstein died in Princeton, New Jersey, on April 18, 1955.

► More to explore

Energy • Matter • Nuclear Energy
• Physics • Time • Universe

Eisenhower, Dwight D.

A famous general during World War II, Dwight D. Eisenhower became the 34th president of the United States in 1953. Eisenhower's two terms in office were a time of peace and prosperity.



Dwight D. Eisenhower

Early Life

Dwight David Eisenhower was born in Denison, Texas, on October 14, 1890. He was the third of the seven sons of David Jacob Eisenhower and Ida Elizabeth Stover. Dwight spent most of his childhood in Abilene, Kansas. He graduated from the U.S. Military Academy at West Point, New York, in 1915. In 1916 he married Mamie Geneva Doud. They had two sons.

Military Career

During World War I Eisenhower commanded a tank training center. After the war he served in the United States, the Panama Canal Zone, Europe, and the Philippines. He also was an aide to General Douglas MacArthur.

During World War II Eisenhower commanded the U.S. forces in Europe. He also led attacks in North Africa. In December 1943 Eisenhower became supreme commander of the Allied forces. He led the invasion of France on D-Day, June 6, 1944. That year Eisenhower gained the highest U.S. military rank, five-star general.

After the war Eisenhower served as Army chief of staff until 1948. In 1950 he was named the first head of the armies of the North Atlantic Treaty Organization.

Presidency

In 1952 Eisenhower won the Republican Party's presidential nomination. His vice presidential running mate was Senator Richard M. Nixon. In the election

Did You Know?

Eisenhower was called Ike from an early age. His presidential campaign slogan was "I like Ike."

that November, Eisenhower easily defeated the Democratic candidate, Adlai E. Stevenson.

As president, Eisenhower helped to end the Korean War in 1953. He tried to ease the problems that had developed between the United States and the Soviet Union since the end of World War II. He also called for lower taxes and less government control over the economy.

Eisenhower suffered a heart attack in 1955. He recovered quickly, though, and decided to seek a second term. In the 1956 election he defeated Stevenson again.

Eisenhower now faced serious problems at home and abroad. At home his biggest challenge was the integration of schools. Some people thought that African American students should not be allowed to attend the same schools as white students. In 1954 the Supreme

Court had said they should be allowed to attend the same schools. But in 1957 the governor of Arkansas kept nine African American students from entering a high school in Little Rock. Eisenhower sent federal troops to protect the students from angry whites.

Also in 1957 the Soviet Union launched the first artificial satellite, Sputnik 1, into space. The United States raced to put its own satellite, Explorer 1, into orbit in 1958. That year Eisenhower approved the creation of the National Aeronautics and Space Administration (NASA).

Hoping to improve relations with other countries, Eisenhower toured many parts of the world. In 1959 he welcomed Soviet premier Nikita Khrushchev to the United States. After the Soviets shot down a U.S. spy plane over Soviet territory, however, Eisenhower did not make his planned visit to the Soviet Union.



TIMELINE

Eisenhower is born in Denison, Texas.

October 14, 1890

Eisenhower is elected president.

1952

The leader of the Soviet Union meets with Eisenhower in the United States.

1959

Eisenhower dies in Washington, D.C.

March 28, 1969

Eisenhower gains command of the Allied forces in Europe during World War II.

1943

Eisenhower forces Little Rock, Arkansas, to allow black students into an all-white school.

1957

Eisenhower's second term ends.

1961

Retirement

Eisenhower's vice president, Nixon, lost to John F. Kennedy, a Democrat, in the election of 1960. The following January Eisenhower retired to his farm in Gettysburg, Pennsylvania. He died of heart failure in Washington, D.C., on March 28, 1969.

► More to explore

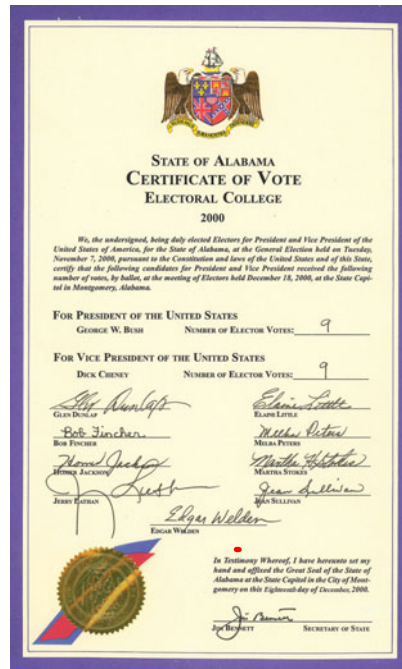
Kennedy, John F. • Korean War • Nixon, Richard M. • North Atlantic Treaty Organization • United States • World War II

Electoral College

Every four years, millions of citizens vote for president and vice president of the United States. But the citizens' votes (called popular votes) do not directly elect these leaders. Their votes actually elect the 538 members of a group called the electoral college. The electoral college then elects the president and vice president.

How Electors Are Chosen

The electoral college is organized by states. Each state gets a certain number of electors—the people who vote in the electoral college. A state's number of electors equals its number of senators and representatives combined. Every state has two senators. The number of representatives is based on the population of the state, though every state has at least one representative. In addition, the District of Columbia (Washington, D.C.) gets three electors.



A certificate from Alabama shows the signatures of the state's electors in 2000. The nine electors voted for George W. Bush.

The United States has two main political groups, or parties (the Democrats and the Republicans). Each political party chooses a candidate for president and a candidate for vice president. In each state, each party also chooses a group, or slate, of electors. The electors promise to vote for their party's candidates. When citizens vote for the candidates of one party, they are actually choosing that party's electors for their state.

In most states, the party that wins the most popular votes sends all its electors to vote in the electoral college. (Maine and Nebraska choose electors slightly differently.) The electors for every state then vote for their party's candidates. The candidates with the most electoral

Did You Know?

All the electors do not meet in one place to vote. Instead, every state has its own gathering.

votes become president and vice president.

History

The electoral college came about partly because the people who wrote the U.S. Constitution did not trust the common voters. In most elections there have been few complaints about the process. Usually, the candidates who win the most popular votes also win the most votes in the electoral college. But this is not always so. In the 2000 election, more citizens voted for Al Gore than for George W. Bush. However, Bush became president. This happened because Bush's party won in enough states to send the most electors to the electoral college. Besides Bush, two other U.S. presidents have been elected with fewer popular votes than their opponents. They were Rutherford B. Hayes in 1876 and Benjamin Harrison in 1888.

► More to explore

Political Party • United States Constitution

Electricity

Electricity is a form of energy. It can be seen in nature in a bolt of lightning. Scientists have also learned how to generate, or create, electricity. This is useful because electricity that is generated can be controlled and sent through wires. It can then power such things as heaters, lightbulbs, and computers. Today electricity provides most of the energy to run the modern world.

How Electricity Works

Everything in the universe is made of tiny particles called atoms. Each atom has even tinier particles called protons and electrons. An electron has what is called a negative charge. A proton has a positive charge. Positive and negative charges try to move close together. However, two positive charges, or two negative charges, will push each other away. Electricity results when electrons are pushed and pulled from atom to atom.

Static Electricity

The electrons can be moved by actually rubbing one object against another. This creates something called static electricity. Static electricity explains why rubbing a balloon against one's hair can make the hair stand on end. The electrons move from the balloon to the hair. Because the hairs then all have the same kind of charge, they try to fly away from each other.

Generating Electricity

Many moving electrons are called an electric current. A city's power plant



Electricity in the form of lightning brightens the sky above a city.



Static electricity makes a child's hair stand on end.

produces a powerful electric current and sends it through wires. The electricity used for lighting, heating, and running appliances is made by machines called generators. Generators cause a current to flow by moving a magnet past a coil of wire.

Wires then carry the current to houses and other buildings. More wires connect to the power outlets in rooms. When a person plugs in an iron, hair dryer, or another electric device, the current travels into the device. The current then makes the device work. A chemical reaction in a battery can also produce an electric current.

History

The ancient Greeks were the first to study electric forces. In the American colonies during the 1700s, Benjamin Franklin performed experiments that proved that lightning is a form of elec-

tricity. Scientists later learned that electricity is related to magnetism. They then learned how to generate electricity using magnets.

► More to explore

Atom • Battery • Energy • Magnet and Magnetism

Electronic Games

Electronic games are games run by computer technology. They are also called video games. People play electronic games on personal computers, in video arcades, and on home electronic game systems. The home systems are called consoles. Console games are played using a handheld device usually connected to a television. People may play electronic games alone or with others.

How Electronic Games Work

All electronic games begin as computer instructions called software. A computer



Some electronic games are small and can be held in the hand.

programmer writes the software commands to make the game run. The game software is then loaded onto hardware—a computer or a console.

Inside the computer or the console, hardware and software work together to send electronic signals through the system. These signals create the game's sounds and images. The player controls the action of the game using a paddle, a joystick, or a keypad.

Did You Know?

Other early arcade video games that were popular include Ms. Pac-Man, Donkey Kong, Centipede, Asteroids, and Frogger.

History

Electronic games began as very simple programs with poor graphics and no sound. A man named William A. Higginbotham created one of the first electronic games, called *Tennis for Two*, in 1958.

The first arcade game, called *Computer Space*, came out in 1971. More successful arcade games soon followed—for example, *Pong*, *Space Invaders*, and *Pac-Man*. The first electronic game system for home use appeared at about the same time.

In 1977 a company called Atari released a home system with removable cartridges. Each cartridge held a different game. With this system electronic games grew in popularity. But people wanted better graphics and sound.

Seeing the demand, many other companies began developing home electronic games as well. The quality of the games' sound and images steadily improved. The technology used to run the games also improved.

Nintendo was the first company to provide a keypad with its consoles rather than just a joystick. Today Nintendo, Sony, and Microsoft are some of the leading makers of electronic games and game systems.

Game companies continue to add new features to their games. Some systems now let players play together over telephone lines. Electronic gaming has become one of the most popular forms of entertainment in the world.

► More to explore

Computer • Electronics

Electronics

Electronics is a branch of the science called physics. It explains how electricity can be used to carry or process information. Many products are based on electronics. They include computers, digital cameras, radios, television sets, wireless telephones, and video games. Often these products themselves are called electronics.

Electric Signals

Electronic products contain devices that control the flow of electricity. A flow of electricity is called an electric current. Changes in electric currents create electric signals. Electric signals can provide different kinds of information. For example, electric signals in a radio provide sound.

Many electronic products use electric signals to provide information as a number code. These products are called digi-



A worker puts together an integrated circuit, or microchip. Microchips allow electronic products to work quickly and to be small in size.

tal electronics. A digital camera is an example. It changes a picture into many tiny dots and uses electric signals to create numbers that describe each of the dots. Another digital electronic product, such as a computer or a printer, can also read those numbers. They can use the numbers to re-create the picture and print it or display it on a computer screen.

Electronic Devices

Most electronic devices, including computer chips and transistors, are made from silicon. Silicon is a type of material called a semiconductor. A semiconductor lets electricity flow through it only under certain conditions. This property makes it useful for controlling the flow of electricity.

One of the most common electronic devices is the transistor. It controls the flow of electricity by acting as a switch that can be turned on and off. Transis-

tors can be very small. Millions of tiny transistors can be combined into one device called an integrated circuit. This allows electronic products to work with a large number of electric signals very quickly.

► More to explore

Computer • Electricity • Physics

Element

► see Chemical Element.

Elephant

Elephants are the largest living land animals. There are three species, or kinds: the African savanna elephant, the African forest elephant, and the Asian elephant. They make up the elephant family of mammals. Mammoths and



African elephants are the largest of all living land animals.



An Asian elephant bathes in the Kabani River in India.

mastodons also belonged to this family, but they are now extinct.

Where Elephants Live

Elephants live mainly in forests and grasslands in warm areas. African elephants live in Africa. The Asian elephant lives in India, Sri Lanka, Malaysia, Indonesia, Thailand, and Vietnam.

Physical Features

Elephants' skin is thick, wrinkled, and not very hairy. It is grayish to brown in color. An elephant's trunk is an extension of the nose and upper lip. An elephant uses its trunk to grab food and to put it into the mouth. It can also draw water into the trunk and then blow it into the mouth.

An African elephant has larger ears and a slightly larger body than an Asian elephant. African elephants may stand up to 13 feet (4 meters) at the shoulder.

The Asian elephant may reach about 11.5 feet (3.5 meters) at the shoulder.

Male African and Asian elephants usually have two tusks, which are long upper teeth. Female African elephants have tusks, too, but most female Asian elephants do not.

Behavior

Elephants migrate, or travel, in search of food. They eat only plants, including grasses. They often rest during the hottest hours of the day. They lie down to sleep for only a few hours at night.

Elephants move around in small family groups led by older females, called cows. A family group has two to eight animals. Several groups form a herd. A herd includes as many as 20 to 40 cows and all their babies. Cows are very protective of the young in their herd. At about age 4, the male young move away from the herd. They join separate groups of males, called bulls.

Life Cycle

A baby elephant is born about 22 months after mating. A newborn elephant is about 3 feet (1 meter) tall and weighs about 220 pounds (100 kilograms). An elephant may live for 60 to 70 years.

Elephants and Humans

Humans have used elephants for transportation and as work animals since ancient times. People in Asia still use elephants for these purposes today. In

addition, trained elephants appear in circuses throughout the world.

However, human activities have endangered the survival of wild elephants. Humans have destroyed many elephant habitats. Humans also have killed many elephants for the ivory of their tusks. Humans carve this ivory into works of art, jewelry, and other objects.

► More to explore

Endangered Species • Mammal
• Mastodon and Mammoth

El Greco

► see Greco, El.

Elizabeth I

Elizabeth I was queen of England for almost 45 years. During that time her



Elizabeth I

country became very powerful. Her reign is remembered as the Elizabethan Age.

Early Life

Elizabeth was born in Greenwich, England, on September 7, 1533. Her father was King Henry VIII. Her mother, Anne Boleyn, was the second of Henry's six wives. Henry had Anne Boleyn put to death when Elizabeth was only 3 years old.

Elizabeth had an older half sister named Mary and a younger half brother named Edward. Edward became king in 1547 and died in 1553. Mary then became queen. Henry, Edward, and Elizabeth were Protestant, but Mary was Roman Catholic. She made Catholicism the national religion and put Elizabeth in prison for a time.

Reign

Mary died in 1558, and Elizabeth was crowned queen of England. She was 25 years old. She had received a good education and was well prepared to rule. Many men wanted to marry her, but she stayed single. This gave her more power, but it also put her cousin Mary Stuart next in line for the throne. Mary Stuart, also known as Mary Queen of Scots, was a Catholic. Elizabeth kept her in prison for many years and then had her killed in 1587.

During the first 30 years of Elizabeth's reign, England built up its sea power. English ships sailed across the Atlantic Ocean to the West Indies and challenged Spain for control over trade.

Did You Know?

Elizabeth's family name was Tudor. She was sometimes called Good Queen Bess.

English sea captains raided Spanish ships, and Elizabeth took a share of the treasure they seized.

King Philip II of Spain struck back in 1588. He sent a great fleet called the Armada to attack England. The queen's ships defeated the Armada. That victory was a high point of Elizabeth's reign.

During the 1590s Elizabeth began to suffer from ill health. She died on March 24, 1603. Mary Stuart's son, James VI of Scotland, became king of England.

► More to explore

Armada, Spanish • Henry VIII

Elizabeth II

At the age of just 25, Elizabeth II became queen of the United Kingdom of Great Britain and Northern Ireland.



Elizabeth II

She came to the throne after the death of her father, King George VI, in 1952.

Elizabeth Alexandra Mary was born in London, England, on April 21, 1926. Her father was the second son of King George V, who died in 1936. George V's oldest son reigned as King Edward VIII for only a short time. Then he surprised the world by giving up the throne. Elizabeth's father took over as King George VI. As a result, the 10-year-old Elizabeth became next in line for the throne. The young princess began training for her future duties. She also studied history, languages, and music at home. In 1940 she gave her first radio address.

Elizabeth married Philip Mountbatten in 1947. Before the marriage he gained several special titles, including the duke of Edinburgh. Their first child, Prince Charles, was born in 1948. Their younger children are Princess Anne, born in 1950; Prince Andrew, born in 1960; and Prince Edward, born in 1964. Their family name is Windsor.

On February 6, 1952, King George VI died. Elizabeth became Queen Elizabeth II. Her coronation, or crowning ceremony, took place on June 2, 1953.

As queen, Elizabeth does not control the British government. Instead, she serves as a symbol of her country at ceremonies and public events in Britain and around the world.

► More to explore

United Kingdom

Elk



A male American elk, or wapiti, lifts his head to sound a call.

The term elk refers to different animals in different parts of the world. In Europe it is used for the mammal known in North America as the moose. The name is also used for several large deer, notably the animal sometimes called the American elk in North America. The American elk is more properly named the wapiti.

► More to explore

Deer • Moose • Wapiti

Ellis Island

Ellis Island was once the first place that many people saw when they moved to the United States from other countries. People who go to a new country to live are called immigrants. Throughout its history the United States has welcomed many immigrants. Many of them arrived by boat at Ellis Island. The island is located in the bay near New York City.

Before 1890 the states handled immigration. Then the U.S. government took over. It built the immigration center on Ellis Island at a time when many people wanted to live in the United States. More than 12 million people passed through the center from 1892 to 1924. The busiest year was 1907, when 1.25 million people passed through.

On Ellis Island, doctors and inspectors examined the immigrants. They checked for disease and wrote down information about each person. Then they decided who could stay in the United States. Most people passed the tests and went on to New York City after a few hours. Others failed their examinations. Some had serious diseases. Others were seen as troublemakers. These people waited on the island for a ship to take them back home.

In 1924 Congress passed a law that made it harder to immigrate to the United States. Those who did come passed through other places. Ellis Island mainly held people who were having



Ellis Island covers only about 27 acres (11 hectares), but it used to be even smaller. It was built up with boatloads of rocks and dirt.



Immigrants at Ellis Island in the early 1900s wait to have a physical examination. Doctors and inspectors decided who was healthy enough to be allowed to stay in the United States.

immigration problems. In 1954 the center on Ellis Island closed. In 1976 the island became a tourist center, and in 1990 the immigration center reopened as a museum. Today many people visit Ellis Island on their way to the nearby island that has the Statue of Liberty.

► More to explore

Liberty, Statue of • United States

Elm

Several species, or types, of tree belong to a family of plants called the elm family. Large numbers of elms used to grow in cities. During the 1900s, however, a disease killed many elms.

Elms grow mainly in the Northern Hemisphere. North American elms include the American elm; the slippery, or red, elm; the rock, or cork, elm; the winged, or wahoo, elm; and the cedar elm. The English elm and the Wych elm

are European species. Asian elms include the Siberian elm and the Chinese elm.

Elms are often about 50 to 70 feet (15 to 21 meters) tall. But some types may grow higher than 100 feet (30 meters). The leaves of elms are toothed, which means that they have jagged edges. The flowers do not have petals. They grow in clusters. The fruits, called samaras, are flat disks that each hold one seed.

People often plant elms because they grow quickly into beautiful shade trees. People use elm wood to make boats, farm buildings, or furniture.

Dutch elm disease has killed many North American and European elm trees. A fungus carried by beetles causes this disease.

► More to explore

Tree



An American elm provides much shade.

El Salvador

El Salvador is the smallest of the seven countries in Central America. It is also the most crowded. Its capital is San Salvador.

Geography

The Pacific Ocean forms El Salvador's southern border. The country shares land borders with Guatemala and Honduras. El Salvador has two mountain regions with volcanoes. Lowlands along the coast are generally hot and humid. Temperatures are cooler in the mountains.

Plants and Animals

Balsa, cedar, mahogany, coconut, mango, and palm trees grow in El Salvador. However, many of its forests have been cleared to make room for farming. Wilderness preserves protect spider monkeys, anteaters, mountain lions, and hummingbirds.



People

Nearly 90 percent of El Salvadorans are mestizos, or people with mixed American Indian and European roots. Most other people are Indians, including the Izalco and the Pancho. Spanish is the main language. Most people practice Roman Catholicism. More than half of the population lives in cities.

Economy

El Salvador's economy is based on manufacturing and farming. Factories produce mainly food products and clothing. Clothing and coffee are the most important exports. Sugarcane and corn are other important crops.

History

The Pipil Indians probably arrived in what is now El Salvador about 1,000 years ago. The Spanish reached the region in 1524 and defeated the Pipil by 1539. Spain ruled the land as a part of Guatemala until 1821. In 1823 El Salvador joined the United Provinces of Central America, a union of five states formerly ruled by Spain. When the union broke up, El Salvador became independent in 1840.

Decades of political violence grew into civil war by the end of the 1970s. Government and rebel leaders finally signed a peace treaty in 1992.

► More to explore

Central America • San Salvador



Facts About EL SALVADOR



Population
(2008 estimate)
5,794,000

Area
8,124 sq mi
(21,042 sq km)

Capital
San Salvador

Form of government
Republic

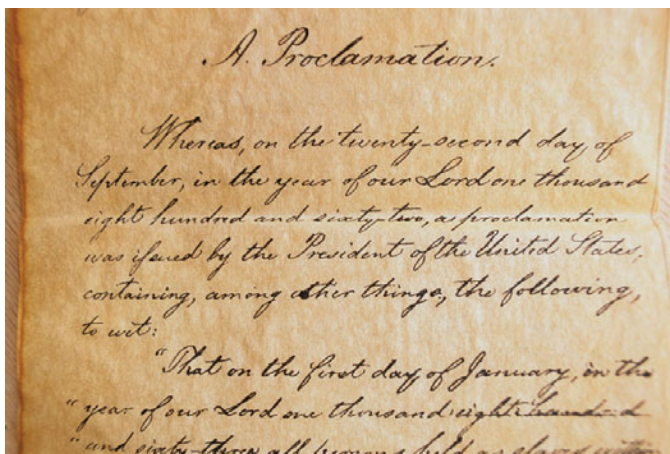
Major cities
San Salvador,
Soyapango,
Mejicanos, Santa
Ana, San Miguel

Emancipation Proclamation

The American Civil War pitted Southern states against Northern states. One of the major issues was whether the Southern states should be allowed to continue owning slaves. During the war, President Abraham Lincoln issued the Emancipation Proclamation. This document, issued on January 1, 1863, declared that the slaves in the Southern states were free.

The president could not really enforce the proclamation in places that were still controlled by Southern troops. Even so, the proclamation was important because it made the American Civil War a fight about slavery.

The proclamation also opened the U.S. Army to freed African Americans. As soon as the Northern armies captured a region, the slaves there were given their freedom. Nearly 180,000 of them joined the Northern forces. They were very



President Abraham Lincoln called the Emancipation Proclamation "the greatest event of the 19th century."

helpful in bringing about the final surrender of the Southern forces in 1865. After the war, the 13th Amendment to the U.S. Constitution ended slavery throughout the United States.

► More to explore

American Civil War • Lincoln, Abraham
• Slavery

Empire

Throughout history countries have wanted to control lands beyond their borders. This practice is called imperialism, and the lands that they control are called an empire. The ruler of an empire is sometimes called an emperor. Countries build empires mainly to get power or wealth.

Building Empires

Sometimes a ruler builds an empire by taking over nearby lands. One famous empire of this type was the Roman Empire of ancient times. The Romans spread their power from the city of Rome to lands in Europe, North Africa, and western Asia.

An empire may also consist of lands far from the controlling country. Sometimes a country sends people to live in a new place overseas. The settlements that those people set up are called colonies. In the 1600s, for example, England sent people to set up colonies in eastern North America. Those colonies eventually became the United States.

Sometimes, instead of sending many settlers, a country sends only a few



Great Britain ruled land all over the world from about the 1600s to the 1900s. A map shows the huge size of the British Empire in the late 1800s. The British lands are shown in orange.

people to govern the new place. Those places are often called colonies as well. In the 1800s, for example, European countries seized control of most of Africa. In most cases only a small number of Europeans went to the colonies in Africa. They oversaw the government of the colonies. They also set up businesses and controlled trade. Sometimes the European colonizers forced the Africans to work for them.

Effects of Empires

Imperialism has had a great influence on world history. It has led to the discovery and development of new lands. Imperial powers have built useful things such as roads, schools, and hospitals. Imperialism has also spread knowledge and culture. In many places that were once colonies, the people still speak the language of the colonizers. The religions of colonial powers are also common in former colonies.

Imperialism has also had many negative effects. Imperial powers killed many native people in wars of conquest. They made other native people work for low wages or as slaves. They also often forced the people to give up their traditional way of life.

History

The Phoenicians were among the earliest colonizers. About 3,000 years ago they set up trading posts along the eastern coast of the Mediterranean Sea, in North Africa, Anatolia (now Turkey), and Cyprus. Later the Assyrians, the Persians, the Greeks, and the Romans had empires in the region. The Roman Empire reached all the way from Britain to Egypt.

Imperialism also happened in Asia. The first empire in India was established in the 300s BC. In China the Qin Dynasty created the first empire in 221 BC.

After the fall of the Roman Empire in the AD 400s, no European country was



The Romans built Hadrian's Wall across Great Britain in ancient times. It included a long stone wall and forts to keep invaders out of the Roman colony in Britain.

strong enough to establish colonies. Between the 600s and the 1200s Arabs built up an empire in western Asia, North Africa, and Spain. They spread their religion, Islam, to the places they conquered.

In the late 1400s European explorers first crossed the Atlantic Ocean to the Americas. That began a great age of exploration. Soon European countries began claiming land in the Americas, India, and the East Indies. England, France, Spain, Portugal, and the Netherlands had many colonies.

Most colonies in North and South America gained freedom between 1776 and 1826. But at the same time European countries started building empires in Africa. In the 1880s European powers

divided up almost all of Africa between themselves.

In the late 1800s and early 1900s the United States and Japan became colonial powers. The United States took control of islands in the Caribbean Sea and the Pacific Ocean. Japan conquered lands in East Asia. Imperialism by Japan, Italy, and Germany in the 1930s led to World War II. After the war the Soviet Union built an empire in eastern Europe.

The large empires of the past no longer exist. Between 1945 and 1990 about 100 colonies gained their freedom. Sometimes this happened peacefully, with the colonial power stepping aside. Other times the people of the colonies fought for independence.

► More to explore

Africa • Americas, Exploration and Settlement of the • Colony • Greece, Ancient • Phoenician • Rome, Ancient

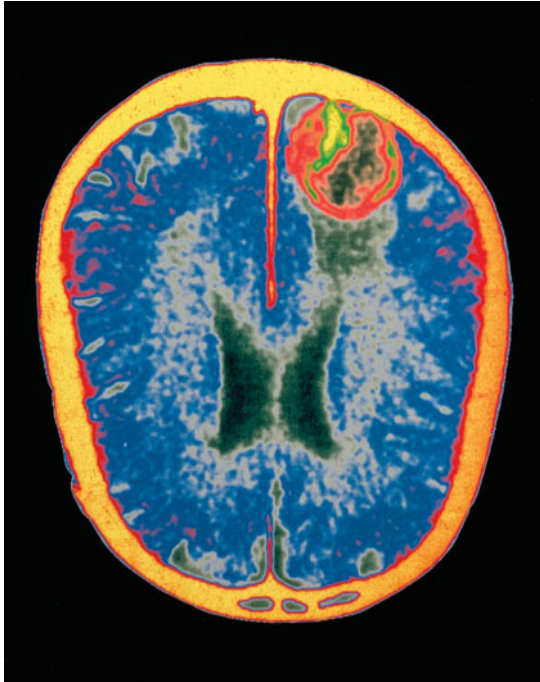


Great Britain gave Hong Kong back to China in 1997. Hong Kong was the last major colony of the British Empire. Members of the Chinese military attend a ceremony marking the peaceful return of the colony.

Encephalitis

Encephalitis is an inflammation, or swelling, of the brain. It is often a mild illness, but serious cases can cause brain damage.

Particles called viruses or such tiny living things as bacteria and parasites can cause encephalitis. So can harmful chemicals. Viruses are the most common cause. The viruses that cause chicken pox, mumps, and measles can turn into encephalitis. These viruses spread from person to person. Mosquitoes and other biting insects also spread viruses. Some



An X-ray photograph shows encephalitis on the right side of a brain.

of these viruses, such as West Nile virus, can cause encephalitis.

Encephalitis has a wide range of symptoms, or signs. These include fever, headache, tiredness, a stiff neck, and vomiting. In the most severe cases people may fall into a coma. A coma is a deep, heavy sleep. Recovery in severe cases can take weeks. There may be damage to the brain that cannot be fixed.

Doctors use medicines to fight the causes of encephalitis and to ease its symptoms. The best way to prevent encephalitis is to stop the spread of the things that cause it. Washing hands helps to kill viruses and bacteria. Insect repellent helps to keep insects from biting. Vaccines prevent many illnesses that can cause encephalitis. Vaccines are sub-

stances given to healthy people that help the body fight disease.

► More to explore

Brain • Virus

Endangered Species

An endangered species is any type of plant or animal that is in danger of disappearing forever. If a species, or type, of plant or animal dies out completely, it becomes extinct.

How Plants and Animals Become Endangered

Animals and plants depend on each other and their environment to survive. When their environment, or habitat, changes or disappears, plants and animals may become endangered. Natural



The California condor was hunted and poisoned until it became an endangered species. Now it is protected by law.

disasters or changes in the climate can harm or destroy habitats.

Humans can cause species to become endangered as well. Humans pollute habitats with garbage, car fumes, and factory wastes. They destroy habitats by clearing land for roads, buildings, and farms. They also may hunt and kill too many of certain types of animals.

The arrival of a new species in a habitat is another threat. Often the new species spreads freely because it has no natural enemies. The species already in the habitat may not be able to compete against the newcomer. For example, mongooses brought to Jamaica in the 1800s killed many native animals.

Endangered Species Today

The list of endangered animals includes many large, well-known mammals. The tiger and both African and Asian elephants are endangered. Several types of whale are also endangered. The giant panda survives only in remote parts of China and in zoos.

Endangered birds include several types of crane, eagle, and parrot. Among the endangered reptiles are several types of sea turtle—for example, the leatherback turtle. There are also endangered amphibians, fishes, mollusks, insects, and other animals.

Endangered plant species range from tiny mosses to towering trees. The mandarin tree is an endangered shrub with bright red flowers. Foreign species of plant have been taking over its habitat

on the island of Mauritius. In the early 21st century fewer than 50 of these plants were growing in the wild. Another endangered plant, the Bermuda cedar tree, grows in the wild only in Bermuda. People have cut down many of these trees to build houses, ships, and furniture.

Protection

In the 1960s people became aware that many species were endangered. Today many countries have made it illegal to harm, capture, kill, or sell endangered species. In addition, many organizations work to keep endangered species from becoming extinct. The International Union for Conservation of Nature and Natural Resources keeps lists of endangered species. The Nature Conservancy and the World Wildlife Fund help to set aside land for threatened wildlife. Nature preserves and zoos help endangered animals to reproduce. Such programs have helped to increase the populations of the black-footed ferret, the California condor, and other endangered animals.

► More to explore

Animals, Extinct • Conservation
• Environment • Habitat

Endocrine System

In the human body, a group of organs called glands make up the endocrine system. Glands make hormones. These are chemicals that help control activities of the body. Insects, fish, amphibians,

Did You Know?

One endangered species that was saved from extinction is a bird called the whooping crane. In 1937 fewer than 20 remained. Now there are several hundred.

reptiles, birds, and mammals all have endocrine systems.

Glands

The glands of the human endocrine system make more than 20 major hormones. The hormones travel in the blood to cells throughout the body. A part of the brain called the hypothalamus helps to control the release of many hormones.

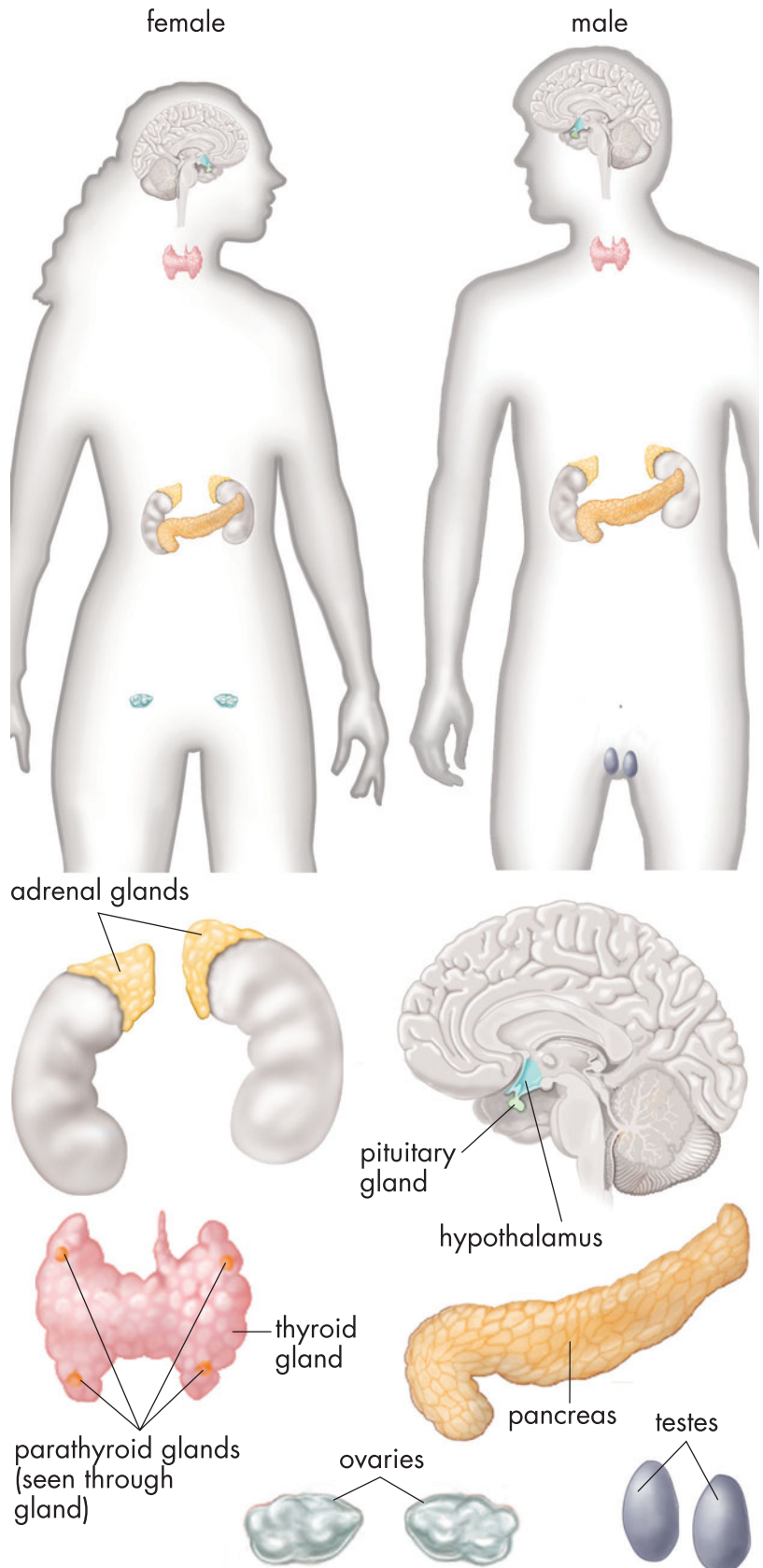
The major glands of the endocrine system include the pituitary, thyroid, and adrenal glands, as well as the pancreas. The ovaries are glands found only in women. Men have glands called testes.

Pituitary Gland

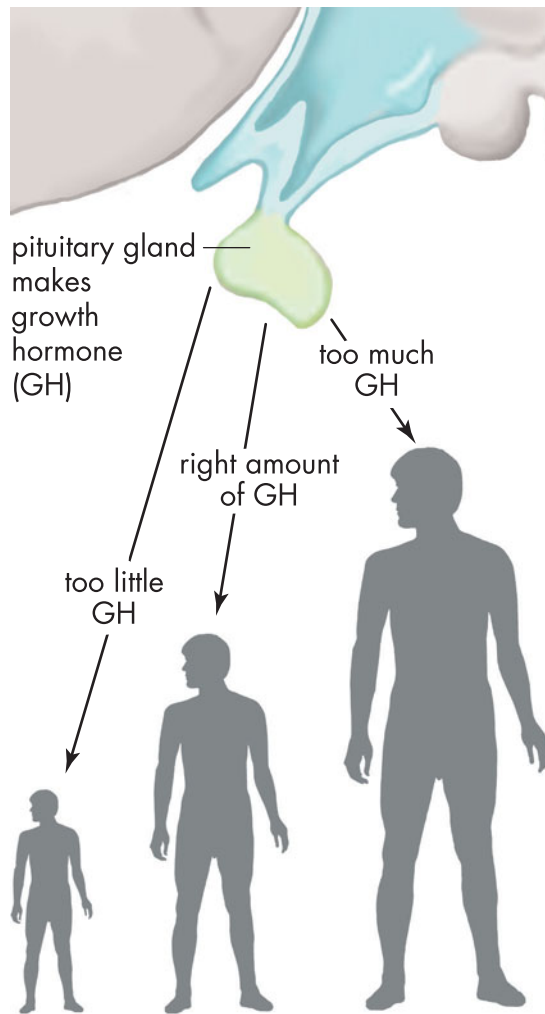
The pituitary gland is a bean-sized gland at the base of the brain. It sits beneath the hypothalamus. The pituitary gland makes hormones that control many body functions. One hormone controls the growth of the body. Another helps women deliver babies and helps produce milk so that women can nurse their babies. Other hormones made by the pituitary gland control how other endocrine glands work.

Thyroid and Parathyroid Glands

The thyroid gland is located at the base of the neck. It produces a hormone that controls how fast cells burn food to release energy. Four parathyroid glands are attached to the thyroid gland. They make a hormone that helps control the amount of calcium in the blood. Calcium is an important mineral that helps bones to grow.



Most glands of the endocrine system are found in both women and men. Only women have ovaries. Only men have testes.



One of the hormones made by the pituitary gland controls the growth of the body.

Adrenal Glands

One adrenal gland sits on top of each kidney. The two adrenal glands are divided into two main parts. One part produces hormones that do many jobs. For example, they control the mixture of salt and water in the body. The other part makes hormones that raise blood pressure and heart rate when the body is under stress.

Pancreas

The pancreas is located just behind the stomach. This gland produces two important hormones called insulin and

glucagon. They work to keep the right amount of sugar in the blood.

Ovaries and Testes

Ovaries sit in the pelvis, or lower belly, of females. They make hormones that cause breasts, wide hips, and other female features to develop. Testes sit in a pouch behind the penis in males. They make hormones that cause a deep voice, facial hair, and other male features to develop. In addition to hormones, ovaries produce female sex cells, or eggs, and testes make male sex cells, or sperm. For this reason, ovaries and testes also belong to the reproductive system.

Problems with the Endocrine System

Diseases of the endocrine system cause the glands to make too much or too little of a hormone. One type of the disease called diabetes happens when the pancreas does not produce enough insulin. If the pituitary gland does not make the right amount of growth hormone, children will grow too much or too little.

Problems with the thyroid gland can cause many symptoms. Too much thyroid hormone in the blood causes weight loss, a high heart rate, nervousness, sweating, bulging eyes, and a swelling in the neck. Too little thyroid hormone causes weight gain, a slow heart rate, dry skin, and a feeling of tiredness.

► More to explore

Diabetes • Hormone • Pancreas

Energy

Energy is another word for power. Energy makes things move. It makes machines work. Energy also makes living things grow.

Types of Energy

Energy exists in many different forms. Animals get energy from eating food. Electrical energy is associated with the tiny units called atoms that make up everything in the universe. The energy is created when particles called electrons move from one atom to another. Heat and light are also forms of energy. One form of energy can also be transferred into another. Through a battery, stored chemical energy changes into electric energy. In a lightbulb, electric energy changes to light and heat.

Each of these forms of energy can be described as either potential energy or kinetic energy. Potential energy is stored energy. An object with potential energy has the ability, or potential, to move. Potential energy comes from the position or the shape of an object. For example, potential energy is stored in a rock perched on a cliff and in an arrow stretched back on a bowstring. If the cliff crumbles under the rock, the rock falls. If the string is let go, it moves forward and pushes the arrow through the air.

As the rock and the arrow move, they gain kinetic energy. Kinetic energy is the energy of moving things. All moving objects have kinetic energy—even atoms.



Wind turbines in California produce electricity.

Sources of Energy

The sun is the source of almost all energy on Earth. The sun makes plants grow. When animals eat the plants they gain energy from the chemicals that make up the plants. When plants die they decay, or break down. Over millions of years this process creates what are called fossil fuels. Fossil fuels include petroleum, natural gas, and coal. These are used to run factories, heat homes, and power automobiles.

Fossil fuels pollute the atmosphere when they are used. They are also being used up very quickly. Scientists therefore have tried to find other sources of energy to replace the fossil fuels. Some of these sources have been used directly for many years. These include wind, water, and heat from Earth. Sailboats harness the power of the wind to move them along. Water mills use water flowing through rivers to turn wheels that grind grain. In ancient times some people used hot water and gases from Earth to heat

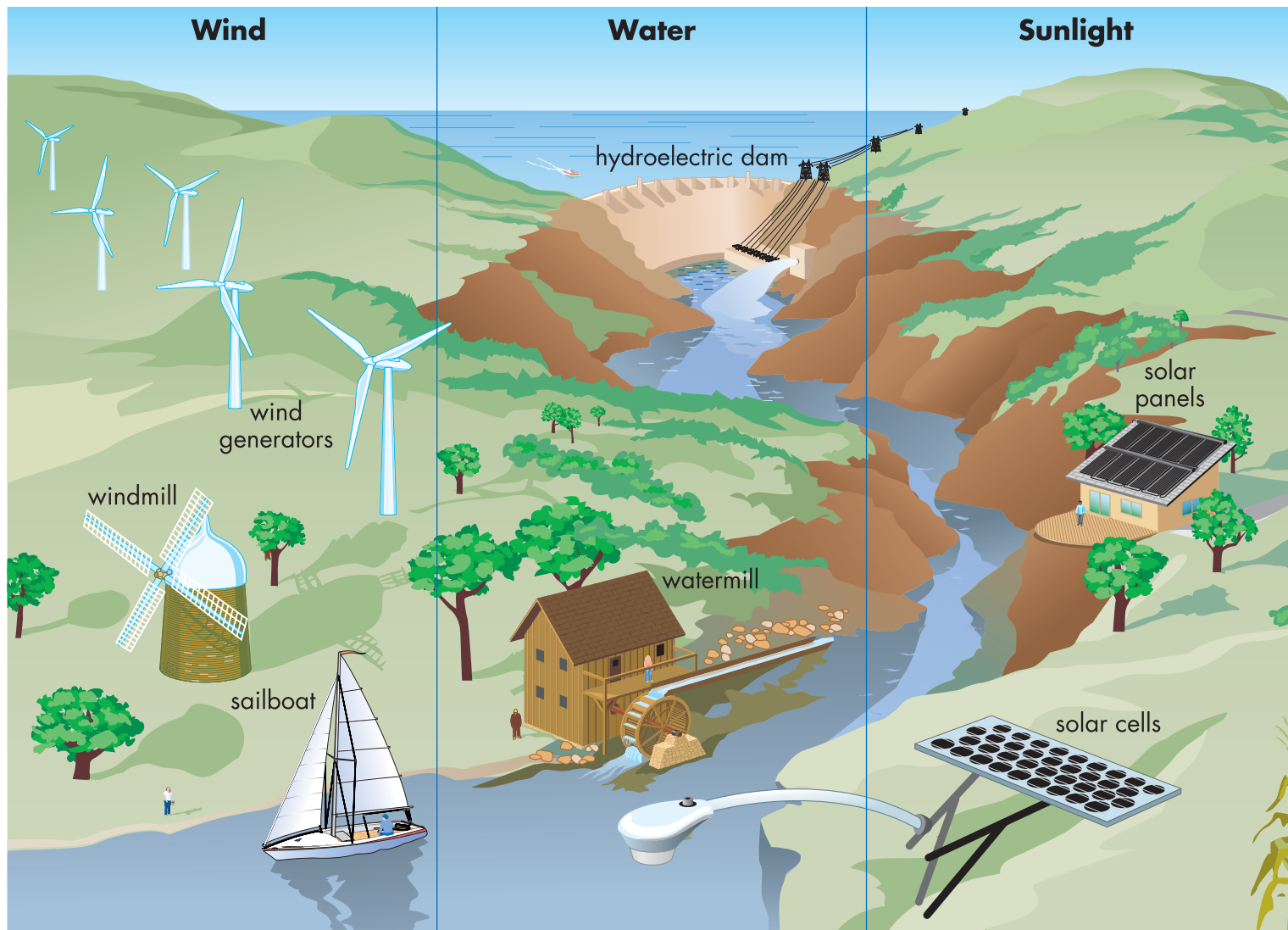
their houses. They ran the hot air in pipes underneath their floors to provide heat.

Scientists gradually learned to use these natural sources to create new forms of energy. These new forms include electricity and nuclear energy. For example, the energy of wind is now used to turn machines that create electricity. On many rivers people have built dams. The dams use the energy of the flowing river to operate machines that also create elec-

tricity. In sunny areas devices collect the heat of the sun and store it. That heat can be used to heat water and to heat houses. Other devices convert the sun's rays into electricity. This is known as solar energy. Scientists have also learned how to use certain atoms to make nuclear energy. Nuclear power in turn can be used to create electricity.

► **More to explore**

Electricity • Fossil Fuel • Heat • Light
• Nuclear Energy



Humans use energy from many different sources. They harness the power of wind, water, and sunlight.

England

England is the largest of the four parts of the country called the United Kingdom.

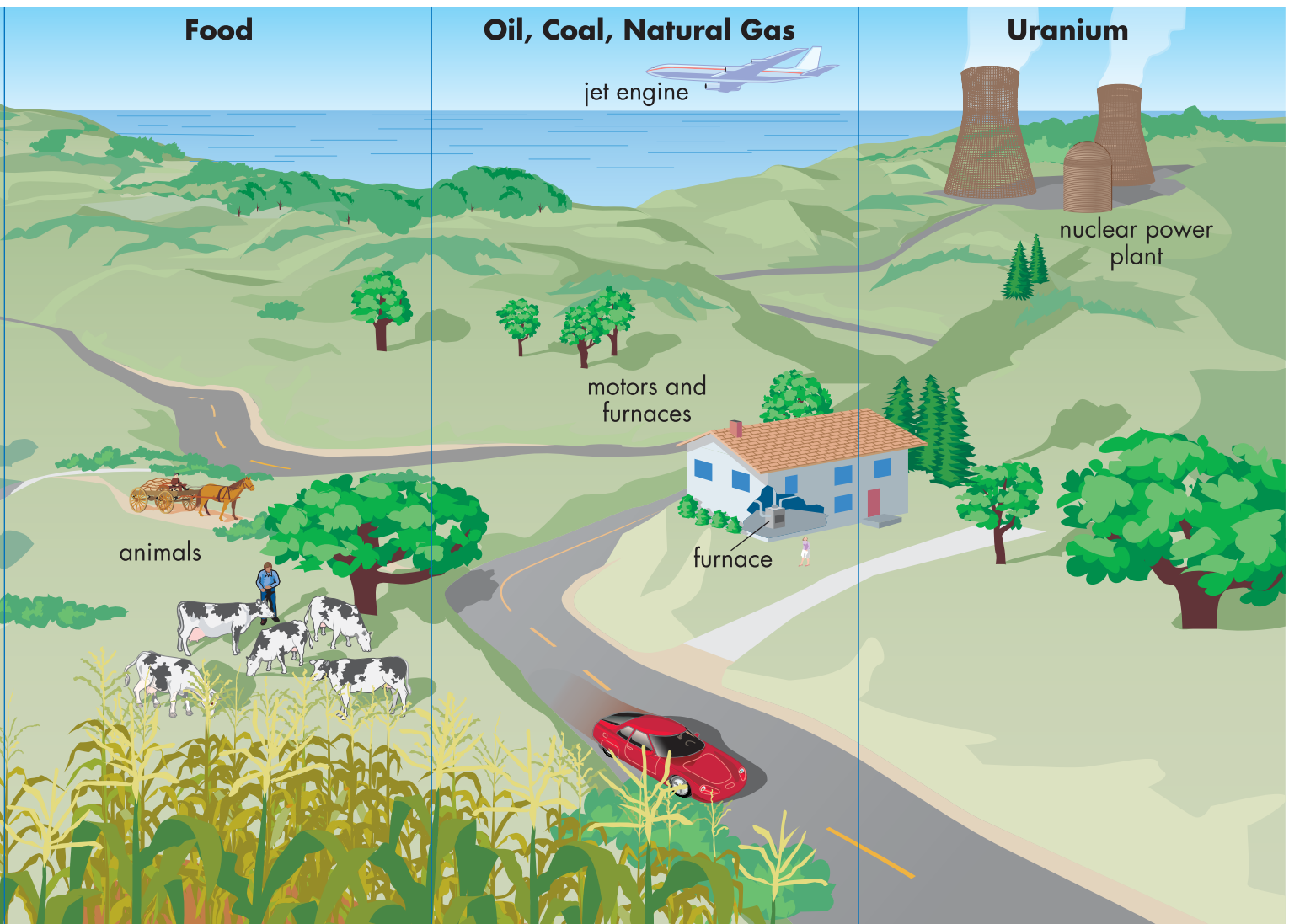
The other parts are Northern Ireland, Scotland, and Wales. London is the capital of both England and the United Kingdom.

Geography

England is located on the island of Great Britain, which lies off the coast of western Europe. The English Channel sepa-

rates England from France. Scotland lies to England's north, and Wales is to its west.

Most of England is covered with hills. The Cumbrian Mountains are in the northwest. The Pennines are lower mountains in the north and center of England. The shores are lined with cliffs and bays. The longest river in England is the Thames. It flows through a large part of the southeast. England's climate is rainy and mild.



Plants and animals provide energy in the form of food. People also burn oil, coal, and natural gas for energy. They get nuclear energy from uranium atoms.



Economy

Services such as tourism, banking, and insurance are the most important part of the English economy. London is a major world center for finance. Manufacturing businesses make foods, chemicals, textiles, computers, automobiles, and aircraft. England's major crops include wheat, barley, and potatoes and other vegetables. Cattle and sheep are raised for meat and milk.

People

The people of England are a mixture of many different ethnic groups. The early people of the area were called Celts. Invaders from Germany, Denmark, France, and other parts of Europe came later. Most of the English people are descendants of these peoples. People from Asia, Africa, and the Caribbean islands make up smaller groups. Most of the population lives in cities.

Most of England's people are Christian. The Church of England, which is Protestant, is the country's official church. There are also large groups of Muslims, Sikhs, Hindus, and Jews.

History

People have lived on the land that is now England for thousands of years. The Celts lived there as early as 500 BC. The Romans came later. In the AD 400s and 500s three peoples from northern Europe—Angles, Saxons, and Jutes—conquered England. Their language, Anglo-Saxon, later developed into English. The region became known as "Angle-land," which later became "England."

The Normans, a people from France, conquered England in 1066. They ruled until 1154, when Henry II came to power. Henry began a new line of



Sheep graze in a field in the Cotswolds, a hilly part of south-central England.

English kings and gained new territory for the country.

The early kings struggled for power with the Roman Catholic church and the nobles. King John was a cruel and unpopular ruler. The nobles joined together to try to limit his power. In 1215 they forced King John to agree to a document called the Magna Carta. The Magna Carta gave rights to the English people. Later in the 1200s Parliament, the English lawmaking body, was formed.

During the reign of Queen Elizabeth I (1558–1603) England became a great power at sea. English ships defeated a fleet sent from Spain. The country's power soon spread to other parts of the world as well. English merchants began to set up trading posts in faraway places, including India and North America.

In the 1600s the English kings fought with Parliament. They did not want to share power. This conflict led to civil war in 1642. People who supported the king fought people who supported Parliament. Parliament won. From 1649 to 1660 England had no king. England welcomed a new king in 1660. But from then on, the power of English kings and queens was more limited.

Over hundreds of years England gradually took control of neighboring territory. Wales was united with England in 1536. In 1707 Scotland merged with England and Wales to form the kingdom of Great Britain. In 1801 Ireland was joined to England, Scotland, and

Wales to form the United Kingdom. Most of Ireland broke away in 1921, but Northern Ireland remained part of the United Kingdom.

► More to explore

Anglo-Saxon • Celt • Elizabeth I
• English Channel • London • Magna Carta • Norman Conquest • Northern Ireland • Parliament • Scotland • United Kingdom • Wales

English Channel

The English Channel is a narrow arm of the Atlantic Ocean. It separates the southern coast of England (part of the United Kingdom, or Great Britain) from northern France. In French, the channel is called La Manche (The Sleeve).

The English Channel is 350 miles (560 kilometers) long. At its widest point it is 150 miles (240 kilometers) across. At its narrowest it is only 21 miles (34 kilometers) across.

The channel and the North Sea are connected at the Strait of Dover in the east.



Did You Know?

The first person to swim across the English Channel was Matthew Webb in 1875. Since then hundreds of people have done it.

The main islands are the Isle of Wight and the Channel Islands (a collection of islands including Jersey, Guernsey, Alderney, and Sark).

Sandy beaches and a good climate have led to the development of many tourist resorts on the shores of the channel. These include Deauville in France and Brighton in England. There are many important ports on both sides of the channel as well. Southampton in England and Le Havre in France are two examples.

Historically, the English Channel has been more than just a body of water to sail on. It has sometimes made it difficult for invaders from the European mainland to reach Britain. At other times it has served them as a travel route. When the Roman leader Julius Caesar invaded in 55 BC, for example, he crossed at the Dover Strait.

As long ago as the 1800s, people thought of building a tunnel under the channel to connect England and France. In 1978 the British and French national railways reached an agreement on the idea. The Channel Tunnel, or “Chunnel,” as it is sometimes nicknamed, opened in 1994.

► **More to explore**
Atlantic Ocean

Enlightenment

The Enlightenment, or the Age of Reason, began in Europe in the 1700s and spread to many parts of the world. The



The French *Encyclopédie* (Encyclopedia) was one of the main works of the Enlightenment. Many thinkers met to discuss this project.

thinkers of the Enlightenment objected to the absolute power of the royal rulers and of the Roman Catholic church. They used reason, or logical thinking, and science to attack this power. Their ideas helped bring about the American Revolution and the French Revolution.

Background

For hundreds of years most European countries were ruled by kings and queens. The countries' royal rulers, or monarchs, were the sons and daughters of earlier kings and queens. These rulers claimed their powers to be given by God. The monarchs, the leaders of the church, and the wealthiest families had always held all the power and all the advantages.

But in the 1500s, during a period known as the Renaissance, the number of educated people in Europe began to grow. Many of these scholars adopted the ideas of the ancient Greeks and Romans. These ideas focused on the

importance of all people and on their ability to reason. Scholars encouraged the study of science. The Renaissance led to important discoveries in the 1600s. Galileo proved that Earth moved around the sun. Isaac Newton explained the laws of gravity.

Ideas of the Enlightenment

The ideas that blossomed during the 1500s and 1600s influenced many thinkers during the 1700s—the time of the Enlightenment. Some of the most famous Enlightenment thinkers were Denis Diderot, John Locke, Jean-Jacques Rousseau, Adam Smith, and Voltaire.

These thinkers, called philosophers, wrote many books, including a 35-volume encyclopedia. Some wrote books questioning religion. They objected to the church having power over everyone. The philosophers criticized the monarchs' laws. They also questioned the idea that God had given the monarchs their power.

Enlightenment thinkers applied science and reason to society's problems. They believed that all people were created equal. They also saw education as something that divided people. If education were available to all, they reasoned, then everyone would have a fair chance in life.

Results

Enlightenment ideas were popular and spread quickly. The Roman Catholic church and the monarchs tried to censor, or ban, the books and other works

of the philosophers. The rulers were right to be alarmed. The Enlightenment led many people to think about their government and to think that they should change the government. They wanted to take power away from the kings and queens and give it to the ordinary people. This led to the American and French revolutions, when the monarchs lost their power.

► More to explore

American Revolution • French Revolution • Philosophy • Renaissance • Science

Environment

All the physical surroundings on Earth are called the environment. The environment includes everything living and everything nonliving.

The nonliving part of the environment has three main parts: the atmosphere, the hydrosphere, and the lithosphere. The atmosphere is the air—the layer of nitrogen, oxygen, and other gases that surrounds Earth. All the oceans and



Children who pick up litter are helping to protect the environment.

other bodies of water on Earth make up the hydrosphere. The lithosphere consists of the rocks and soil on the surface of Earth. People, animals, plants, and all other living things rely on the nonliving parts of the environment to survive. The part of the environment where life happens is called the biosphere.

The biosphere is made up of many ecosystems. These are communities of living things and the nonliving things that they rely on.

Changes in the environment therefore affect living things. Some changes are natural. They include weather conditions; the wearing away, or erosion, of rocks and soil; and natural disasters such as earthquakes.

People make changes in the environment, too. Many of these changes are harmful to living things. Around the world, human activities have destroyed animals' habitats and polluted the air and water. In addition, people's use of oil, coal, and natural gas may have led to global warming. This is a rise in the temperature of Earth's surface.

Today many people are working to protect the environment. These people try to conserve, or save, natural resources. They also try to recycle, or reuse, products to avoid waste and pollution.

► More to explore

Conservation • Earth • Ecosystem
• Global Warming • Habitat • Pollution
• Recycling

Did You Know?

A woman named Rachel Carson wrote about pollution in a book called *Silent Spring* in 1962. It helped start the modern effort to protect the environment.

Enzyme

Enzymes are important substances made by the cells of plants and animals. They are catalysts, or substances that control how quickly chemical reactions occur. These reactions are the processes that keep all plants and animals functioning. Enzymes help the body perform such tasks as digestion and growing new cells.

Enzymes travel both inside and outside cells. However, each enzyme is very particular about where it will work and what it will do. An enzyme usually does just one task. Also, an enzyme acts on only one type of substance, called the substrate. The substrate fits into only one place on an enzyme, the way a key fits into a keyhole.

The many different types of enzyme have many different tasks. Enzymes usually speed up a process that otherwise would be much slower. Some enzymes work in the digestive system of animals to break down food. In plants, enzymes are used in photosynthesis. Photosynthe-



Yeast has enzymes that make dough rise.

sis is the process by which plants get their food from sunlight. Other enzymes move parts from one molecule to another or help a cell burn fuel.

Enzymes are especially important for controlling the speed at which things happen in a cell. For example, the body breaks down sugars for energy. Enzymes make sure this happens slowly so that too much energy is not created too quickly.

People also use enzymes in industry and medicine. Enzymes help to heal cuts and to diagnose certain diseases. They are also an important part of the process called fermentation. This helps turn milk to cheese and juice to wine, and it makes bread rise before it is baked.

► More to explore

Cell • Fermentation

Eoraptor

Eoraptor may be one of the earliest dinosaurs that ever existed. The name *Eorap-*

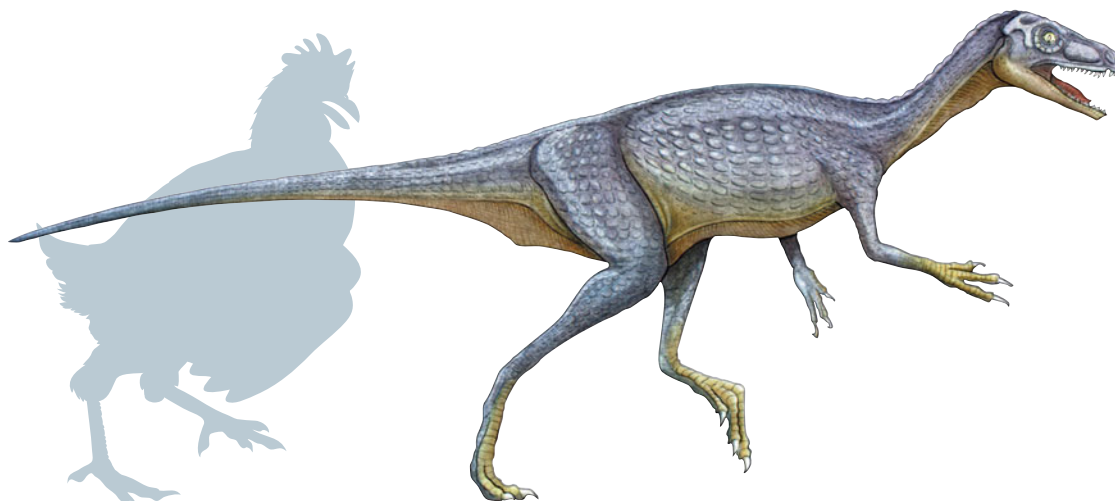
tor means “dawn thief,” “early plunderer,” or “dawn raptor.”

When and Where *Eoraptor* Lived

Eoraptor lived about 231 to 223 million years ago during the period of Earth’s history called the Triassic. *Eoraptor* fossils, or remains, have been discovered in Argentina in South America. The dinosaur lived on a lowland coastal plain with many rivers and lakes.

Physical Features

Eoraptor was considerably smaller than most of the later dinosaurs. It grew to an average of about 3 feet (1 meter) in length and weighed about 22 pounds (10 kilograms). *Eoraptor* stood and walked on its two back legs and had short arms. It had hands with three long clawed fingers at the end of each arm. *Eoraptor* had different types of razor-sharp teeth. Its top teeth were jagged like a saw and curved like those of other meat-eating dinosaurs. The bottom teeth were similar to those of the plant-eating dinosaurs.



Eoraptor was not much larger than a modern-day chicken.

Behavior

Eoraptor was a meat eater. It preyed on small plant-eating dinosaurs. It also ate mammal-like reptiles that were plentiful at the time. Scientists believe that *Eoraptor*, like other meat-eating dinosaurs, also may have been a scavenger. This means that it would have fed on dead animals.

Epidemic



Women in Taiwan wear face masks to protect themselves from getting an illness called SARS. A SARS epidemic began in Asia in 2003.

An epidemic is an outbreak of a disease that quickly infects a large number of people. When an epidemic spreads over a wide area, it is called a pandemic. The disease that causes an epidemic may be passed from person to person. Or it may be carried to people by something nonhuman—for example, insects or infected water.

There have been many deadly epidemics throughout human history. In Europe during the 1300s a disease called the plague killed about 25 million people. It became known as the Black Death.

Smaller outbreaks of plague struck European cities for the next 300 years or so. In 1918–19 there was a deadly influenza (flu) pandemic. More than 20 million people died throughout the world.

Epidemics are not as common as they once were. Cleaner living conditions and improved medicine have helped to slow the spread of diseases. But epidemics of diseases such as malaria and cholera still happen in some parts of the world. The disease called AIDS appeared in the 1980s and spread rapidly, especially in Africa. In 2003 a flu-like illness called SARS became an epidemic. SARS began in Asia and spread throughout the world within a few months.

► More to explore

AIDS • Disease, Human • Influenza
• Plague

Epilepsy

Epilepsy is a medical condition that affects the brain. The brain's cells communicate with other cells by firing tiny



A machine can check the electrical activity of the brain to help determine if a person has epilepsy.

electrical signals. An attack called a seizure happens when brain cells signal much faster than normal. People with epilepsy suffer from such seizures.

Seizures range from mild to harsh. Someone having a seizure may fall down. Muscles may jerk, stiffen, or become limp. The person may lose consciousness. Breathing can stop temporarily. The person may stare, blink, or have sudden emotions.

Epilepsy may result from a brain injury or a brain tumor. A stroke or a disease that affects the brain can also cause epilepsy. Sometimes epilepsy is passed down from parent to child.

Epilepsy is hard to prevent. In about half the cases the actual cause is not known. People can lessen their chance of brain injury by wearing seat belts in cars and helmets on bikes.

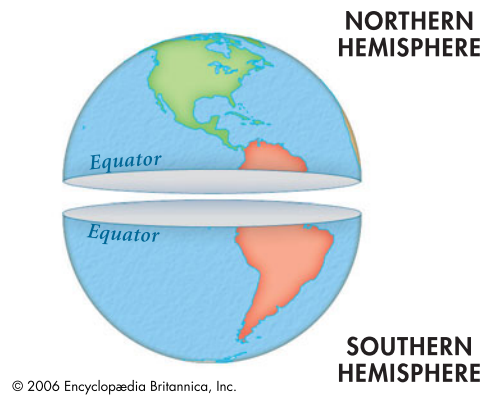
There is no cure for epilepsy. Medicine and a special diet can help control seizures. Sometimes doctors perform brain surgery. They may also place a small machine under the person's skin. The machine sends electricity to the brain to reduce the number of seizures.

► More to explore

Brain • Medicine

Equator

The equator is an imaginary circle around Earth. It divides Earth into two equal parts: the Northern Hemisphere and the Southern Hemisphere. It runs



An imaginary line called the equator runs east and west around the middle of Earth. It divides the globe into two parts, called hemispheres.

east and west halfway between the North and South poles. The distance around the equator is about 24,900 miles (40,000 kilometers).

The equator appears on maps and globes. It is the starting point for the measuring system called latitude. Latitude is a system of imaginary east-west lines, called parallels, that circle Earth parallel to the equator. Parallels are used to measure distances in degrees north or south of the equator. The latitude of the equator is zero degrees.

The equator passes through northern South America, central Africa, the Southeast Asian country of Indonesia, and the islands of Oceania. These places generally have warm climates. This is because the equator receives more direct sunlight throughout the year than any other area of Earth.

► More to explore

Earth • Latitude and Longitude • Map and Globe



Equatorial Guinea

Equatorial Guinea is a country on the west coast of Africa. It includes a mainland region as well as several islands. The capital, Malabo, is on Bioko Island.

Geography

The mainland region, called Río Muni, is bordered by Cameroon and Gabon. The Gulf of Guinea, a part of the Atlantic Ocean, separates Río Muni from the islands of Bioko, Corisco, Great Elobey, Little Elobey, and Annobón. Bioko is made up of three extinct volcanoes. All of Equatorial Guinea has a warm climate with rainy and dry seasons.

Plants and Animals

On the mainland, okume, African walnut, and mahogany trees grow in thick rain forests. Bioko has mangrove swamps along the coast. Hunting has decreased Equatorial Guinea's wildlife, which includes gorillas, chimpanzees, leopards, elephants, and crocodiles.

People

The Fang people form the majority of the population. The largest group on Bioko is the Bubi. Spanish and French are the official languages. Most people are Roman Catholics. Almost half of the population lives in cities.

Economy

Equatorial Guinea's economy depends on its petroleum (oil) reserves. Farming and logging are also important. The main crops are cassava, sweet potatoes, palm oil, bananas, coconuts, cocoa, and coffee. Petroleum, wood, and cocoa are sold to other countries.

History

Portuguese explorers claimed the island of Bioko, which they called Fernando Po, in 1494. In 1778 Spain took over the islands, which were a stopping point for slave traders. From 1827 to 1858 the British occupied Fernando Po, where it fought the slave trade. Spain later combined the islands and the mainland into the colony of Spanish Guinea.

Equatorial Guinea declared its independence from Spain in 1968. The first president ruled harshly, and many citizens were killed or left the country. Later presidents allowed some elections but kept strong control.

► More to explore

Africa • Malabo

Facts About EQUATORIAL GUINEA



Population
(2008 estimate)
616,000

Area
10,831 sq mi
(28,051 sq km)

Capital
Malabo

**Form of
government**
Republic

Major cities
Malabo, Bata,
Mbini, Ebebiyin,
Luba



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Erie, Lake



Lake Erie is the fourth largest of the five Great Lakes of North America. It was named after the Erie Indians, who once lived on its shores.

Lake Erie forms the boundary between the Canadian province of Ontario and the U.S. states of Michigan, Ohio, Pennsylvania, and New York. It covers an area of 9,910 square miles (25,667 square kilometers). It is the shallowest and stormiest of the Great Lakes.

At its eastern end Lake Erie empties over Niagara Falls into Lake Ontario. Its

western end contains several islands. The largest is Pelee Island. Point Pelee National Park is located on the northwestern shore of the lake, in southern Ontario.

Lake Erie has four major ports. Detroit, Michigan, is at the western end. Buffalo, New York, is at the eastern end. Cleveland and Toledo, both in Ohio, are on the lake's southern shore. The lake is an important link in the Saint Lawrence Seaway. The seaway connects the Great Lakes with the Atlantic Ocean.

Severe water pollution nearly destroyed Lake Erie in the 1960s. It forced many beaches and resorts to close. Scientists and others tried to address the problem beginning in the 1970s. By 1990 the quality of the water in the lake had improved greatly.

► More to explore

Great Lakes • Saint Lawrence River and Seaway

Erie Canal

The Erie Canal is an artificial, or man-made, waterway in the U.S. state of



Trees stand among sand dunes on the shore of Lake Erie in Erie, Pennsylvania.



New York. It helps connect the Great Lakes with the Atlantic Ocean. The canal runs 363 miles (584 kilometers) between Buffalo, New York, on Lake Erie, and Albany, New York. From Albany, the Hudson River continues the waterway to New York City.

Work began on the canal in 1817. The engineers and builders who worked on the canal faced many challenges. The land that the canal was to pass through was not flat. The engineers therefore had to figure out how to move boats up and down the natural changes in elevation. They built 83 locks to do this. Locks are



A man steers two mules pulling a boat along the Erie Canal. In the early days of the canal this was how all boats traveled through the canal.

structures that allow boats to be raised or lowered by changing the level of the water beneath them.

By the time the canal was finished in 1825 the engineers had learned a great deal about building canals. They later moved to other states to help build canals throughout the country.

The Erie Canal was an immediate success. It encouraged people to move west and settle the midwestern United States. It also helped the economies of many cities in New York. Boats traveling west through the canal carried settlers from the East Coast to Michigan, Ohio, Indiana, and Illinois. The settlers shipped their farm produce back eastward. In return, manufacturers in the Eastern cities shipped their goods westward. Shipments from New York City to the Great Lakes took eight days using the canal, much faster than before the canal was built.

As the country's railroad system was built, the Erie Canal became less important. However, it stayed in use and was enlarged several times. In 1918 the Erie Canal became the chief link in what is now called the New York State Canal System. Still in operation, it is now used mostly for pleasure boating.

► More to explore

Atlantic Ocean • Canal • Great Lakes

Eriksson, Leif

► see Leif Eriksson.

Eritrea



Parts of Eritrea have a very dry climate.

The country of Eritrea extends for about 600 miles (1,000 kilometers) along the Red Sea in northeastern Africa. The country's name comes from the words *Mare Erythraeum*, the Latin name for the Red Sea. The capital is Asmara.

Geography

Eritrea borders Sudan, Ethiopia, and Djibouti. It includes the Dahlak Archipelago, or group of islands, in the Red

Sea. The high Ethiopian Plateau extends into Eritrea from the south. The lowlands along the coast are warmer and drier than the highlands.

People

The Tigray people make up more than half of the population. The Tigray speak Tigrinya and are mostly Christians. The Tigre, the next largest ethnic group, are mostly Muslims. Their language, also called Tigre, is similar to Tigrinya. Some Eritreans also speak Arabic, English, or Italian. About 80 percent of the people live in rural areas.

Economy

Eritreans' crops include root vegetables, sorghum, beans, and grains. Sheep, cattle, and goats are the main livestock. In Asmara, factories make food products, textiles, and leather goods. The country's mines provide salt.

History

Eritrea was originally part of the empire of Aksum. The Ottoman Empire conquered Eritrea in the 1500s. In 1889 Italy made Eritrea a colony. The British controlled Eritrea from 1941 to 1952, when the land passed to Ethiopia. Eritrea gained independence from Ethiopia in 1993. From 1998 to 2000 Eritrea and Ethiopia fought over a strip of land between them.

► More to explore

Aksum • Asmara • Ethiopia

Facts About ERITREA



Population
(2008 estimate)
5,028,000

Area
46,774 sq mi
(121,144 sq km)

Capital
Asmara

Form of government
Transitional government

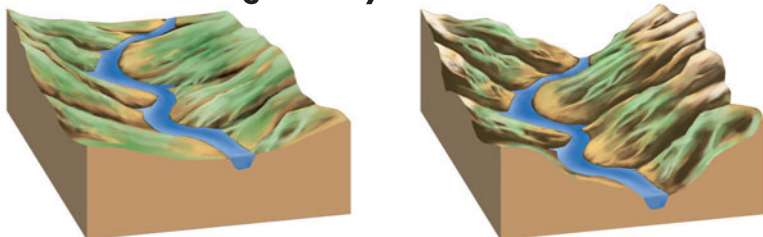
Major cities
Asmara, Keren,
Mendefera,
Asseb, Massawa



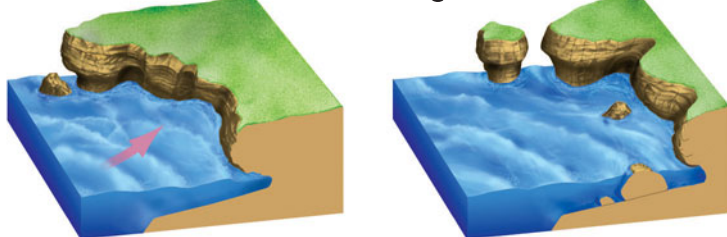
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Types of Erosion

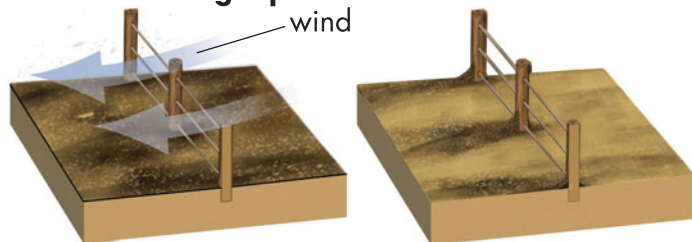
river carving a valley



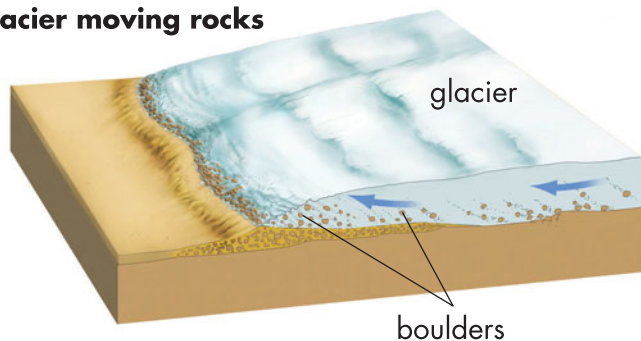
waves cutting back cliffs



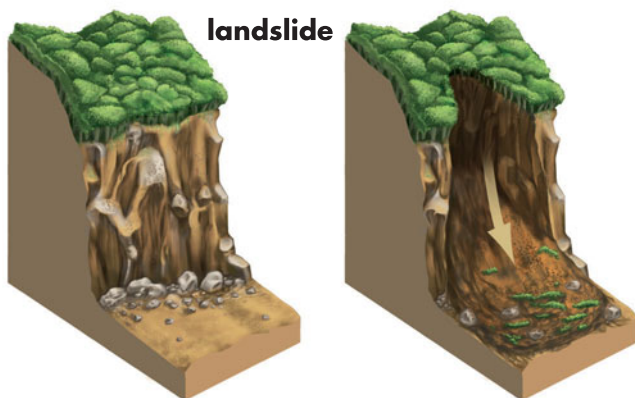
wind blowing topsoil



glacier moving rocks



landslide



Water, wind, glaciers, and gravity all can change the land through the process of erosion.

Erosion

Water, wind, and other natural forces cause rocks and earth to wear away. These forces also move bits of rock and earth to new places. This movement changes the shape of the land. These processes are called erosion.

Types of Erosion

River water picks up and moves mud, pebbles, and larger rocks as it flows downstream. These particles rub against the riverbed and wear away more rock and soil. This kind of erosion helped to carve the Grand Canyon in the southwestern United States. Over millions of years the swiftly moving waters of the Colorado River carried away bits of earth and rock from the land. Little by little the constant rush of water dug a canyon out of a flat stretch of ground.

The pounding of ocean waves against land also causes erosion. The waves constantly move pebbles and sand on beaches. The particles rub against each other and against the rock along the coast. Over time the water and the particles wear down rock into more sand. The water then carries the new sand away.

Like waves, wind constantly carries sand and other small bits of earth from one place to another. Wind forms sand dunes and changes their shape. As wind throws sand and soil at rock, the shape of the rock slowly changes.

The huge masses of ice called glaciers also cause erosion. Glaciers scrape away

parts of the rocks and the earth below as they creep down mountain valleys. Glaciers can even move boulders as big as houses. When the glaciers melt, the moved rocks and earth stay behind.

A landslide shows how gravity helps erosion. Wind and rain can weaken the sides of mountains and hills. Gravity then causes soil, mud, and rocks to tumble down.

Dangers of Erosion

Erosion can be very harmful to farmland. Crops depend on rich soil for healthy growth. But this top layer of soil is thin. Wind and flowing water can sweep it away.

Farmers use several methods to slow down erosion. They plant trees around farmland to block wind. They also cut terraces, or ledges, into sloping land. Water gathers on the terraces rather than rushing down the slope and carrying away the soil.

► More to explore

Canyon • Sand • Soil

Eskimo

The Eskimo are native people of the Arctic regions. They live in Greenland, Alaska, Canada, and eastern Russia. Europeans and others have called them Eskimo for hundreds of years. They have different names for themselves. In Canada and Greenland they prefer to be called Inuit. In Alaska they prefer the term Eskimo.



An Eskimo family sits inside an igloo.

The Eskimo traditionally got almost all their food by fishing and hunting. They ate reindeer, seal, walrus, and whale meat. On water Eskimo hunters traveled in kayaks, which are boats covered with animal skins. On land they rode on sleds pulled by dogs.

The Eskimo made shelters called igloos from blocks of snow. They also built houses of stone or logs covered with earth. In summer they lived in tents made of animal skins. They wore clothing made from animal fur and sealskin.

In the 1800s and 1900s some Eskimo left the Arctic to work in towns and cities. Those who stayed began using foreign goods such as guns, motorboats, and snowmobiles.

At the end of the 20th century there were about 117,000 Eskimo throughout the region. In 1999 Canada created an Inuit homeland called Nunavut.

► More to explore

Native Americans • Nunavut



Estonia

Along with Latvia and Lithuania, Estonia is one of the countries in northeastern Europe called the Baltic states. Estonia's capital is Tallinn.

Geography

Estonia borders the Baltic Sea, Russia, and Latvia. Two large islands, Saaremaa and Hiiumaa, lie west of the mainland. Much of the land is low-lying and marshy. On the Russian border is the large Lake Peipus. Estonia has cool summers and moderately cold winters.

Plants and Animals

Forests cover almost half of Estonia. Pines, firs, birches, and aspens are common trees. The forests provide homes for roe deer, elk, lynx, bears, wild boars, and flying squirrels. Birds include various types of eagles and black storks.

People

About two thirds of the people are ethnic Estonians. The Estonian

language is much like Finnish. Russians form the next largest group. There are also small groups of Ukrainians, Belarusians, and Finns. Christianity is the main religion, but less than half of the people are religious. The population is mainly urban.

Economy

Most Estonians work in services, including transportation, computer technology, and telecommunications. Manufacturers make processed food, electronics, machinery, cotton cloth, and wood products. A key part of Estonia's industry is a mineral called oil shale, which is used for fuel.

History

The Estonians survived invasions by Vikings, Danes, Swedes, and Russians until the 1200s, when German knights conquered the area. By 1629 Sweden had won the Estonian lands. After 1721 Russia ruled Estonia for almost two centuries.

The Estonians declared their independence in 1918. In 1940, however, the Soviet Union made Estonia one of its republics. In 1991 Estonia won full independence from the Soviet Union, which was breaking apart. Estonia joined the European Union in 2004.

► **More to explore**
Baltic Sea • Tallinn

Facts About ESTONIA



Population
(2008 estimate)
1,340,000

Area
17,462 sq mi
(45,227 sq km)

Capital
Tallinn

Form of government
Republic

Major cities
Tallinn, Tartu,
Narva, Kohtla-
Järve, Pärnu



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Ethiopia



The *walia* ibex lives in Ethiopia's Simien Mountains National Park.

Ethiopia is a country in East Africa. It has been a country since ancient times. The capital is Addis Ababa.

Geography

Ethiopia is bordered by Eritrea, Djibouti, Somalia, Kenya, and Sudan. It has no coastline. The land is a mixture of highlands and lowlands. The low Great Rift Valley runs through the highlands toward the northeast. The highest peak in Ethiopia, Mount Ras Dejen, rises to 15,157 feet (4,620 meters).

The climate is mild in the highlands and hotter in the lowlands. There are two rainy seasons, but the country can experience devastating droughts.

Plants and Animals

Grasslands cover much of Ethiopia. Tropical forests grow in the highlands,

but many forests have been cleared to create fields.

National parks and reserves protect some of Ethiopia's unique animals. Among them are the *walia* ibex (a type of mountain goat), the Simien jackal, and the gelada monkey. Ethiopia's lions, elephants, leopards, buffalo, zebras, giraffes, and rhinoceroses are endangered, or at risk of dying out.

People

The Oromo and the Amhara peoples each make up about one third of the population. Other ethnic groups include the Somali and the Tigray. Amharic and Oromo are the most common languages. About half of Ethiopia's people belong to the Ethiopian Orthodox Christian church. About one third of the population is Muslim. More than three fourths of the people live in rural areas, mainly in the highlands.





Women in Ethiopia carry water in jugs.

Economy

Ethiopia is one of the world's poorest countries. The economy depends on agriculture, but poor soil and droughts make farming difficult. The main food crops are corn, sugarcane, sorghum, wheat, and barley. The country grows coffee to sell to other countries. Cattle, sheep, and goats provide meat and leather.

Industry forms only a small part of the economy. Manufacturers make food products, beverages, textiles, leather goods, and chemicals. Mines provide salt, gold, and other minerals.

History

Fossils of some of the earliest human ancestors have been found in Ethiopia. Bones from an apelike creature known as Lucy are between 3 and 4 million years old.

The kingdom of Da'amat ruled the region in the 600s BC. The kingdom of Aksum seized control by around AD 300. Aksum soon adopted Christianity. When Islam started to spread from

nearby Arabia in the 600s, Ethiopia remained Christian. In the 1500s the Portuguese helped the Ethiopians defeat invading Arab armies.

In the late 1800s Italy wanted to make Ethiopia a colony. However, the Ethiopians defeated the invading Italians. Italians again attacked Ethiopia in 1935. The following year they made Ethiopia a part of a territory known as Italian East Africa. The territory lasted until 1941, when British troops forced the Italians out of the area. In 1952 Ethiopia took over Eritrea.

In 1974 Ethiopia's military removed Emperor Haile Selassie from power. That ended the country's ancient monarchy. The military government, known as the Derg, made Ethiopia a socialist country. (Socialists work to spread wealth more evenly among people.)

In the 1970s and 1980s rebel groups fought against the military government. Meanwhile, tens of thousands of Ethiopians died during droughts and famines. In 1991 rebels toppled the military government. Ethiopia held its first democratic elections in 1995.

From 1998 to 2000 Ethiopia fought a border war with Eritrea, which had gained independence in 1993. Tensions between the two countries continued into the 21st century.

► More to explore

Addis Ababa • Aksum • Eritrea
• Human Origins

Facts About ETHIOPIA



Population
(2008 estimate)
78,254,000

Area
435,186 sq mi
(1,127,127 sq km)

Capital
Addis Ababa

Form of government
Federal republic

Major cities
Addis Ababa,
Dire Dawa,
Nazret, Gonder,
Dese, Mekele

Etna, Mount

Mount Etna is the highest active volcano in Europe. It is on the island of Sicily in the Mediterranean Sea. (Sicily is a part of Italy.) Mount Etna is about 11,000 feet (3,350 meters) high. It has a base that measures about 93 miles (150 kilometers) around.

Etna has been an active volcano for more than 2.5 million years. The ancient Greeks created legends about it. According to one story, the volcano was the workshop of Hephaestus, the god of fire, and the Cyclops, a one-eyed giant.

Seventy-one eruptions of Etna were recorded between 1500 BC and AD 1669. The lava flow from a massive eruption in 1669 destroyed a dozen villages and buried part of the town of Catania. Etna erupted 26 more times between 1669 and 1900 and frequently thereafter. In 1983, during an eruption that lasted four months, authorities exploded dynamite to change the lava flow and prevent damage to surrounding towns. Mount

Etna also erupted violently several times in the early 21st century.

► More to explore

Volcano

Eucalyptus



In Australia eucalypti are sometimes called stringybark trees.

Eucalyptuses, or eucalypti, are tall trees. In fact, some of the tallest trees in the world are eucalypti. Eucalypti are sometimes known as gum trees or stringybark trees.

Eucalypti are most numerous in Australia. They also grow in other places where the weather is mild. Eucalypti can be found in New Zealand, South America, southern Europe, and northern Africa. They also grow in California.

There are more than 500 species, or types, of eucalyptus. Some are only about 30 feet (9 meters) in height. But



many eucalypti grow much taller. The giant gum tree of Australia is more than 300 feet (90 meters) tall. Its trunk is about 25 feet (7.6 meters) around.

Eucalypti have long, thin leaves. They are light or dark green. Small flowers grow on eucalyptus trees. They come in many colors, including white, yellow, and shades of red. Eucalypti also have small woody capsules. Inside the capsules are seeds.

Some eucalyptus leaves contain an oil that has a strong smell. The oil is used in medicines, such as cough drops. Eucalyptus wood is tough and durable. It is used to build things such as furniture and fences. The koala, a small Australian mammal, eats eucalyptus leaves.

► More to explore

Koala • Tree

Euoplocephalus

Euoplocephalus was a plant-eating dinosaur that walked on four legs. It was one of a family called the ankylosaurs. The ankylosaurs all had bony plates on their backs and sides that acted as armor to protect them. *Euoplocephalus* was differ-

ent from most other ankylosaurs because it also had bones that protected the face, including the eyelids.

When and Where *Euoplocephalus* Lived

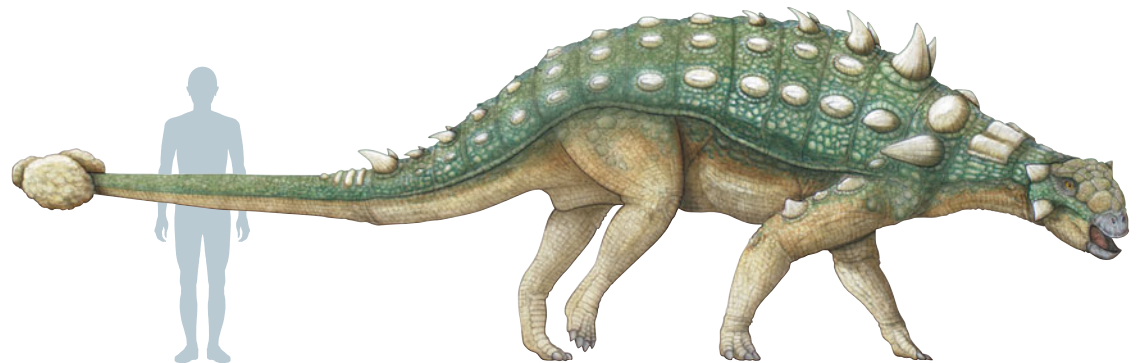
Euoplocephalus lived during the period of Earth's history called the Late Cretaceous. This lasted from 99 to 65 million years ago. Many *Euoplocephalus* remains have been found in the Canadian province of Alberta and in Montana in the United States.

Physical Features

Euoplocephalus was a powerfully built creature. It grew to about 20 feet (6 meters) in length and probably weighed more than 2 tons. Its body was wide and low to the ground. It walked on legs that were short but thick and strong. Large horns jutted out from the rear of the head and the cheek region of the face. Like all of the ankylosaurs, *Euoplocephalus* had a powerful tail with a heavy club at the end.

Behavior

Euoplocephalus moved very slowly. It depended on the bony plates covering its body to protect it from its enemies. The



Euoplocephalus

club at the end of its tail was used as a weapon in self-defense. When attacked, *Euoplocephalus* could swing its tail with a great deal of force. Like most other dinosaurs, *Euoplocephalus* reproduced by laying eggs.

Euphrates River

Together with the Tigris River, the Euphrates forms a great river system of southwestern Asia. The land between these two rivers is known as Mesopotamia. Some of the world's oldest civilizations—Sumer, Akkad, Babylonia, and Assyria—were established there thousands of years ago.

The Euphrates is the longest river in southwestern Asia. It is about 1,700 miles (2,700 kilometers) long. It begins in the mountains of eastern Turkey. It flows southeast through northern Syria and Iraq. The Euphrates runs alongside the Tigris until the two merge in southeastern Iraq. Together they form a river called the Shatt Al-'Arab. The Shatt Al-'Arab flows into the Persian Gulf.



A fisherman casts his net into the Euphrates River in Iraq.

The Euphrates has two flood periods. One is caused by rains from November to March. The other is in April and May when the snow melts in the mountains in Turkey. But because the land it flows through is very dry, the Euphrates loses much water through evaporation.

The climate along the Euphrates is one of cold in the winter and extreme heat in the summer. Temperatures may fall below freezing in the winter in the higher areas. They may be as high as 140° F (60° C) during summer days in the lower areas.

The Euphrates makes the region livable despite the harsh climate. Water from the river is used for irrigation (artificial watering) of farmland along the riverbanks. People have built many canals to bring water from the river to the fields. Farmers grow grapevines, olives, tobacco, and grains. They also grow dates and other fruits. In fact, Mesopotamia has always been known for its date palms. The Euphrates also provides fish, which are another source of food for the region.

► More to explore

Irrigation • Mesopotamia • Tigris River

Europe

Europe is the second smallest of the world's seven continents. Nevertheless Europe has more people than any other continent except Asia and Africa.

Land and Climate

Europe has scarcely any desert, and a greater proportion of its land is suitable for farming than in any other continent. More than half the land—including much of western and eastern Europe—consists of fairly flat, low plains. In parts of northern Europe glaciers have created a rocky landscape. Southern Europe occupies land that juts into the Mediterranean Sea.

Europe's highest mountains are found in the south. The rugged Alps dominate south-central Europe, while the Pyrenees form a high barrier between Spain and France. Europe's eastern boundary is formed by the low Ural Mountains, which stretch through Russia from north to south. (Western Russia is part of Europe, while eastern Russia lies in Asia.)

Europe has many rivers but few large lakes. The major rivers include the Rhine, Seine, and Rhône in the west, the Po in the south, and the Danube, Elbe, Oder, Vistula, Volga, and Don in the center and east.

Most of western Europe has a moist and moderate climate, while eastern Europe has cold winters and hot summers, especially in the southeast. The winter can





be long and very cold in the far north. The countries near the Mediterranean Sea have hot, dry summers and mild winters.

Plants and Animals

Evergreen forests of pine, spruce, fir, and larch grow in parts of the north and northeast. In the southeast lie areas of grassland. Plants that do not need much water, such as olive and cypress trees, grow in the Mediterranean region. The rest of Europe was once a vast forest, but most of it is now gone. Over the centuries people chopped down trees to make room for farming and other human activities.

Many large animals—even lions—once roamed Europe but have disappeared because of human activity. The gray wolf and beaver now survive only in a few remote areas, and the range of the European bison also has been much reduced. Northern Europe is home to reindeer.

People

Most Europeans are descended from other Europeans, though some Europeans are of African or Asian ancestry. The



Spanish girls in traditional dresses pose for a photograph in Sevilla, Spain. Spain is on the western edge of Europe.

vast majority of the people speak either a Romance language (such as French, Spanish, and Italian), a Germanic language (such as German, English, and the Scandinavian languages), or a Slavic language (such as Russian, Polish, and Czech).

Some form of Christianity is the main religion in almost every European country. Most Italians, Spaniards, Portuguese, French, Austrians, Hungarians, Poles, and Belgians are Roman Catholic. Protestantism is the main religion in Scandinavia, the United Kingdom, and The Netherlands. Eastern Orthodox Chris-



There are many fjords in Norway, which is in northern Europe. Fjords are long, narrow arms of the sea.

tians live in Greece, Russia, and other eastern and southern countries. Jews live throughout Europe, but their numbers were greatly reduced in the Holocaust carried out by Nazi Germany during World War II. Muslims live in many European countries and form the majority in Albania, Bosnia and Herzegovina, and Turkey.

Europe is a world leader in education and health. European governments generally provide health care to all citizens, and on average Europeans live longer than people in many other parts of the world.

Economy

The economies of many European nations are based mostly on services, such as trade, tourism, banking, insurance, and shipping. But producing goods is still very important, and Europe is one of the world's major industrial regions. European factories produce machine and metal products, chemicals, appliances, textiles, drugs, and a great variety of other goods. Western Europe has the most highly developed industries, while southern Europe has less manufacturing than the other regions. Minerals extracted in Europe include coal, iron, iron ore, copper, zinc, lead, aluminum, mercury, titanium, potash, and sulfur.

In most of Europe farming contributes less to the economy than services and manufacturing do. But European farms are very productive. The continent is a great producer of cereals, roots, edible oils, fibers, fruit, and livestock. From

Facts About EUROPE

Area

3,844,905 sq mi (9,958,258 sq km)

Population

(2008 estimate) 696,933,440

Largest Country by Area

European portion of Russia: 1,526,200 sq mi (3,952,840 sq km)

Smallest Country by Area

Vatican City: 0.2 sq mi (0.4 sq km)

Largest Country by Population

European portion of Russia: (2008 estimate) 103,560,740

Smallest Country by Population

Vatican City: (2008 estimate) 930

Largest Cities

Moscow, Russia; London, England; Saint Petersburg, Russia; Berlin, Germany; Madrid, Spain

Longest River

Volga River, Russia: 2,193 mi (3,530 km)

Largest Lake

Caspian Sea (Europe/Asia): 143,000 sq mi (370,000 sq km) [off map]

Europe comes most of the world's rye, more than half of the oats, and more than a third of the potatoes and wheat.

History

European civilization first arose in ancient Greece. The Greeks developed ideas about government, philosophy, and the arts and sciences that were followed by many other later societies. According to tradition, the city of Rome (now part of Italy) was founded in 753 BC. Within about 700 years Rome controlled a vast empire. The Romans con-



The Swallow's Nest Castle perches on a cliff above the Black Sea in the Ukrainian city of Yalta.

quered the Greeks but spread many aspects of Greek culture. Beginning in the AD 300s the Romans also spread Christianity. The empire itself spread to the east. In the 400s the western part of the empire, still based in Rome, fell apart.

The Middle Ages lasted from the fall of Rome to about 1500. In place of Roman central government there arose a system of local government called feudalism. A ruler named Charlemagne created a new empire in about 800. Later, from the remains of his empire rose many of the nations of modern Europe.

The Middle Ages were a time of deep religious belief. In 1054 Christianity split into the Roman Catholic church and the Eastern Orthodox church.

The 1500s and 1600s saw a period of arts and learning known as the Renaissance. Meanwhile, many people broke away from the Roman Catholic church during the Protestant Reformation. In the 1700s a period called the Enlightenment stressed the importance of reason-

ing. Its ideas helped fuel the French Revolution of 1789. This revolution helped spread ideas about democracy.

Further change came during the Industrial Revolution, which began in England in the 1700s. Machines made it easier to produce goods. Several European countries also set up large overseas empires. Europe grew wealthy from its industries and its colonies. It came to dominate much of the world.

The first half of the 1900s brought two world wars. Both began in Europe and pitted Germany and its allies against other Western countries. Both brought huge destruction and loss of life.

Following the end of World War II in 1945, most European nations fell into one of two opposing groups. These were the Communist countries of eastern Europe, which were led by the Soviet Union, and the democracies of western Europe. In the early 1990s the Soviet Union broke apart. The countries of eastern Europe began to change to democratic systems.

Beginning in the mid-1900s the countries of Europe created a variety of organizations to help them become more unified. In 1993 one of these organizations became the European Union

► More to explore

Empire • Enlightenment • European Union • Feudalism • Industrial Revolution • Reformation • Renaissance

European Union

The European Union (EU) was formed to bring together the countries of Europe. The EU helps its member countries with issues such as trade, security, and the rights of citizens. By 2007 the group had 27 member countries.

Structure

The European Union has five main parts. The European Parliament makes laws. The voters of EU countries elect its members. The Council of the European Union is the EU's main decision-making body. It is made up of representatives of the governments of the member countries. The European Commission puts EU policies into action. The Court of Justice holds trials. The Court of Auditors makes sure that the EU's money is managed correctly.

History

After World War II (1939–45) the countries of western Europe wanted to avoid future wars. Some leaders thought that

having their countries work together would help.

In 1952 six countries—France, West Germany, Italy, Belgium, The Netherlands, and Luxembourg—formed the European Coal and Steel Community (ECSC). The ECSC brought together the countries' coal and steel businesses. It was a success.

The ECSC countries then looked for other ways to cooperate. In 1958 they set up the European Atomic Energy Community (also called Euratom) to produce nuclear power together. They also formed the European Economic Community (EEC). The EEC worked to get rid of taxes and rules that limited trade in Europe.

The ECSC, Euratom, and the EEC merged in 1967 to form the European Communities (EC). More countries joined the EC in the 1970s and 1980s. The EC was so successful in economic matters that its members started working together in other ways. In 1991 the members agreed to form the European Union. The EU was officially created in 1993. It added more members in the years that followed.

The EU currency, or form of money, is called the euro. It was introduced in 1999. Most member countries switched from their own currencies to the euro. However, the United Kingdom and some other countries did not. Some countries not in the EU, such as Andorra and Monaco, also use the euro.

Did You Know?

The EU has many offices. The Council meets in Brussels, Belgium. The Parliament meets in Strasbourg, France. The Court of Justice meets in Luxembourg.



The euro replaced a number of national currencies, including the peseta (Spain) and the mark (Germany).

Eurydice

► see Orpheus and Eurydice.

Evaporation and Condensation



Steam from boiling water is actually water vapor. It forms through evaporation.

Evaporation and condensation are two processes through which matter changes from one state to another. Matter is anything that takes up space. It can exist in three different states: solid, liquid, or gas. In evaporation, matter changes from a liquid to a gas. In condensation, matter changes from a gas to a liquid.

All matter is made of tiny moving particles called molecules. Evaporation and condensation happen when these molecules gain or lose energy in the form of heat.

Evaporation

As the sun heats water in a puddle, the puddle slowly shrinks. In a similar way, as water in a pot boils, the level of the water falls. These are two examples of evaporation. The water seems to disappear, but it actually moves into the air as a gas called water vapor.

Evaporation happens when a liquid is heated. The heat gives the liquid's molecules more energy. This energy causes the molecules to move faster. If they gain enough energy, the molecules near the surface break away. These molecules escape the liquid and enter the air as gas.

Condensation

An example of condensation can be seen when drops of water form on the outside of a glass of ice water. The drops seem to appear from nowhere, but they actually form from water vapor in the air. The dew that forms on grass overnight is another example of condensation. Condensation is also the reason that clouds form. Clouds are made up of tiny water droplets, formed from water vapor. The droplets collect around dust or other particles in the air.

Condensation happens when molecules in a gas cool down. As the molecules lose heat, they lose energy. As a result they slow down. They move closer to other gas molecules. Finally these molecules collect together to form a liquid.

► More to explore

Dew • Heat • Matter • Molecule
• Water

Everest, Mount

The highest point on Earth is Mount Everest. Everest is one of the Himalayas of southern Asia. The peak is on the border between Nepal and the Chinese region of Tibet. In Tibetan the peak is known as Chomolungma, meaning “Goddess Mother of the World.”

Mount Everest rises to a height of 29,035 feet (8,850 meters). The air at that height is thin, the temperatures are very cold, and the winds are extraordinarily strong. The conditions near the top are too harsh for any plant or animal life to survive. Huge ice sheets called glaciers cover the slopes down to the base of the mountain.

Some Tibetan-speaking peoples live in the valleys below the mountain. The best known are the Sherpa. They live in villages at altitudes up to about 14,000 feet (4,300 meters). The Sherpa are known for their strength and endurance at high altitudes. They lead climbing trips in the Himalayas.



Snow and ice surround the peak of Mount Everest, the highest point on Earth.

Mount Everest has long been a challenge to mountaineers. Early attempts to reach the summit began in the 1920s. They failed largely because of the harsh conditions on the mountain. The first successful climb took place in 1953. Edmund Hillary of New Zealand and Tenzing Norgay, a Nepalese Sherpa guide, were the first to reach the top. Since then there have been a number of successful climbs.

► More to explore

Hillary, Edmund • Himalayas
• Mountain



Everglades

The Everglades is a huge marsh, or wetland, that covers much of southern Florida. It borders the Gulf of Mexico on the west and the Florida Bay on the south. A narrow belt of sandy land lies to the east. The Everglades National Park covers the southwestern part of the



marsh. The Everglades is popular with fishers, boaters, and tourists.

Saw grass, which may grow 10 to 15 feet (3 to 5 meters) tall, covers much of the watery land. Islands called hammocks sit in between stretches of open water. These hammocks are home to trees and shrubs, including palms, pines, cypresses, oaks, and saw palmettos.

The water and the warm climate attract many birds and animals to the Everglades. These include herons, egrets, alligators, snakes, and turtles. The ham-



The Everglades covers more than 4,300 square miles (11,100 square kilometers).

mocks shelter such animals as deer, wildcats, pumas, bears, and many reptiles.

In the past, people drained parts of the Everglades to create farmland. They also built levees (ridges) to prevent flooding in the region. These human activities destroyed much of the Everglades. Today laws protect the marsh from further damage.

Native Americans called the Everglades Pa-Hay-Okee, meaning “grassy water.” They traveled through the marsh in canoes and hunted and fished there. The area’s Calusa Indians disappeared by about 1800. The Seminole Indians moved into the region in the late 1700s.

The Seminole fought a series of wars to keep white settlers from taking over the land. The Seminole finally surrendered to the United States in 1858. Most of them moved west to the Indian Territory, which is now Oklahoma. A small community of Seminole remains in the Everglades.

► More to explore

Florida • Marsh • Seminole

Evers, Medgar

Medgar Evers was devoted to the struggle for equal rights for African Americans. In the end he gave his life for it. His assassination called attention to racial hatred in the southern United States.

Medgar Wiley Evers was born in Decatur, Mississippi, on July 2, 1925. He



Medgar Evers

served in the U.S. Army during World War II. After the war he studied at Alcorn Agricultural and Mechanical College in Mississippi. At the time African Americans were not allowed to go to the state university in Mississippi.

In the southern United States blacks and whites were kept apart in many ways. This policy was known as segregation. African Americans had fewer opportunities than whites and were usually kept from voting.

Evers wanted to end these injustices. In 1952 he joined the National Association for the Advancement of Colored People (NAACP). In 1962 he helped James Meredith enroll at the University of Mississippi as its first African American student. Evers also campaigned for voting rights for blacks.

On the night of June 12, 1963, Evers was shot to death. The murder shocked the entire country. Afterward, civil rights workers strengthened their efforts. Medgar Evers' work was carried on by his older brother, James Evers.

Byron de La Beckwith, a white segregationist, was tried three times for Evers' murder. He was found guilty in 1994.

► More to explore

African Americans • Civil Rights Movement • National Association for the Advancement of Colored People

Did You Know?

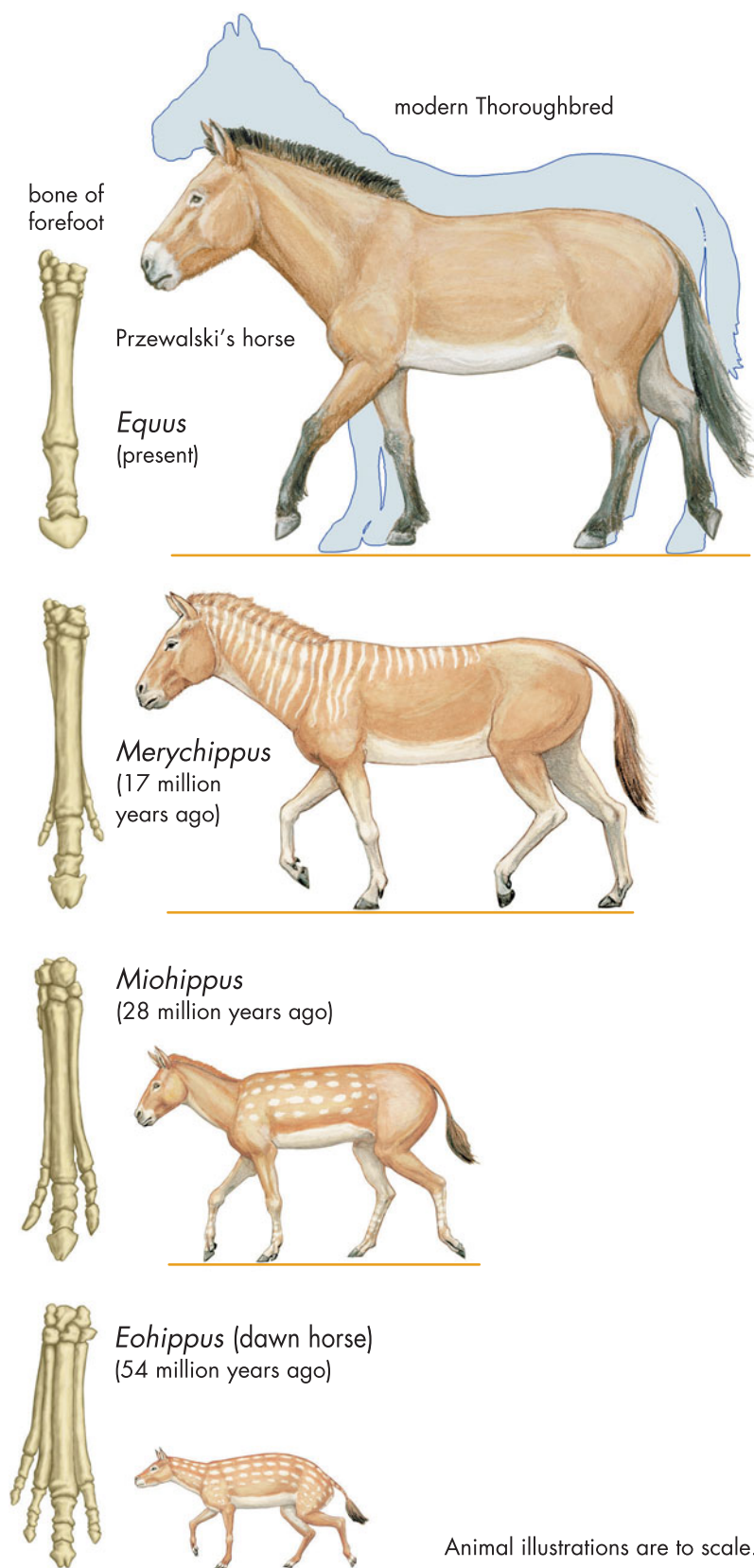
Evers was buried in Arlington National Cemetery near Washington, D.C.

Evolution

Evolution is the theory that all the kinds of living things that exist today developed from earlier types. The differences between them resulted from changes that happened over many years. The simplest forms of life arose at least 3.5 billion years ago. Over time they evolved into the more than 2 million species, or types, of living things alive today.

Some people do not accept evolution because of their religious beliefs. The people who are opposed to evolution believe that God or another being created each species in more or less its present form. Instead of evolution, they accept ideas called creationism or intelligent design.

Nearly all scientists accept evolution. This theory is central to the modern science of biology. As a scientific theory, evolution is testable. Scientists have performed many experiments and examined



Over millions of years horses grew in size. At the same time they lost all but one of their toes.

huge amounts of evidence from a variety of scientific fields. The evidence very strongly supports evolution.

Evidence

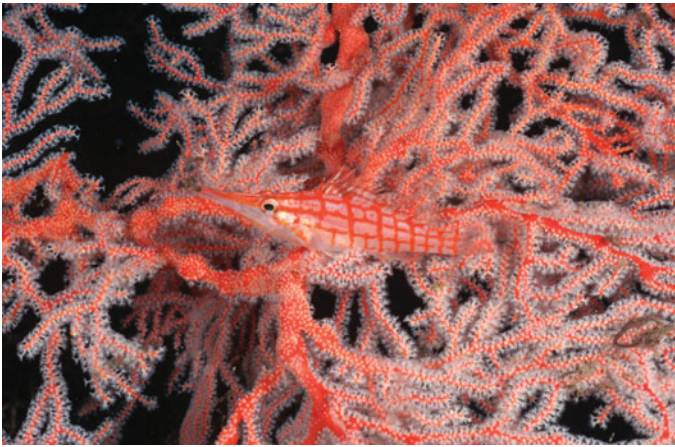
One type of evidence comes from fossils, or the remains of living things preserved in the ground or underwater. Fossils show that many species that once existed were quite different from any kinds alive today. Dinosaurs are an example of this. Many fossils also show how certain living things changed over time. For example, the bones of horses from more than 50 million years ago show that early horses were about the size of modern dogs. Bones from several later stages of the horse show that they got bigger over time.

Very strong evidence for evolution comes from the study of DNA—the material that carries a living thing's genes. Genes pass along traits, or characteristics, from one generation to the next. The DNA of different species shows that they developed from common ancestors.

Natural Selection

Evolution results from a process called natural selection. This process can happen when an individual's genes differ in some way from the genes of others of its kind. Variations, or differences, in genes cause differences in an individual's traits—such as how it looks, its structure, or its behavior.

These variations occur mostly by chance as genes copy themselves to make new



Longnose hawkfish have evolved to look similar to the coral in their habitats. Their color and shape help them to blend into their surroundings.

cells. Mistakes, called mutations, sometimes occur during the copying process.

Most changes in genes either harm the individual or do not matter much. But some changes help an individual to survive and reproduce. For instance, an animal may have better vision or faster legs. These traits may help it find food and avoid its enemies. A tree may have a gene that causes it to make more seeds. Such useful traits give the individual an advantage over others of its kind. It will be more likely to reproduce and pass its genes along to the next generation. Over time, more and more individuals will have the helpful trait. In this way, living things change over time.

Through natural selection species become adapted, or better fit, to their environments. For instance, a sand-colored gerbil living in a sandy desert blends in with its surroundings. Snakes will be more likely to see and eat gerbils of other colors. Over time the gerbils of

other colors will die out, leaving only sand-colored ones.

History

The English scientist Charles Darwin was the founder of the modern theory of evolution. During a trip around the world, he collected fossils and observed the many variations among living things on a group of islands. From these and other studies, he came to believe that new species developed from earlier forms. In 1859 Darwin published his theory of evolution in an important book called *On the Origin of Species*. He later wrote a book about the evolution of humans.

In the early 1900s scientists used ideas from the new science of genetics to explain in detail how evolution happens. Later advances have allowed scientists to study DNA. These studies help scientists determine how closely related various species of living thing are to one another.

► More to explore

Adaptation • Biology • Darwin, Charles
• DNA • Genetics • Human Origins
• Living Thing

Exercise

Exercise is a way of keeping the body healthy through being active. Another name for exercise is physical fitness. Most people exercise in their spare time. Others have jobs that involve exercise. Sports are some of the most popular ways to get exercise.

Did You Know?

Since Darwin's time many more fossils have been collected, including ancestors of modern humans.



Hiking in the mountains is a good way to get exercise.

Kinds of Exercise

The two main kinds of exercise are aerobic exercise and anaerobic exercise. Sports such as football and basketball are great forms of exercise because they combine both of these types.

Aerobic exercise is energetic movement that lasts for a certain period of time. During aerobic exercise the body combines oxygen with sugar to get more energy. The lungs and the heart work harder to bring in extra oxygen. Swimming, cycling, running, and rapid walking are good examples of aerobic exercise.

Anaerobic exercise is a powerful burst of movement followed by a period of rest. During anaerobic exercise the muscles need more energy than the body can make with its supply of oxygen. After the exercise a person feels out of breath because the muscles have worked with-

out oxygen. Weight lifting, jumping, and sprinting are all types of anaerobic exercise.

Health Benefits

Exercise affects every part of the body in positive ways. It improves balance and coordination. It also improves posture, or the resting position of the body. Exercise strengthens the heart and increases the lungs' ability to take in oxygen. Through exercise the bones and muscles get stronger, and the whole body becomes trim and toned.

Exercise also gives people a greater feeling of well-being. People who exercise generally have a more positive, happy attitude.

► More to explore

Sports

Exoskeleton

An exoskeleton is a hard covering that supports and protects the bodies of some types of animals. The word exoskeleton means “outside skeleton.” Many invertebrates, or animals without backbones, have exoskeletons. Insects are the largest group of invertebrates that have exoskeletons.

Insects have exoskeletons made of a substance called chitin. The exoskeletons of crabs, lobsters, shrimp, spiders, ticks, mites, scorpions, and related animals are also made of chitin.

While exoskeletons are hard and stiff, they also have joints, or bendable sec-



A cicada breaks free from the exoskeleton it has outgrown.

tions. These joints allow the animals to move easily. The exoskeletons of land animals also have small breathing holes, which are called spiracles.

As animals with exoskeletons age, their soft inside parts grow. But their exoskeletons do not grow. When an animal's soft body gets too big for the exoskeleton, the exoskeleton splits open and falls away. This process is called molting. The animal's body then forms a new exoskeleton. The animal has no protection while the new exoskeleton is forming.

Many of the invertebrates known as mollusks have a type of exoskeleton called a shell. Mollusks include clams, oysters, scallops, conchs, mussels, and snails. Their shells are made of a substance called calcium carbonate. Mol-

lusks with shells do not molt. As the animals grow, the shells grow, too, along the edges.

► More to explore

Insect • Shell

Exploration

People throughout history have gone exploring to learn about unknown places. By the beginning of the 21st century most of Earth's surface had been explored. Exploration, however, continues in new directions—thousands of feet below sea level and many miles into space.

Exploration of Earth's Surface

The first known explorer was Hannu, an Egyptian who lived in 2750 BC. He brought riches back from what are now Ethiopia and Somalia. Many other great explorers followed. In the 300s BC Alexander the Great of Macedonia (near Greece) made colonies of the lands he



A monument in Lisbon, Portugal, honors Portuguese discoverers. Throughout history, explorers have been admired for their courage and spirit.

explored, as far away as India. In the AD 1200s Marco Polo traveled from Italy to China.

A great age of European exploration by sea began in the 1400s. Portuguese explorers sailed along the coasts of Africa, Arabia, and India. In 1492 Christopher Columbus sailed west and landed in the Americas. In 1522 Ferdinand Magellan's ship completed the first voyage around the world. In the 1700s the British explorer James Cook reached Australia, Hawaii, and other islands in the Pacific Ocean.

Many explorers traveled inland from the coasts to seek riches, to build settlements, or to spread Christianity. In the process, they met—and often fought with—native peoples. In the 1500s Spanish explorers called conquistadors conquered much of Mexico and South America. Between 1804 and 1806 the Lewis and Clark Expedition explored the western parts of North America. Later in the 1800s David Livingstone and Sir Henry Morton Stanley explored parts of Africa that Europeans had never seen.

Explorers first reached Earth's poles in the 1900s. Robert E. Peary and Matthew Henson were the first people at the North Pole, in 1909. The first explorer at the South Pole was Roald Amundsen, in 1911.

Undersea and Underground Exploration

In 1960 Donald Walsh and Jacques Piccard reached the deepest part of the



A crane lowers a craft called a bathyscaphe into the water in 1959. Auguste Piccard and his son Jacques invented the craft to explore the deep sea.

ocean, 35,800 feet (10,912 meters) down. They were in a craft called a bathyscaphe. Even now, much of the ocean remains unknown. Scientists are still discovering new forms of undersea life.

A huge unexplored region lies beneath the ground as well. Russian scientists drilled the deepest hole into Earth between 1970 and 1989. It was 7.6 miles (12.2 kilometers) deep.

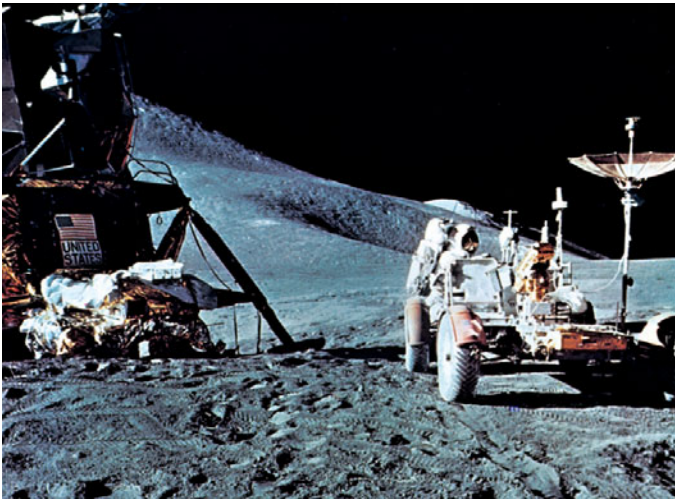
Space Exploration

A human traveler first explored space in 1961. In that year the Soviet cosmonaut Yuri Gagarin orbited, or traveled around, Earth in a spacecraft. On July 20, 1969, the U.S. astronauts Neil Armstrong and Edwin Aldrin became the first humans on the Moon.

Thanks to modern technology, places where no people have gone can still be

Did You Know?

Most of Earth's surface has been explored. But there are many caves just below the surface that are still unexplored.



In 1971 U.S. astronauts spent almost three days on the Moon. They traveled on the Moon's surface using the Lunar Roving Vehicle.

explored. Unmanned spacecraft are operated by radio. These space probes can travel deep into space without having to return to Earth. Space probes have sent back pictures and other information about the planets and other parts of the solar system.

► More to explore

Americas, Exploration and Settlement of the • Polar Exploration • Space Exploration

Extinction

► see Animals, Extinct.

Eye

Humans and other animals use their eyes to see. When people see an object, they actually see light reflecting, or bouncing, off that object. This light enters the eye. The eye changes the light

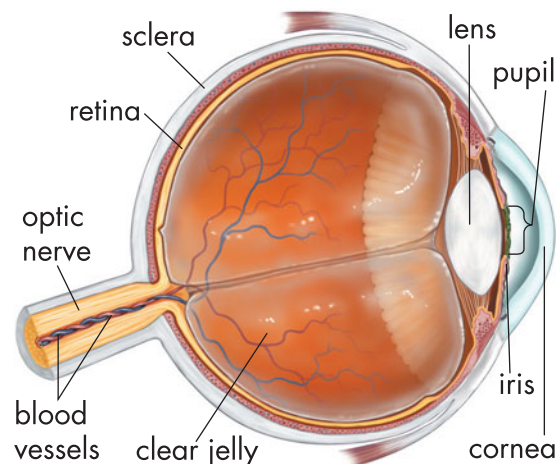
into electrical signals, which travel through the optic nerve to the brain. The brain interprets, or reads, these signals as an image, or picture, of the object.

The Human Eye

Humans have two eyes. Each eyeball sits in a socket, or opening, in the skull. The skull bone protects the eye on the sides and back. The eyelid protects the front of the eye. By blinking, eyelids also move tears across the eye. Tears keep eyes moist. Eyelashes catch dust and other particles that could enter the eye. Six muscles hold the eyeball in place and move it up, down, and sideways.

The eyeball is filled with a clear jelly. Three coats, or layers, surround this jelly. The outer coat consists of the sclera, or white part of the eye, and the cornea. The cornea is the window of the eye, through which light passes.

The middle coat holds the eye's main blood supply. The iris, or colored part of the eye, makes up the front part of this



The lens of a human eye focuses light on the retina.

coat. Light passes through an opening, called the pupil, in the center of the iris. The iris opens and closes to allow more or less light through the pupil. Behind the iris sits the lens. The lens focuses light onto the inner coat of the eye. The muscle that holds the lens in place also adjusts its shape. To focus on objects that are near, the lens thickens. To focus on objects that are far away, the lens flattens.

Did You Know?

Many animals have two eyes that look in different directions. This makes it harder for enemies to sneak up on them.

The inner coat of the eye is called the retina. Cells called rods and cones are built into the retina. These cells collect light. As the cells collect light, they trigger electrical signals. These signals travel through the optic nerve to the brain.

Problems with the Eye

When the eyeball is too long from front to back, a person cannot see faraway objects clearly. This condition is called nearsightedness. Similarly, farsighted people have trouble seeing nearby objects. Their eyeballs are too short. Glasses, contact lenses, or surgery can correct these problems. Blindness happens when the eye's lens becomes cloudy or when the retina is damaged.

Eyes of Other Animals

Vertebrates, or animals with a backbone, each have two eyes similar to human eyes. But there are differences, which depend on the animal's habitat and behavior. For example, the pupils of animals active at night are often shaped like slits. This allows the pupils to close almost completely to protect the eyes from bright light.

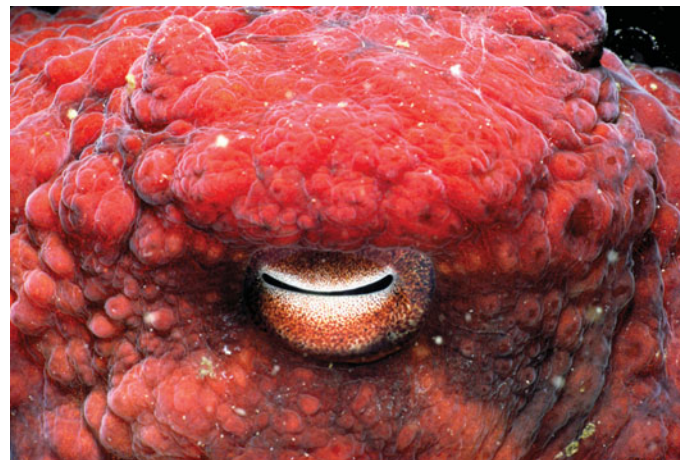


A gecko narrows its pupils to protect its eyes from bright light. Geckos and other animals that are active at night often have slit-shaped pupils.

Invertebrates, or animals without a backbone, have various other kinds of eyes. Some mollusks, including octopuses, have large eyes that are similar to vertebrate eyes. Other mollusks and spiders have simple eyes called ocelli. Insects have compound eyes. These are made up of many lenslike parts. Worms and some protozoans merely have eye-spots that are sensitive to light.

► More to explore

Blindness • Brain • Lens • Light



The eye of a giant Pacific octopus is large and complex. It gives the octopus a sharp sense of sight.

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Figs are called fruits, but they are actually inside-out flowers.

(See Fig.)

Fireflies make light by mixing chemicals in their body with oxygen from the air.

(See Firefly.)

The flower of a plant is where the plant's seeds are produced.

(See Flower.)

A substance called cholesterol can build up in blood vessels and block the flow of blood.

(See Food and Nutrition.)

Fossil fuels, such as petroleum, are the remains of plants and animals that lived long ago.

(See Fossil Fuel.)

Benjamin Franklin said, "Early to bed and early to rise, makes a man healthy, wealthy, and wise."

(See Franklin, Benjamin.)

Did You Know?

Many fables feature a sly fox or a cruel wolf. They teach children to beware of people who are sly or cruel.

Fable

A fable is a kind of story that teaches a lesson. Fables are usually entertaining tales featuring animals that talk and behave as people do. Because they have humanlike qualities, the animals show how foolish or wise people can be. For example, “The Three Little Pigs” teaches that hard work is important: The house built by the hardest-working pig is the only one that survives the wolf’s attacks.

Some of the oldest fables came from India and Greece thousands of years ago. Many fables that are familiar in English today—including “The Hare and the Tortoise” and “The Wolf in Sheep’s Clothing”—are said to have been written in ancient Greece by a man named Aesop. These tales have been translated into many different languages. Another famous fable writer was Jean de La Fontaine. His books of fables were published in the 1600s in France. They were admired as literature. Today new fables are still written or adapted from older ones for children’s books and movies.

► More to explore

Aesop • Literature for Children
• Storytelling

Falcon

Falcons are birds of prey, meaning that they hunt and eat animals for food. They are swift, powerful fliers. A sport called falconry dates back to ancient times. It involves training falcons to hunt animals in cooperation with humans. Some common kinds of falcons



“The Three Little Pigs” is a well-known fable. A wolf destroys the houses of two pigs, but he cannot destroy a third house. The third pig worked hard to make a sturdy house.

include the peregrine falcon, the merlin, and several types of kestrels.



A kestrel with a grasshopper in its beak perches on a fence post.

Falcons are found nearly all over the world. They live in many habitats, including forests, deserts, grasslands, and even cities.

Usually the female falcon is larger and bolder than the male. Falcons range in size from about 6 to 24 inches (15 to 61 centimeters). The gyrfalcon is the largest of the falcons.

A falcon has sharp claws and a short hooked beak. The beak usually has a small notch called a tooth. These features help it catch and kill prey animals.

A falcon's shape helps it fly quickly. Its body is shaped like a bullet, while its wings are long and pointed. Unlike hawks and eagles, falcons rarely soar and glide. They dive down fast to catch prey. Some falcons capture other birds in

midair. Other falcons kill hares, mice, lizards, and insects on the ground.

► More to explore

Bird • Bird of Prey • Eagle • Hawk

Falkland Islands

The rocky and nearly treeless Falkland Islands lie 300 miles (480 kilometers) northeast of the southern tip of South America. The islands are an overseas territory of the United Kingdom. Argentina also claims the islands. It calls them the Malvinas Islands. The capital of the Falklands is Stanley.

Geography

The Falklands include two main islands—East Falkland and West Falkland—and about 200 smaller islands in the South Atlantic Ocean. Hills stretch across the northern parts of



Many penguins live on the Falkland Islands and nearby islands.

both main islands. The climate is chilly, rainy, and windy.

Plants and Animals

Grasses cover much of the land. Seals and sea lions bask on the beaches, while dolphins and whales swim offshore. Black-browed albatrosses and other seabirds soar overhead. Millions of penguins breed on the islands.

People and Economy

Only about 3,000 people live on the islands. Most of them speak English and have British ancestors. Most live in Stanley, which is the only town of any size. The main jobs are fishing and sheep raising. Tourism is also important to the economy.

History

The known history of the Falkland Islands begins with visits by European explorers in the 1600s. The French founded the islands' first settlement on East Falkland in 1764. In 1765 the British settled West Falkland. The Spanish soon took over these settlements. The British returned in 1771 but left in 1774.

Argentina—the South American country closest to the Falklands—claimed the islands in 1820. In 1833, however, the British took over the islands. Argentina never accepted British rule of the Falklands. On April 2, 1982, the Argentines invaded the Falklands. This started the Falkland Islands War. The British defeated the Argentines 10 weeks later.

Despite its defeat, Argentina continued to claim the islands.

► More to explore

Argentina • United Kingdom

Famine



Donations of food from the United States have helped to protect many countries from famine.

A famine exists when large numbers of people cannot get enough food for long periods of time. People in a famine may die from starvation or disease. There have been famines throughout history and in all parts of the world.

Natural disasters, including drought, earthquakes, and floods, can cause famines by destroying crops or by making it difficult to distribute food. Other causes include insects that destroy crops, very cold weather, too much rainfall, and diseases that harm crops or livestock.

Did You Know?

Sheep outnumber people on the Falklands by about 200 to 1.

Wars also may cause famines. Armies may call farmers away. Stored food may go to soldiers. Blocked roads may make it hard to transport food easily.

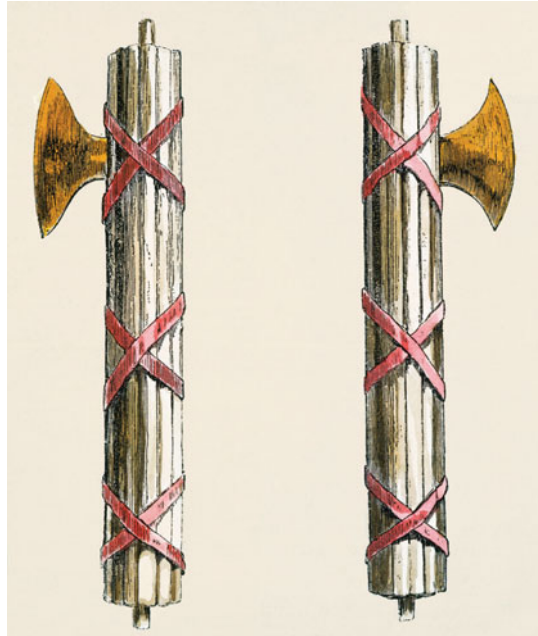
Some countries have too many people for the amount of available food. These countries tend to be poor. This makes it even harder to deal with famine because they do not have the money to buy food from other countries for their people.

Depending too much on one kind of food can also lead to famine. Ireland used to depend heavily on potatoes. When that crop failed during 1845–49, more than 1 million people died. Producing a variety of foods can help countries avoid famine.

Famines rarely start suddenly. There is usually a warning time during which steps can be taken. Government leaders can store extra food and later give it to hungry people. They can also ask other countries for help.

Fascism

In ancient Rome, the *fascis*—a bundle of rods strapped together around an ax—was a symbol of power. In 1919 the Italian leader Benito Mussolini named his forces *fasci*, after this symbol. Later, Mussolini's style of government became known as fascism. Fascist leaders believe that the strength of the country is more important than the well-being of the people. They rule as dictators, or rulers with unlimited power. They often use violence.



The fasces of ancient Rome consisted of a bundle of rods and an ax strapped together. The Italian leader Benito Mussolini compared his followers to the rods of the fasces. Each rod by itself may be weak, but when many rods are bound together they are strong.

Characteristics of Fascism

Experts disagree about the exact meaning of the term fascism. However, the governments that have been called fascist in the past had certain characteristics in common. Under these governments, the people had few freedoms. They had no voice in the government. Instead, a strong leader controlled everything and became a symbol of the country. The leader built up the police force to punish people who disobeyed. The leader also built up the army and threatened other countries. The leader blamed minority groups for the country's problems.

History

European writers began to introduce fascist ideas in the 1800s. After World

War I (1914–18) many countries faced economic problems. In some, the people were unhappy with the results of the war. Fascists came to power by promising the people power and glory. Mussolini took power in Italy. Adolf Hitler led Nazi Germany. These countries began to build up strong armies. They used the armies to take over other countries. These actions resulted in World War II (1939–45). Italy and Germany fought on the same side during the war. They lost the war, however, and their fascist governments fell.

After the war, the major fascist movement was dead. However, rulers in such countries as Spain and Portugal continued to follow some fascist ideas. Some political groups in other countries—for example, Austria, France, Argentina, South Africa, Libya, and Iraq—also used some fascist ideas. This development was called neofascism, or new fascism.

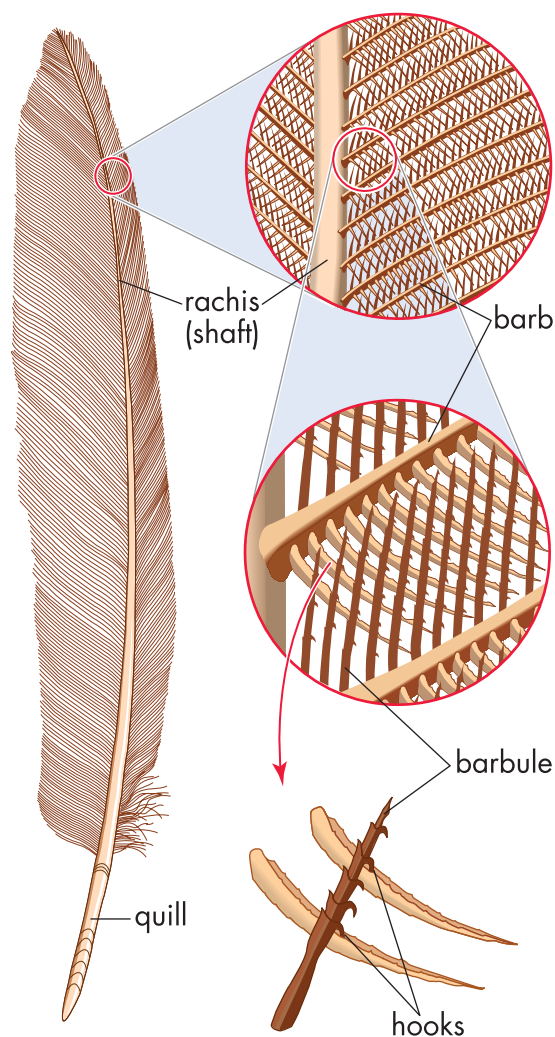
► More to explore

Dictatorship • Hitler, Adolf • Nazi Party

Feather

Feathers are lightweight growths that cover a bird's body. All birds have feathers, but no other animals have them. According to many scientists, birds developed from reptiles millions of years ago. As the reptiles became birds, their scales became feathers.

Feathers are important to survival, so birds spend a lot of time cleaning and taking care of them. At least once a year



Tiny hooks hold together the feathers on a bird's body.

birds shed their feathers through a process called molting. Then new feathers grow in.

Structure

Like hair, fingernails, and claws, feathers are made of a substance called keratin. Keratin is both lightweight and strong.

All feathers have a stiff stalk, called a shaft, in the center. One end of the shaft, called the quill, sticks into the bird's skin. The rest of the shaft is called the rachis.

Did You Know?

One hundred years ago women decorated their hats with large feathers. Some kinds of birds were almost wiped out by hunters collecting such feathers.

Pairs of stiff branches, called barbs, stick out in both directions all along the rachis. From these barbs grow smaller barbs, called barbules. The barbules have hooks on them. The hooks attach themselves to other nearby barbules so that the feathers hold together on the bird's body.

Some birds do not have these barbules and hooks holding the feathers in place. The feathers of these birds look more like hair.

Types and Uses

Different kinds of feathers have different purposes. Straight, stiff feathers give birds their ability to fly. Tail feathers help with steering, balance, and braking. Small, fluffy feathers, called down, keep a bird's body from getting too cold and its skin from getting wet.

People in many cultures also use feathers. They decorate hats, clothing, and jewelry with colorful feathers. They fill clothing, pillows, and comforters with down for softness and warmth. Some governments protect rare birds from hunters who would kill them for their feathers.

► More to explore

Bird • Hair

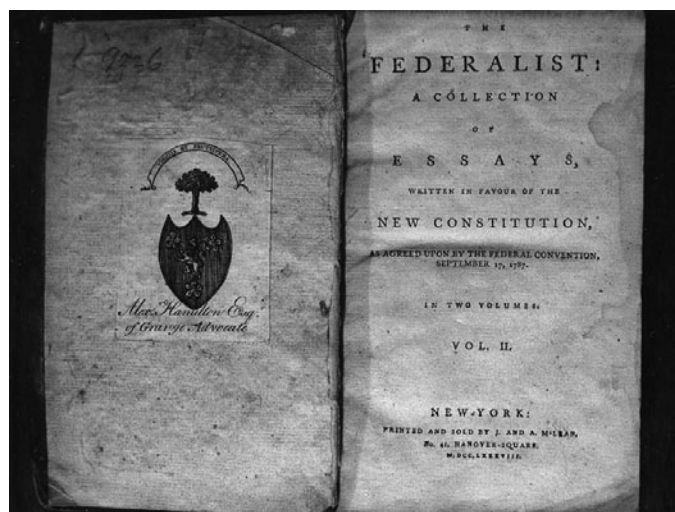
Federalist Papers

The Federalist papers are a series of 85 essays published in 1787 and 1788. Alexander Hamilton, James Madison, and John Jay wrote the essays to explain why the new Constitution would be

good for the United States. Scholars still recommend the Federalist papers to anyone who wants to understand the Constitution.

A group of men wrote the Constitution in Philadelphia, Pennsylvania, in 1787. The Constitution set up a federal system of government. In a federal system the national government and the state governments share power. People who supported the federal system were called Federalists. Other people feared that the new national government would be too strong. They were called Anti-Federalists.

Anti-Federalists were powerful in New York. To get the people of New York to approve the Constitution, Hamilton began writing articles in New York newspapers. Madison and Jay soon joined him.



Most scholars believe that Alexander Hamilton wrote most of the Federalist papers. There is some uncertainty because the authors signed their essays with a made-up name, Publius.

The Federalist papers argued that the new federal government would not be too strong. They explained how the national government would share power with the states. They also explained that the Constitution divided the power of the federal government into three branches. The system called checks and balances would prevent any of the branches from becoming too powerful.

► **More to explore**

Hamilton, Alexander • Madison, James
• United States Constitution

Federated States of Micronesia

► see Micronesia, Federated States of.

Ferdinand and Isabella

Ferdinand and Isabella were the first king and queen of Spain. They were called the Catholic Monarchs because they strongly supported the Roman



Ferdinand and Isabella

Catholic church. They are also known for sending Christopher Columbus to explore the New World.

Background

Isabella was born on April 22, 1451. Ferdinand was born on March 10, 1452. At that time the land that is now Spain was divided into several kingdoms. Isabella's father was the king of Castile, a kingdom in central Spain. Ferdinand's father was the king of Aragon, in north-eastern Spain. Princess Isabella married Prince Ferdinand in 1469.

Isabella became queen of Castile in 1474, but the king of Portugal also wanted to rule there. Isabella defeated him in war in 1479. In the same year Ferdinand became king of Aragon. Castile and Aragon were then joined under the rule of King Ferdinand and Queen Isabella. The combined kingdom was the beginning of Spain.

Reign

Ferdinand and Isabella banned all religions other than Roman Catholicism. In 1478 they established a court that treated non-Catholics very harshly. The court was called the Spanish Inquisition. In 1492 Ferdinand and Isabella forced all Jews who would not become Catholics to leave Spain.

Ferdinand and Isabella also fought to drive Muslims from Spain. Muslims from North Africa had controlled much of the area since the 700s. Over hundreds of years Christians gradually took land back from the Muslims. In 1482 Ferdinand and Isabella went to

war with Granada, the last Muslim kingdom in Spain. They defeated Granada in 1492. Spain was then a united Christian country.

Later in 1492 Ferdinand and Isabella supported Columbus' first voyage across the Atlantic Ocean. The places where Columbus landed became colonies of Spain. Isabella died on November 26, 1504. Ferdinand died on January 23, 1516.

► More to explore

Columbus, Christopher • Inquisition
• Spain

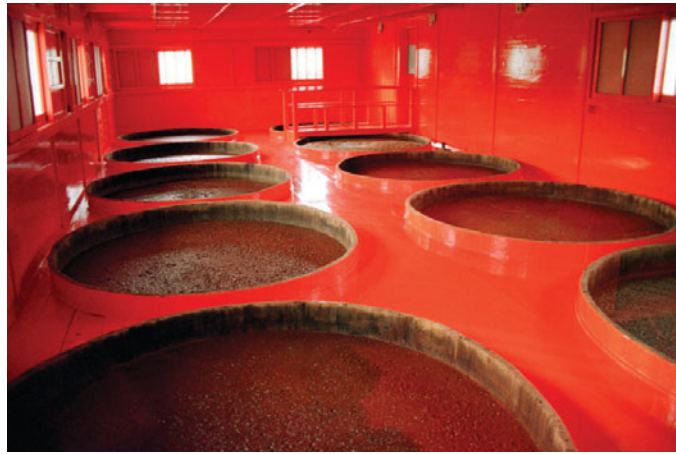
Fermentation

Fermentation is a chemical change that happens in vegetable and animal substances. For thousands of years people have used fermentation to make bread, wine, beer, cheese, and other foods.

Fermentation often happens through the work of tiny living things called yeasts, bacteria, and mold. These living things create substances called enzymes. The enzymes break down food into chemicals.

When bakers add yeast to bread dough, the yeast breaks down the sugars in the dough. While this happens, carbon dioxide gas is released. The escaping carbon dioxide makes the bread rise.

When winemakers add yeast to grape juice, the yeast changes the juice's sugar



At a soy sauce factory in Japan, soybeans ferment in huge containers called vats.

into alcohol. Beer is another drink made through the fermentation caused by yeast.

People eat many other fermented foods. Cheese comes from milk or cream that has been fermented by bacteria. Soy sauce is made from fermented soybeans. As meat ages it becomes more tender. This is also due to fermentation.

In addition, scientists use fermentation to make certain drugs and vitamins. The drug penicillin is made through fermentation caused by mold.

► More to explore

Enzyme

Fern

Ferns are flowerless green plants. They are usually easy to recognize by the featherlike shape of their leaves, which are called fronds. Ferns reproduce by spores rather than by seeds. Some plants that are called ferns, such as asparagus



A type of fern known as a shield fern grows in a rocky crevice.

ferns, reproduce by seeds and are not true ferns.

There are about 12,000 different species, or types, of fern throughout the world. Some types first appeared on Earth more than 360 million years ago. Ferns commonly grow in tropical rain forests. They also grow in other warm, moist places where there is plenty of shade. Very few species of fern are found in dry, cold places.

Many fern species grow on the trunks and branches of trees. Others grow in bogs and marshes or float on the surface of ponds. Some types of fern, called bracken, spread like a weed through fields and pastures.

Ferns come in a wide variety of sizes and shapes. The smallest ferns are only a fraction of an inch tall. The largest ferns measure from 30 to 80 feet (10 to 25 meters) tall. Young fern leaves are

tightly curled. When they grow and begin to unfurl, they resemble the neck of a violin.

Ferns grow millions of cells called spores on the underside of their leaves. These spores scatter into the air. A small number of them fall on damp surfaces and soils. They grow into tiny, kidney-shaped structures. These structures produce male and female cells, which together produce a new fern.

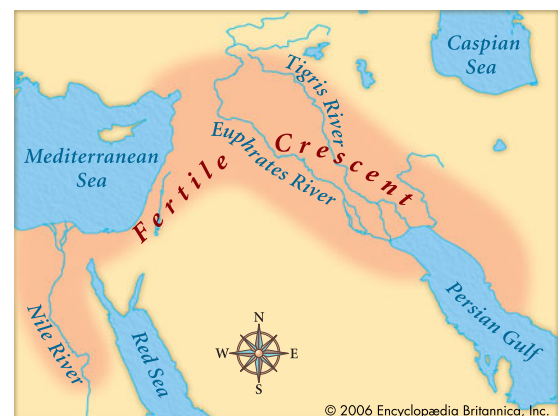
People often use ferns to decorate their homes and gardens. Such animals as deer eat ferns, and some birds use them to line their nests.

► More to explore

Plant

Fertile Crescent

The Fertile Crescent is a part of the Middle East where some of the world's first civilizations began. In ancient times the land there was fertile, or good for growing crops. On a map, the land forms the shape of a crescent moon. The Fertile Crescent extends from the Persian Gulf to the Nile River valley. It



includes the areas known as Mesopotamia and Palestine.

The people of Mesopotamia (now Iraq) may have settled in villages as long ago as 8000 BC. They farmed the land near the Tigris and Euphrates rivers. By about 3500 BC they may have built cities. They also developed governments, laws, and writing. Historians describe such a society as civilized.

Another early civilization arose in ancient Egypt. Soon after 5000 BC people were raising crops using water from the Nile.

► More to explore

Civilization • Egypt, Ancient
• Mesopotamia • Middle East

Festival and Holiday

People everywhere celebrate special days known as festivals or holidays. Although each festival and holiday has a different purpose, they tend to have some things in common. Many are associated with traditions. These include decorating a tree at Christmas or lighting menorah candles during Hanukkah. Festivals and holidays also bring people together in a variety of ways. For some holidays people join together for solemn ceremonies—such as honoring the war dead on Memorial Day. Other holidays, such as Mardi Gras, are occasions for joyous celebrations.



During the Harbin Ice Festival in China, people visit huge ice structures that are lit up with colored lights.

The word festival comes from the word feast (an elaborate meal). Many festivals were originally connected with the planting or harvesting of crops. Food still plays a major role in many of today's festivals and holidays. The Thanksgiving turkey is an example of a traditional food linked to a holiday.

The word holiday originally meant "holy day." Many holidays are still religious occasions—for example, the Muslim holy month of Ramadan. Other holidays are not religious. For instance, national holidays, such as the Fourth of July in the United States, help citizens to remember their country's history.

Feudalism

Feudalism was a social system that developed during the period called the Middle Ages in Europe. It probably began after the rule of Charlemagne, the leader of a mighty European empire. After Charlemagne's death in 814 his



A painting shows serfs giving animals to their lord.

empire broke into several pieces. No one central government replaced it. Instead people lived in smaller local units or kingdoms. The individual kingdoms faced attacks by Vikings and other people, including nearby kingdoms. The people established relationships within their units that allowed them to live in relative peace.

How Feudalism Worked

To protect themselves, local warlords built castles. They also depended on warriors on horseback called knights.

A lord and his knights formed a bond by swearing oaths of loyalty. The lord gave each knight, also called a vassal, land that was known as a fief. In exchange, the knights vowed to perform military service whenever the lord asked. Eventually the lords themselves became vassals of a king.

Common people, called peasants, were at the bottom of the feudal society. They farmed the land and did the other work that supported the lords and vassals.

Peasants called serfs lived in a village near the lord's castle. They were not slaves, but they were not free to move away. They owed the lord work and payments of food. In return they got protection from outside attackers.

The End of Feudalism

Feudalism developed in times of violence and disorder. The new system brought safety and order. This allowed people to travel and to establish trade. People became more wealthy, and money was used more frequently. Eventually vassals started to pay rent to their lords instead of giving military service. Many lords used the money to hire professional soldiers instead of depending on knights.

By the 1300s feudalism had disappeared almost completely. Europeans created new forms of government that were not based on the fief. Monarchies, or rule by kings, grew stronger.

However, traces of feudalism stayed on in Europe for hundreds of years. Peasants in France owed duties to large landowners until the French Revolution, which started in 1789. In Russia the serfs did not gain freedom until 1861.

► More to explore

Knight • Middle Ages

Fiber Optics

Fiber optics is a way of sending information through thin fibers, or threads. The information may be sound, pictures, or

computer codes. This information travels through the fibers in the form of light.

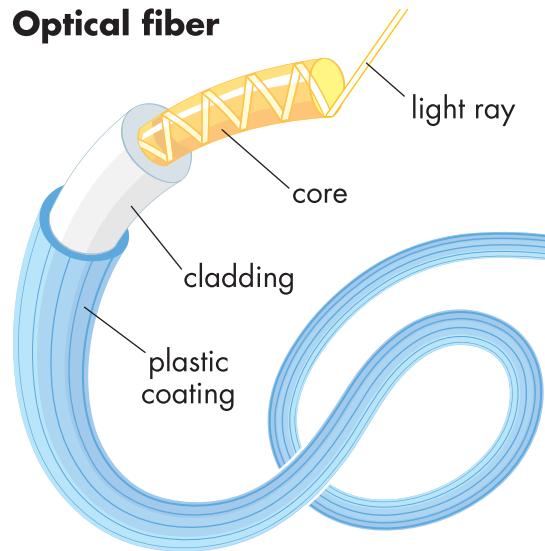
The fibers, known as optical fibers, can be made of glass or plastic. They are about as big around as a human hair. Many fibers are bundled together to form a fiber-optic cable. Fiber-optic cables link some telephones and computers. Doctors also use fiber-optic instruments to see inside the human body.

In a fiber-optic system, a machine called a transmitter turns information into light. Then the transmitter sends the light through optical fibers. The inner part of each fiber is called the core. A reflective material surrounds the core. This material is known as cladding.



Optical fibers are as thin as a human hair. They are usually bundled together.

Optical fiber



A layer called cladding keeps light from escaping out of the core of an optical fiber.

The cladding keeps the light moving through the fiber. Light will move in a straight line easily, but it will not turn a corner without help. As the light moves at a high speed through the core, it bounces off the cladding. If the fiber has a bend in it, the light can bounce off the cladding and turn the corner to follow the bend. The cladding also keeps the light from losing its strength. The light can travel quickly over long distances.

At the end of the fibers is a machine called a receiver. It accepts the light. The receiver turns the light back into sound, pictures, or computer codes.

Most telephone cables used to be made of copper wires. Fiber-optic cables are better than old-fashioned copper wires in many ways. Fiber-optic cables are small and light. They can carry a lot of information with little interference. Fiber-optic cables are also less likely to catch fire than copper wires. However,

fiber-optic cables are expensive. They also break more easily than copper wires.

► **More to explore**

Computer • Light • Telephone

Fibers

Fibers are long, thin strands of material made by plants, animals, or humans. People use fibers to make many useful products. Some examples are brushes, rope, paper, carpets, and textiles (cloth). There are two types of fibers: natural and artificial.

Natural Fibers

Natural plant fibers include rubber and cellulose. Cellulose is the tough part of plants and trees. Natural animal fibers include hair or fur and silk, which caterpillars make to build their cocoons.

Preparing Natural Fibers

Whole natural fibers may be braided, or crossed over and under each other, to make things. For example, people make baskets by braiding grasses, reeds, or twigs. However, many natural fibers are thin or break easily. They must be made thicker and stronger before they can be used to make things. This is done by combining single fibers together.

The most common way of combining fibers is to twist several fibers into thicker threads. People then weave or knit the threads into cloth. People may also form bundles of fibers into yarn, cord, or rope. Felt and paper are made by tangling fibers into a sheet.



Bundles of vegetable fibers from ancient Egypt are displayed in a museum.

Properties and Uses

A natural fiber can be wide and thick or long and thin. It may feel smooth or rough. Some natural fibers are easy to bend, while others are stiff. Silk and cotton fibers are lightweight and soft. Cloth made from these fibers is perfect for clothes, bed linens, and towels. On the other hand, wool can feel rough and itchy. Since wool is very warm, however, it is often used to make sweaters and blankets.

People use natural fibers that are bumpy, rough, and scaly to make heavier objects. For example, straw, jute, and hemp can be woven into mats, hats, rope, and baskets. Bristles (short, stiff animal hairs) work well in hair brushes.

Artificial Fibers

Artificial fibers do not grow in nature. Scientists design them in laboratories, and factories make them out of special chemicals.



An athlete wears clothing made from stretchy artificial fibers.

Making Artificial Fibers

A French inventor made the first artificial fiber, called rayon, in the late 1800s. Rayon is made from plant cellulose that has been changed into liquid form. The liquid cellulose is forced through tiny holes to make long, thin fibers. Acetate and lyocell are other artificial fibers made from plant cellulose.

Scientists later discovered how to make artificial fibers from liquid chemicals. These chemicals mainly come from petroleum (oil) and natural gas. In the 1930s scientists used these chemicals to create nylon. Other artificial fibers made in this way include acrylic, spandex, and polyester.

Properties and Uses

Artificial fibers are strong and tough. Some, especially nylon and spandex, can be stretched like a rubber band. People use them to make clothing, carpets, fur-

niture coverings, rope, and many other products.

Clothing made of artificial fibers became very popular in the 1900s because it was cheaper than clothing made of silk or some other natural fibers. Also, cloth made of artificial fibers does not wrinkle or shrink as cotton does. But cloth made of artificial fibers does not “breathe,” or let air pass through, as much as natural cloth does. This can make such cloth as polyester uncomfortable to wear in hot weather. Many clothes today contain a mixture of artificial and natural fibers. For instance, many cotton jeans and shirts include some spandex so that they stretch better.

► More to explore

Clothing • Cotton • Paper • Silk
• Textile

Fiction

Writers use their imagination to create a kind of literature called fiction. They invent characters, put them in a setting, and give them feelings, words, and



Reading stories can be fun.

adventures. Drama and poetry are also based on imagination, but people usually think of them as separate from fiction. Writing that is based on facts is called nonfiction. Examples of nonfiction include biographies, histories, and cookbooks.

Modern fiction comes in two main forms: the novel and the short story. A novel can tell a long and complicated story. It can have many parts—called chapters—and many characters. A novel is usually published in the form of a book. In the past, however, many novels were first published chapter by chapter in issues of a magazine. A short novel is sometimes called a novella.

Short stories are shorter than novels. They usually have fewer characters and only a few important scenes. Short stories often appear in magazines. Sometimes groups of short stories are collected in books.

► More to explore

Drama • Literature • Poetry

Fig

Fig trees are grown for their small, pear-shaped fruits, called figs. Figs have a sweet, nutty taste. They also have a chewy texture. The fig tree belongs to the mulberry family. Its scientific name is *Ficus carica*.

Figs grow in hot, dry climates. They are commonly found in the region around the Mediterranean Sea. Turkey is the leading producer of figs. Other impor-



Figs ripen on a fig tree.

tant fig-growing countries are Egypt, Greece, Iran, and Morocco. Farmers also grow figs in the United States, mainly in California.

The fig tree has broad, rough leaves. The tree may be from about 3 feet (1 meter) to 39 feet (12 meters) tall.

The figs that grow on the tree are called fruits, but they are actually inside-out flowers. Each fig is hollow and filled with tiny buds. Seeds sometimes develop from these buds. The skin of a fig may be brown, purple, yellow, or green.

People have been growing figs since at least 5000 BC. They were an important source of food for the ancient Greeks and Romans. Today people eat figs fresh or dried. Most figs sold in stores are dried because the fruit spoils very easily. They also may be canned or used as an ingredient in cookies, pies, or breads. Figs are very nutritious. They contain many important minerals.

Fiji

The country of Fiji is a group of about 300 islands in the South Pacific Ocean. People live on only about 100 of the islands. The capital is Suva.

Geography

Fiji's islands are scattered over about 1 million square miles (3 million square kilometers). Mountains rise sharply from the coasts of the largest islands. Coral reefs surround many of the islands. Each year, Fiji has a hot, wet season and a cooler, drier period.

Plants and Animals

The larger islands have thick tropical forests and mangrove swamps on their eastern sides. Dry grasslands cover the western sides. Most of Fiji's animals, including pigs, dogs, cattle, and horses, are domesticated, or owned by people.

People

Native Fijians make up about half of the population. They are mostly Christians. Most of the rest of the people's ancestors



came from India. Most of Fiji's Indians are Hindus. English, Fijian, and Hindustani are the official languages.

Economy

Fiji's main economic activity is tourism. Fiji also produces clothing, sugar, and gold. Agriculture employs the most people, however. Fiji's main crops are sugarcane, coconuts, taro, cassava, rice, bananas, and sweet potatoes.

History

Fiji's first settlers arrived from other Pacific islands at least 3,500 years ago. Great Britain made Fiji a colony in 1874. The British brought thousands of people from India to work on their sugar estates.

Fiji gained independence in 1970. Since then, tensions between native Fijians and Indians have led to several changes in the government.

► More to explore

Oceania • Suva



Facts About FIJI

Population
(2008 estimate)
839,000

Area
7,055 sq mi
(18,272 sq km)

Capital
Suva

Form of government
Republic

Major towns
Suva, Lautoka,
Nadi, Labasa,
Nausori

Fiji is an archipelago, or group of islands. No people live on most of its islands.



Fillmore, Millard

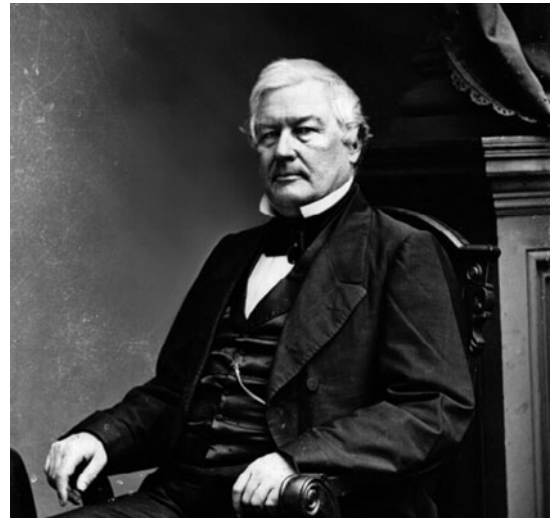
After the death of President Zachary Taylor in 1850, Vice President Millard Fillmore became the 13th president of the United States. Fillmore worked to make a compromise between antislavery Northerners and proslavery Southerners. His efforts led to the breakup of his political party, the Whigs.

Early Life

Millard Fillmore was born in a log cabin in Locke Township, New York, on January 7, 1800. His family was poor. Millard did not attend school regularly because he had to work. After working in a law office, he became a lawyer in 1823. In 1826 Fillmore married Abigail Powers. They had two children.

Political Career

In 1828 Fillmore was elected to the New York legislature. He later served several terms in the U.S. House of Representa-



Millard Fillmore

tives. In 1834 he joined the Whigs, a new political party.

In 1848 the Whigs nominated Fillmore as a candidate for vice president. He and presidential candidate Taylor won the election.

Presidency

Fillmore became president when Taylor died in 1850. The country was close to civil war over the slavery issue. Fillmore



TIMELINE

Fillmore is born in New York State.

January 7, 1800

Fillmore angers Northern states by supporting proslavery laws.

1850

Fillmore becomes president after Taylor dies.

July 9, 1850

1852

Fillmore appoints Matthew Perry to head an expedition to Japan.

Fillmore fails to win a second term.

1852

Fillmore loses election for president as a member of the Know-Nothing Party.

1856

Fillmore dies in Buffalo, New York.

March 8, 1874

personally opposed slavery, but he wanted to preserve the Union. He supported the Compromise of 1850, a series of laws that tried to satisfy the North and the South. One of those laws, the Fugitive Slave Act, said that the federal government must help return runaway slaves to their owners. Fillmore's support of that law angered many Whigs in the North.

In foreign affairs, Fillmore helped world trade by sending an expedition to Japan. The trip led to a treaty that opened Japanese ports to U.S. ships.

Defeat and Retirement

The Compromise of 1850 postponed the American Civil War for 10 years. It also ended Fillmore's political career. In the 1852 presidential election Fillmore and two other Whig candidates lost. In 1856 Fillmore unsuccessfully ran for president as a member of the American, or Know-Nothing, Party.

Fillmore retired to Buffalo, New York. He died there on March 8, 1874.

► More to explore

Slavery • Taylor, Zachary • United States

Finch

Finches are a family of small songbirds. There are several hundred species, or kinds, of finch. They include the canary, the cardinal, goldfinches, and sparrows. Most finches are excellent singers, and many kinds are kept as pets.



The American goldfinch is also called a wild canary. It lives in North America.

Finches live in mild areas in the northern half of the world. They also are found in South America and Africa. In many places finches outnumber all other birds.

Finches are small birds. They range in length from 4 to 11 inches (10 to 28 centimeters). Many have bright colors, often with different shades of red and yellow. Males are usually more colorful than females.

Finches eat the seeds of grasses and weeds. Most use their cone-shaped bills to crack the seeds. Many finches eat insects as well.

Female finches build a nest of twigs, grasses, and roots on the ground or in bushes. Then they lay four or five eggs. Usually the male helps to raise the young birds, called nestlings.

► More to explore

Canary • Cardinal • Songbird • Sparrow



Finland

Finland is a country of northern Europe. For much of its history it was controlled by the neighboring countries of Sweden and Russia. It won its independence in 1917. Today Finland has close ties to its European neighbors. The capital and largest city is Helsinki.

Geography

Finland is bordered by Sweden, Norway, and Russia. The Baltic Sea forms its long coastline. Finland also includes the Åland Islands, which lie off the southwestern coast.

Most of Finland is composed of lowlands, but the northwest is mountainous. Forests cover about three fourths of the land. Finland also has more than 50,000 lakes and numerous rivers. Winters are long and very cold, especially in the north.



The Sami people of Finland have used reindeer to pull their sleds for many years.

Plants and Animals

Pines, spruces, and other evergreens fill Finland's vast forests. The trees of the northern forests are often small in size because of the poor growing conditions. Lichens, moss, and cloudberries grow in the northern swamps. Broad-leaved birch, hazel, and aspen trees grow in the extreme south.

Finland's forests are home to bears, elk, wolves, wolverines, and lynx. The Sami people raise herds of reindeer in the north. The country's birds include Siberian jays, pied wagtails, eagles, and sea-birds. Salmon, trout, whitefish, herring, perch, and pike swim in Finland's waters.

People

More than 90 percent of the country's people are ethnic Finns who speak Finnish. Ethnic Swedes form the largest minority group. There are also a few thousand Sami, or Lapps. Their terri-



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tory, called Lapland, stretches across northern Finland, Sweden, Norway, and Russia. More than 85 percent of the people are Christians, mainly Lutherans. Most people live in cities in the southern third of the country.

Economy

Finland has a diverse economy centered around manufacturing and services, which include banking, communications, education, and health care. Manufacturers produce electronics, paper and wood products, machinery, metals, processed food, and chemicals. Finland's forests provide timber. Its mines provide chromite, zinc, and gold.

Agriculture plays a small role in the economy. Major crops include barley, oats, sugar beets, potatoes, and wheat. Pigs and cattle are the main livestock. Reindeer herding is important in the north. Finland's waters offer good fishing.

History

The first settlement of Finland began about 10,000 years ago. The settlers included the ancestors of the Sami. In the 1100s the Swedes began to convert the Finns to Christianity. Sweden and

Russia fought for political and religious control of the region for many years. The Swedes took over Finland in 1323.

Russia defeated the Swedes in 1721, but Sweden did not officially surrender Finland to Russia until 1809. In 1917 the Russian Empire collapsed as a result of the Russian Revolution. Finland declared itself independent that year. It became a republic in 1919.

World War II (1939–45) was disastrous for Finland. The country lost large pieces of territory to the Soviet Union at the beginning of the war. In 1941 Finland sided with Germany against the Soviet Union and won back its lost territory. However, Soviet forces again defeated Finland in 1944. Finland was forced to give up more territory.

After the war, the economy grew and social conditions improved. Finland joined the European Union in 1995. In 2000 Tarja Halonen was elected Finland's first woman president.

► More to explore

European Union • Helsinki



Olavinlinna Castle in Finland is on an island near the border with Russia.

Facts About FINLAND



Population
(2008 estimate)
5,310,000

Area
130,559 sq mi
(338,145 sq km)

Capital
Helsinki

Form of government
Republic

Major cities
Helsinki, Espoo,
Tampere, Vantaa,
Turku, Oulu

Fir



Firs have needlelike leaves that grow directly from the branch.

Firs are evergreen trees of the pine family. They are valued for their wood and are popular as Christmas trees. There are more than 40 species, or types, of fir. They belong to the group that scientists call *Abies*.

Firs grow in moist, cool areas of North and Central America, Europe, Asia, and northern Africa. In North America many firs grow in the mountains of the West. The balsam fir is a well-known type in eastern North America.

Fir trees can be anywhere from 17 feet (5 meters) to 200 feet (60 meters) tall when fully grown. The leaves are like needles. Each needle grows singly from the branch. This makes firs different from pines, which have needles that grow in bundles. Fir needles are bright green to blue-green on the top and

white or silvery green on the bottom. They are flat and usually have rounded tips.

Firs belong to the group of plants called conifers. Conifers have cones that hold their seeds. Fir cones stand up on the branches like candles. They may be purple, brown, or green.

Many evergreen trees that do not belong to the group *Abies* are also called firs. For example, Douglas firs belong to the group *Pseudotsuga*. Unlike the true firs, Douglas firs have cones that hang down. These trees are common in North America along the coast of the Pacific Ocean. They are a valuable timber tree.

► More to explore

Conifer • Pine • Tree

Fire

Humans have controlled and used fire for more than 1 million years. Civilization would not be possible without fire.



Many people have fireplaces in their homes. They enjoy looking at the fire as well as the warmth that it provides.



Fire is used in many factories to operate furnaces or heat boilers. In a steel mill it is used to melt the materials that go into making steel.

However, fire is dangerous. It always must be used very carefully.

How Fire Happens

Fire comes about when oxygen combines in a certain way with some other substance. Oxygen is a gas that is a part of air. The other substance is called the fuel. For the fuel to combust, or burn, it must be heated to a temperature called the ignition point. Every kind of fuel has its own ignition point.

A flame is created when heat forces gases from a burning substance. When the gas from a candle's hot wax meets the air, for example, a flame is made. A substance that does not release gas when heated will burn without flames. When the oxygen is used up, the fire will go out. For example, when a candle's flame is covered, the flame will go out after it has used the remaining oxygen in the space beneath the cover.

History

Human beings have known how to control fire for almost 1.5 million years. But for many thousands of years after that, people still found it difficult to start a fire. One method they used was to strike one hard mineral against another to make sparks. A second method was to twirl one piece of wood against another until the wood heated up to its ignition point.

Early humans had many uses for fire. Campfires kept people warm and scared off wild animals. Fire lit the way at night and in caves. Fire also cooked food.

Eventually, people used fire in new ways. They set fires to clear land for farming. They used fire to make pottery from clay. By about 3500 BC people were using fire to shape metals. As the centuries passed, people learned to use fire to make such things as steam, rubber, and bricks.

► More to explore

Civilization • Combustion

Firefighting

Fire is useful to humans, but it is dangerous as well. Fires kill thousands of people each year and destroy much property. The people who put out fires are called firefighters. Firefighters also work to prevent fires and teach fire safety.

A fire must have fuel, oxygen, and heat in order to burn. Firefighters put out fires by removing at least one of those

Did You Know?

Early humans did not know how to start a fire. They had to get fire from trees struck by lightning or from volcanic eruptions.



Firefighters wear protective clothing because their work is sometimes dangerous.

three ingredients. For example, they take fuel away from a forest or brush fire by clearing away trees and bushes in the path of the fire. They take oxygen away from a grease fire by smothering it with foam from a fire extinguisher. They reduce the heat of a burning building by spraying water over it.

Fire departments (also called fire brigades) date back to ancient Rome. Today almost all large and medium-sized cities have full-time fire departments. Volunteers staff many small fire departments.

Firefighters use several kinds of equipment at a fire. Pumper trucks carry powerful pumps and long hoses to shoot water at the fire. Ladder trucks and elevating platforms are equipped to rescue people and fight fires in tall buildings. Tanker trucks carry water to places that have no water pipes nearby. Airplanes and helicopters are used to drop water or chemicals on forest fires. Many fire departments also provide ambulance service for fire victims.

Deaths from fires have dropped in recent years. More buildings now use construction materials that do not burn easily. And more buildings now have automatic water sprinklers. However, in case a fire does break out, people should know how to contact their fire department. They also should know where emergency exits are and how to escape a burning building safely. Plus, every home should have fire extinguishers.

► More to explore

Ambulance • Combustion • Fire

Firefly

In many places the insects called fireflies are a familiar sight on summer nights. They are noticeable because they can produce flashes of light. Fireflies belong to the beetle family. They are also called lightning bugs.

There are about 1,900 species, or types, of firefly. They live in tropical and mild parts of the world. They generally like warm, humid areas, but some live in dry places.



A firefly lights up.

Adult fireflies range in size from 0.2 to 1 inch (5 to 25 millimeters) long. They have a soft, flattened body that is dark brown or black, sometimes with orange or yellow marks. Males have wings and are good fliers. Females either have short wings or no wings. The females without wings are often called glowworms. Young fireflies, which also have no wings, are also called glowworms.

Fireflies produce light with special organs, or body parts, on the underside of the body. These organs make light by mixing chemicals with oxygen from the air. Fireflies make a certain series of flashes to attract a mate. When a possible mate sees the flashes, it returns the signal.

► More to explore

Beetle • Insect

Fish

Fish are a kind of animal that lives in water. Fish have lived on Earth for more than 450 million years. There are more than 24,000 species, or kinds, of fish. New ones are discovered every year.

Where Fish Live

Fish live in lakes, rivers, seas, and oceans around the world. They live in all kinds of water, from warm springs to cold Arctic seas. Fish can even be found in the dark pools of underground caves.

Physical Features

The many different kinds of fish have some things in common. They are all



Yellowspot emperor fish swim in a group called a school.

vertebrates, which means that they have a backbone. They are cold-blooded, which means that their body temperature changes along with the temperature of their surroundings. Fish generally breathe through organs called gills. They usually have pairs of fins in place of arms and legs. Most fish are covered with scales.

But fish also show great variety. Gobies, the smallest fish, can be less than half an inch (13 millimeters) long. The whale shark, the largest fish, can be 50 feet (15 meters) long and weigh 20 tons. A typical fish is wider in the middle than at the ends. But a flounder is as flat as a dinner plate. A sea horse looks something like a horse standing on its tail. Eels look like snakes.

Over millions of years, some fish have developed unique features to help them survive. These features are called adaptations. For example, the anglerfish carries its own “fishing rod” to catch other fish. An extended part of the back fin has wormlike pieces of flesh at the tip,



A diver swims with a whale shark, the largest of all living fish. The whale shark is harmless to humans.

which are the “bait.” Anglerfish of the deep sea have bait that lights up to attract victims.

Behavior

Fish swim mainly by sideways movements of the body and tail. They use their fins for balancing, steering, and braking. To move quickly from a resting position, some fish shoot a stream of water out of the gills, which causes them to lunge forward. The fastest swimmers, such as the tuna, can travel 30 miles (48 kilometers) per hour.

Many fish have adaptations to help protect them from enemies. For example, some fish have spots near their tail that look like eyes. When an enemy strikes at what it thinks is the head, the fish can escape quickly. Other fish can change color and pattern to match their surroundings and hide themselves from enemies.

Most fish eat other, smaller fish. The smallest fish eat tiny water plants and

animals called plankton. Plankton also includes fish eggs. It drifts with the currents in large numbers.

Reproduction

All fish hatch from eggs. Usually the females release eggs and the males release sperm into the water. When the eggs and sperm meet, the eggs are fertilized. Many of the eggs, and the young that hatch from them, are eaten by other fish. To increase the chance that some young will survive, some females release as many as a million eggs.

Some kinds of fish try to protect their eggs. The female might dig a nest in the sandy bottom and lay her eggs there. The female sea horse lays her eggs in a pouch on the belly of the male, where they stay until they hatch. Some male catfish carry the eggs in their mouth.

Sometimes the eggs are fertilized in the female’s body and hatch there. Then the young are born live from the female. Fish born this way have a better chance



An anemone fish shelters in the tentacles of a poisonous sea anemone. The poison does not hurt the fish.

of survival. Guppies and some sharks have live births.

Fish and Humans

Fish are valuable to people in a number of ways. In many places fish are a major source of food. Also, people keep fish as pets in home aquariums. Some people enjoy fishing as a sport. However, too much fishing by commercial boats has greatly reduced the number of certain fish. Fish are also harmed by pollution.

► More to explore

Adaptation • Catfish • Eel • Plankton
• Protective Coloration • Sea Horse
• Shark • Tuna

Flag

A flag is a piece of cloth or other material that carries a design. A flag is often attached on one side to a pole or a stick,

called a staff. Every country and state has its own flag. Some cities, groups, and people have flags as well.

A flag is a powerful symbol. People show a flag the same respect that they show to the country or group it represents. Many governments have laws about flag use.

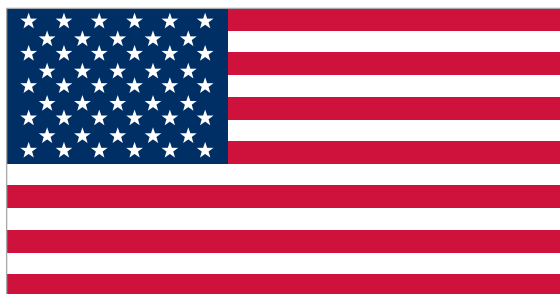
Flags of Countries

Betsy Ross may have sewn the first U.S. flag in 1776. Since then the U.S. flag has changed many times. The flag now in use has 50 stars that stand for the 50 states. Its 13 stripes stand for the 13 original states. However, no state has its own particular star or stripe.

The flags of other countries also have meanings. Most flags of Islamic countries use the crescent moon, the color green, or both. These are symbols of

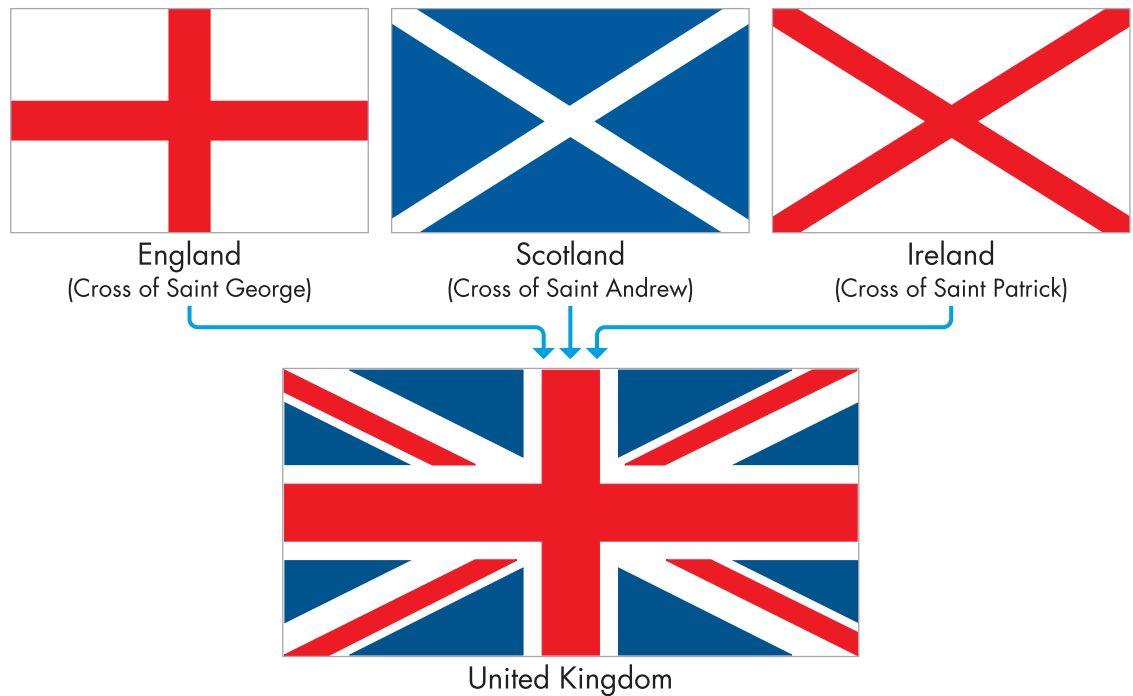


13 stars, 1777–95



50 stars, 1960

The earliest U.S. flags had the 13 stars arranged in different patterns. A new star was added for each new state that joined the country. Since 1960 U.S. flags always have the same pattern of 50 stars.



The modern flag of the United Kingdom combines symbols of England, Scotland, and Ireland.

Islam. Many of the traditionally Christian countries of Europe have a cross (the symbol of Christianity) on their flags.

numbers or letters. People use sets of these flags to send messages over a distance.

Special Flags

Flags may serve special purposes. A flag honors the dead when it flies halfway down the pole. A yellow flag is a warning of contagious, or catching, disease. A white flag in a battle is a call to stop the fighting. An upside-down flag on a ship is a call for help. Some flags have designs that stand for

Flag History

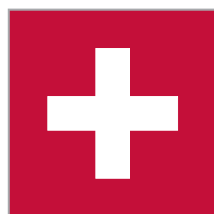
The people of ancient China and India used some of the first flags. These early flags often flew over armies in battles. If a flag fell, it meant that the commander had been captured or killed.

Ancient Roman soldiers on horseback carried a square piece of fringed cloth at the end of a spear. Later, European

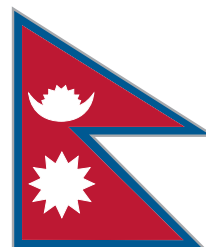
Flag Shapes



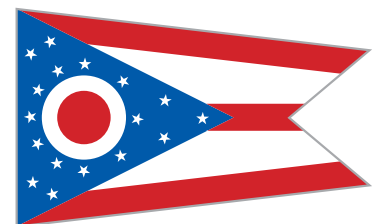
Algeria



Switzerland



Nepal



Ohio

Most flags are rectangular. But some flags are squares, triangles, or other unusual shapes. The shape of the flag of the U.S. state of Ohio is called swallow-tailed.



An illustration shows many flags on a ship from Venice, Italy, in the year 1298.

countries used flags to represent themselves. By the end of the Middle Ages in about 1500, cities and guilds (groups of skilled workers) also had flags.

► More to explore

Ross, Betsy

Flamingo

Flamingos are tall, mostly pink birds with long legs. A flamingo often stands with its long, thin neck curved into an S shape. Flamingos fly and feed in large flocks of hundreds to even millions of birds.



Flamingos are known for their pink color and curved necks.

Like storks, herons, and ibises, flamingos are wading birds. This means that they feed while standing or walking in shallow water. Flamingos live in warm regions near lakes and bodies of water called lagoons.

There are five species, or types, of flamingo. The most common type is the lesser flamingo. It is found mainly in eastern and southern Africa and India. Other types of flamingo come from Central and South America, Caribbean islands, southern Europe, Africa, the Middle East, and southern Asia.

A flamingo has webbed feet, a slender body, large wings, and a short tail. Its head is small, and its bill curves downward. It stands between about 3 feet (almost 1 meter) and 5 feet (1.5 meters) tall.

Flamingos eat tiny living things such as algae and small animals such as shrimp, snails, crabs, and mollusks. A flamingo gets its food by plunging its head down into shallow water or mud. It twists its head upside down and sucks water into its bill. The bill has a series of hairlike plates inside that act as a filter. The bird uses its bill to strain food from the water.

► More to explore

Bird • Heron • Ibis • Stork

Flathead

The Native Americans known as the Flatheads traditionally lived in what are now western Montana and eastern

Did You Know?

When first hatched, a flamingo has white and gray feathers. Its color changes to pink because of the food it eats.



Charlot was a great chief of the Flatheads in the 1800s.

Idaho. They called themselves the Salish. This name is now used for a group of tribes that speak similar languages. Outsiders called them Flatheads even though they did not flatten the foreheads of their babies with boards, as some related tribes did.

The Flatheads got most of their food by hunting and fishing. By the early 1700s they obtained horses. They then traveled long distances on horseback looking for bison (buffalo).

Flathead families lived in long houses or tepees. They made their long houses by covering wooden poles with bark or woven mats. They covered their tepees with grass, bark, or earth.

In the 1700s many Flatheads died of smallpox, a disease that European explorers passed on to the tribe. Many other Flatheads were killed in wars with other tribes. In 1855 the U.S. government forced the surviving Flatheads to move to two small reservations. Later

the tribe was forced to give up one reservation. This left them with only the Flathead Indian Reservation near Missoula, Montana. Today they share its land with several related tribes. At the end of the 20th century there were about 3,500 Flatheads.

► More to explore

Native Americans • Smallpox

Flea

Fleas are insects that live as parasites on birds and mammals, including humans. Like other parasites, fleas depend on the animal they live on for food. Fleas bite the animal to feed on its blood. They can spread diseases by biting an infected animal and then biting a healthy animal.

Fleas live throughout the world, in polar, mild, and tropical regions. There are about 1,600 species, or kinds, of flea.

Fleas are tiny. The largest are only about 0.4 inch (1 centimeter) long. Fleas have a thin, flattened body that is dark reddish brown. They use their long, sharp beak to pierce an animal's skin and suck its blood. Fleas do not have wings, but they have strong legs and are excellent jumpers.



A flea settles into the fur of a dog.

A flea has four stages of life: egg, larva, pupa, and adult. A female flea can lay more than 20 eggs every day. An egg develops into a larva, which looks like a legless caterpillar. The larva molts (sheds its outside covering) two or three times. Then it spins a cocoon to begin the pupa stage. The pupa develops into an adult a few days or months later, depending on the species. Adult fleas live for a few weeks to about a year.

► More to explore

Insect • Parasite

Flood

When water overflows onto dry land, a flood takes place. Floods have always been a part of life on Earth. Almost every culture has a legend about a great flood. Since ancient times people have built their cities along rivers because they use the water for drinking and for farming. River floods therefore affect many people. In some places people have built dams or levees to protect lands from river flooding.

Floods can be dangerous and destructive. However, floods are not always bad. When muddy floodwaters go down, they sometimes leave a layer of rich, moist soil. People in ancient Egypt depended on the flooding of the Nile River every year to help them grow their crops.

Causes

Most often flooding is caused by heavy rains over a long period of time. After a lot of rain, the ground becomes full of water, and new rainwater runs off, or



Cars are useless in a flooded street.

flows downhill. That runoff goes directly into streams and rivers. In springtime the rain may be combined with melting snow. Because of the extra water flowing into the streams and rivers, their water level rises. If the level rises so much that the water overflows the banks, a flood occurs.

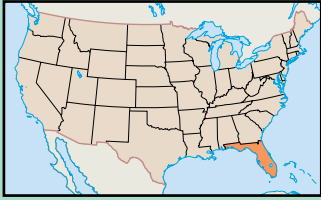
Flooding can be worse if there is not much vegetation (trees, grass, and other plants) on the land around rivers. In general, land that has little vegetation is less able to absorb water. The result is a larger amount of water entering a river system.

Flash Floods

Flash floods are the deadliest kind of flood. They are caused by sudden heavy rainfall or a broken dam. They happen very quickly and can catch people before they have a chance to escape. Flash floods often occur in hilly country or around dry riverbeds. In a flash flood a completely dry riverbed can fill up in minutes.

► More to explore

Dam • Levee and Dike



Florida

The U.S. state of Florida is nicknamed the Sunshine State

because it has so many sunny days. Other nicknames include the Orange State, the Peninsula State, the Alligator State, the Southernmost State, and the Everglades State. Its actual name is the Spanish word for “flowery.” The capital is Tallahassee.

Geography

Florida is on the southeast coast of the United States. Georgia and Alabama border the state on the north, above the area of Florida known as the Panhandle. The Atlantic Ocean is on the east. On the west are Alabama and the Gulf of Mexico.

The Straits of Florida connect the Gulf of Mexico and the Atlantic Ocean. This body of water also separates Florida from Cuba. The Florida Keys are a chain of tiny coral and limestone islands. Key West, on the Florida Keys, is the coun-



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An alligator lies near a tram full of tourists in Everglades National Park, Florida.

try's southernmost city (outside Hawaii).

Flat plains border the entire coast. In the center of the state broad plains, rolling hills, and thousands of lakes stretch from the Georgia border south through the center of the state. A low plateau rises in the northwest. Forests once covered most of Florida's land area, but many trees were cut down to build cities. In the south lies Everglades National Park. The park is a vast wilderness area of swamps and forests. The state's largest rivers are all in the north. The Saint Johns River is the longest, stretching for 285 miles (459 kilometers).

Florida is known for its warm, sunny climate. While cold spells sometimes occur in the winter, they rarely last more than three or four days. The heaviest rainfall occurs between May and October. Hurricanes can be a problem.

People

Florida has a diverse population. Many senior citizens move to Florida after their retirement to enjoy the weather.

People from nearby island countries such as Cuba and Haiti sometimes go to Florida to escape political or economic problems. Hispanic Americans make up more than 15 percent of Florida's residents. About the same percentage of people are African Americans. Some Seminole Indians live on reservations in southern Florida. The rest of the population is primarily of European descent.

Jacksonville is the largest city in the state. It is a seaport and business center. Miami, the second largest city, is a winter resort and a manufacturing center. Tampa is a port on the Gulf of Mexico.

Orlando is a popular vacation spot. It has many theme parks, including Walt Disney World and Sea World. Many cities, including Key West, Palm Beach, Fort Lauderdale, and Daytona Beach, attract visitors with their beaches.



Many people gather at sidewalk cafés in the South Beach section of Miami, Florida.



A group of children examine starfish in the clear waters near Honeymoon Island. The island is one of the many popular recreational areas in the U.S. state of Florida.

Economy

Trade and tourism bring a great deal of money into Florida's economy. Many people hold service jobs, including at hotels and restaurants, as well as at finance and insurance companies. Companies in Florida manufacture food and paper products, electronics, and chemicals. Florida is also a leader in the aerospace industry. The John F. Kennedy Space Center at Cape Canaveral employs thousands of people.

Crops grow year-round in Florida. Florida is a leading grower of citrus fruits, including oranges and grapefruits. Farmers also grow other fruits, vegetables, tobacco, cotton, and sugarcane. They raise cattle, poultry, and horses. Fishers catch fish and shellfish in Florida's many waters.

History

When the explorer Juan Ponce de León arrived in Florida in 1513, he claimed the land for Spain. In 1528 another

Facts About FLORIDA

Flag



Population

(2000 census),
15,982,378—
rank, 4th state;
(2008 estimate)
18,328,340—
rank, 4th state

Capital

Tallahassee

Area

65,755 sq mi
(170,305 sq
km)—rank, 22nd
state

Statehood

March 3, 1845

Motto

In God We Trust

State bird

Mockingbird



State flower

Orange blossom



The space shuttle *Discovery* launches from the John F. Kennedy Space Center at Cape Canaveral, Florida, in July 2006.

Spanish explorer named Pánfilo de Narváez reached Tampa Bay. Hernando de Soto sailed into Tampa Bay in 1539.

In 1562 French Protestants called Huguenots went to Florida so that they could freely practice their religion. More French colonists followed, but many of them were killed when Spanish explorer Pedro Menéndez de Avilés captured their fort. In 1565 Menéndez founded Saint Augustine, the first permanent European settlement in what is now the United States.

Spain gave Florida to Great Britain in 1763. Spain regained control after the American Revolution ended in 1783. Then the United States and Spain disagreed on land boundaries in Florida. In 1819 Spain finally agreed to give up Florida. Meanwhile, the United States

began fighting the Seminole Indians of Florida. By 1858 most of the Seminole had been forced to move west.

Florida entered the Union in 1845 as the 27th state. In 1861, at the beginning of the American Civil War, it left the Union to join the Confederacy because many of its citizens supported the right to own slaves. Florida was readmitted to the Union in 1868.

In the 1880s railroad building opened the state to settlers and a new tourist trade. Better transportation made Florida the winter vegetable and citrus center of the East. In the 1900s many more people moved to Florida. The state prospered as the economy grew.

► More to explore

• Seminole • Tallahassee

Florida Keys

The Florida Keys are a chain of about 60 islands off the coast of southern Florida. The chain begins in the Atlantic Ocean just south of Miami Beach. From there it curves southwestward into the Gulf of Mexico. The chain is about 220 miles (355 kilometers) long.

The largest of the keys is Key Largo. It is about 30 miles (48 kilometers) long and less than 2 miles (3 kilometers) wide. Key West is a small island at the western end of the chain. The city of Key West spreads over the island. It is the southernmost city in the United States outside of Hawaii.

Mangrove trees line the shores of the keys. Tropical hardwood trees and palms grow on higher ground. More than 600 types of fish live in the waters around the keys. John Pennekamp Coral Reef State Park, off Key Largo, contains the largest living coral formations in North America.

Tourism and fishing are the most important economic activities of the keys. A



The western keys of Key West, Florida, are made of limestone. The eastern keys are made of an old coral reef.

road called the Overseas Highway connects all of the main islands.

► More to explore

Florida • Mexico, Gulf of

Flower

A flower is the part of a plant that blossoms. Flowers produce the seeds that can become new plants. Most plants, including many trees, grow some kind of flower.

Physical Features

Flowers vary widely in their shape, size, color, and scent. Many types are small and barely noticeable. The blossoms that most people think of as flowers are those that are colorful and showy.

A flower usually has four main parts. These are the calyx, the corolla, the stamens, and the pistils. All of these parts are usually bunched together at the tip, or receptacle, of the flower stem.

The calyx is the outermost part of a flower. It is made up of sepals. The sepals are usually green and look like small leaves. The sepals enclose and protect the flower bud while it is developing into a flower.

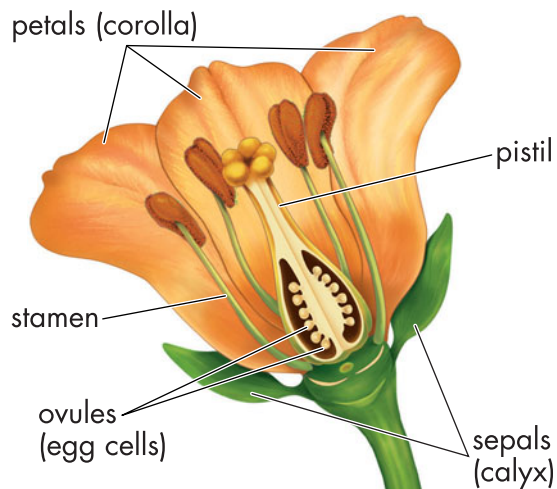
The flower's petals form the corolla. Within the corolla are the stamens and the pistils. The stamens are the male parts of a flower. They produce tiny grains called pollen. Pollen grains contain sperm cells. The pistils are the female parts of a flower. The pistils contain egg cells that can develop into seeds. Some flowers have both stamens and pistils. Others have either stamens or pistils.

Pollination

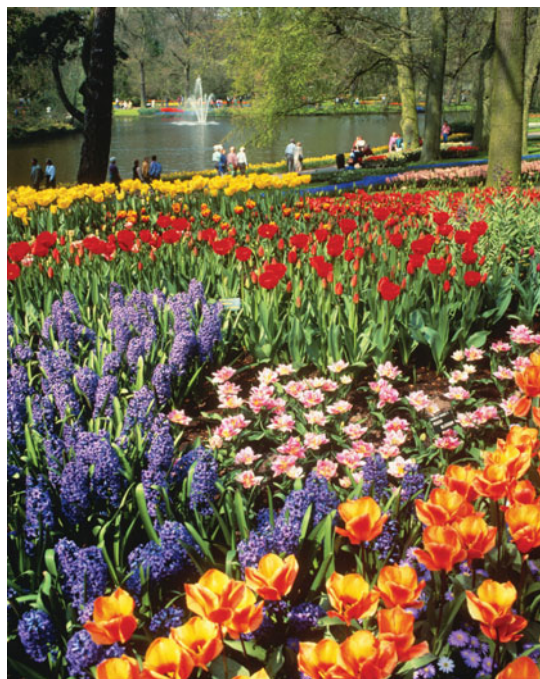
Pollination is the process by which flowers form seeds. This is how plants reproduce.

There are two main kinds of pollination: self-pollination and cross-pollination.

Parts of a Flower



The main parts of a flower are the calyx, the corolla, the stamens (male parts), and the pistils (female parts). Some flowers have only stamens. Others have only pistils.



A garden in The Netherlands features flowers of many shapes and colors.

Self-pollination is the transfer of pollen from a stamen to a pistil on the same plant. This can happen within one flower or between different flowers on the plant. Cross-pollination is the transfer of pollen from a flower on one plant to a flower on another plant.

Flowers depend on carriers for cross-pollination. Carriers are things that carry pollen from one plant to another. They include the wind, insects, birds, and other animals.

After a grain of pollen lands on a flower's pistil, fertilization occurs. That is, a sperm cell from the pollen enters the egg cell in the pistil. The fertilized egg then grows into a seed.

Uses

Flowers are symbols of beauty in most cultures of the world. Many people give

flowers as gifts. People also use flowers as decorations during holidays and at weddings and other ceremonies. Flowers with a lovely scent may be made into perfume.

► More to explore

Plant • Pollen • Seed

Fly

Many kinds of small flying insects are commonly called flies. But scientists use the term fly only for the insects in a group they call Diptera. These “true” flies usually have a single pair of wings. Most other insects, including some that are called flies, have two pairs of wings. Instead of a second set of wings, true flies have knoblike structures that help them balance while flying.

There are about 85,000 species, or kinds, of fly. They include houseflies, horseflies, fruit flies, gnats, and mosquitoes. Flies live everywhere in the world except near the ice caps of the North and South poles.

Flies range in size from just 0.05 inch (1 millimeter) to 3 inches (8 centimeters) long. The common housefly is about 0.25 inch (0.64 centimeter) long. It has three pairs of legs and five eyes. Two of the eyes cover most of the head.

Flies eat a variety of things. Most get food from flowers. This food includes the dustlike substance called pollen and the syrupy liquid called nectar. Flies feed on living plants as well as rotting plants and animals. Flies that can bite, such as



A housefly feeds on a doughnut.

mosquitoes, suck blood from animals. Flies also eat dung.

Flies can be very harmful. They can spread diseases by carrying germs on their hairy bodies. Some flies can spread disease through their bites. Flies can also damage crops.

► More to explore

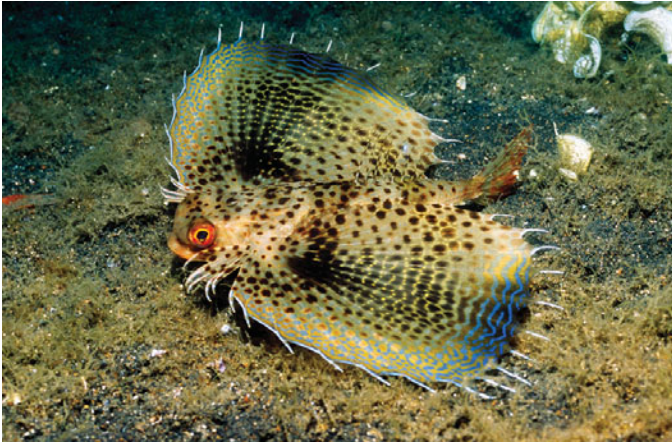
Disease, Human • Insect • Mosquito

Flying Fish

The unique fishes called flying fish appear to soar above the water. But they do not actually fly by flapping wings, like birds do. Instead, they jump from the water and use their fins to glide through the air.

Flying fishes live in warm seas throughout the world. There are about 40 different species, or types.

Flying fishes are usually less than 18 inches (45 centimeters) long. The typical flying fish is deep blue on the back and sides and silvery underneath. It has



A flying fish shows the fins that it uses to soar in the air.

a long, narrow body with large, winglike fins attached to the sides. Some species also have fins on the underside of the body.

Scientists believe that flying fishes “fly” to escape predators. To do so, the fish first builds up speed underwater. It folds its fins against its body while swimming toward the surface. As the fish breaks the surface it spreads its fins, which act as wings. It also rapidly beats its tail, which is still underwater. This lifts the fish out of the water and lets it glide above the surface. Some fish can go as far as 600 feet (180 meters) in a single glide.

► More to explore

Fish

Fog

Tiny water drops hovering in the air are called fog. Fog is like a cloud, but it is near the ground, not high in the sky. Thick fog makes it difficult to see the surrounding landscape.

Fog forms from water vapor, which is water in the form of a gas. Water vapor in the air condenses, or turns back into liquid, when the air cools. Fog appears when this liquid gathers around bits of dust in the air. A gentle wind helps fog to form and to stay in the air. If the water vapor condenses on the ground instead, it is called dew.

Fog is very common in valleys and near bodies of water. It usually forms at night, when the air cools down. As the air warms in the morning, the fog evaporates, or dries up. In colder places fog may last all day. Wind and tall objects, such as trees and buildings, can break fog into patches.

Fog also forms when warm air blows slowly over a cool ocean or a lake. This kind of fog can also develop over snow or ice. Cold air passing over warm land or water may also form fog, as can rain falling from warm air to cool air near the ground.

► More to explore

Cloud • Dew • Water



Fog forms in a valley.

Folk Music

The music and songs of common people are called folk music, or traditional music. Folk music exists around the world, often in rural areas.

Most folk music includes singing and instrument playing. There are many forms of folk songs. A ballad tells a story. A lullaby is a child's bedtime song. A spiritual is a religious song. Folk musicians use many kinds of instruments. Some are simple, such as rattles and whistles. Others, such as fiddles and guitars, are also used to play classical music.

Once a person makes up a folk song, people in the community learn it. No one writes down the song at first, so people often change it as they perform it. The song may spread to nearby towns and even other countries, where it changes further. Regions in Europe, for example, all have their own styles of folk music, but many of the tunes are similar.



Young folk musicians perform in Budapest, Hungary.

European immigrants and African slaves brought folk music to the Americas. In colonial America and the early United States, folk music was an important part of daily life. Pioneers sang as they traveled west. Slaves sang in the cotton fields of the South. Workers sang as they laid railroad tracks. Cowboys sang as they herded cattle.

In the 1960s a new kind of folksinger developed. Popular musicians, such as Bob Dylan, sang traditional folk songs and mixed folk music with rock and roll. These singers made folk music popular with young people.

► More to explore

Music • Musical Instruments

Folktale

Folktales are a kind of story that gets passed on from generation to generation. True folktales do not have a single author. They develop as different people tell them over time. As such, they are creations of “the folk,” or the people. Many folktales are very old. For generations the tales were spoken aloud and never written down. Storytellers would memorize the stories and keep them alive.

Modern authors may write their own versions of popular kinds of traditional tales, such as fables and fairy tales. Also, folktales that began as ancient spoken stories may now be written down in books. For example, the stories called the *Arabian Nights* were told aloud long ago in many places in the Middle East

Did You Know?

European art music, also known as classical music, often borrows tunes from folk music.

Did You Know?

A collection of Indian folktales about animals called the *Panchatantra* was written perhaps 2,000 years ago.

and elsewhere. A variety of entertaining stories in the group tell of characters such as Aladdin, Ali Baba, and Sinbad the Sailor. People began collecting and writing down these colorful tales more than 1,000 years ago.

Subjects

Folktales tell about many different parts of life. They may tell about joys and sorrows, animals and magic beings, and heroes and villains. They can be scary, funny, or exciting. Different types of folktales may entertain or teach a lesson. They may also try to explain things that people do not understand. Myths are similar to folktales. They are traditional stories about a culture's beliefs about life.

Different cultures tell different stories. However, some similar themes appear in folktales told in many different places and cultures. For example, folktales about clever “tricksters” are common in western Africa, the Americas, and other places. Trickster tales usually involve a weaker animal using its wits to get the better of a stronger one.

Stories of heroes are also common in many cultures. Heroic tales help bind a people together and help them remember their history. For example, King Arthur and the Knights of the Round Table are the heroes of many French and English legends.

Fables

A fable is a type of folktale that teaches a lesson. Fables are usually entertaining tales featuring animals that talk and



Anansi the spider is a trickster character that appears in many western African folktales. In one story he lures a swarm of hornets into a gourd, where he will trap them.

behave as people do. Because they have humanlike qualities, the animals show how foolish or wise people can be. For

example, “The Three Little Pigs” teaches that hard work is important: The house built by the hardest-working pig is the only one that survives the wolf’s attacks.

Some of the oldest fables came from India and Greece thousands of years ago. Many fables that are familiar in English today are said to have been written in ancient Greece by a man named Aesop.

Fairy Tales



In the story of “Little Red Riding Hood” a wolf tries to trick a young girl by dressing up as the girl’s grandmother.

Fairy tales are a kind of folk story about magical events and creatures. They often tell about a young person meeting fantastic beings such as fairies, witches, giants, or dragons. Stories such as “Cinderella,” “Little Red Riding Hood,” and “Sleeping Beauty” began as spoken folktales with no one author. Two German brothers called the Brothers Grimm collected and wrote down many fairy

tales in the 1800s. Some modern writers, such as Hans Christian Andersen, invented their own fairy tales.

► More to explore

Aesop • Andersen, Hans Christian
• Arthurian Legend • Grimm Brothers
• Mythology • Storytelling

Food and Nutrition

Plants make their own food with the sun’s help. Animals, including humans, do not. Instead they eat food—plants or other animals—to get what their bodies need to live and grow. Nutrition is the science of how the body uses food.

Calories

Food gives the body the energy it needs for everything it does, from repairing damaged cells to sleeping. The amount of energy a food can produce is measured in calories.

Nutrients

Food also provides the nutrients that the body needs to function and maintain itself. These nutrients are proteins, carbohydrates, fats and oils, minerals, vitamins, and water.

Proteins are needed for body tissue to grow and repair itself. Carbohydrates give the body most of the energy it needs. Starches and sugars are carbohydrates.

Did You Know?

If a person takes in more food than the body needs, the extra calories are changed into fat—a stored form of energy.

The body uses fats to maintain its temperature and to cushion organs. Fats also help the body use certain vitamins. But fats can also be harmful. For example, some kinds of fats can raise the level of cholesterol in the blood. Cholesterol is an important substance in the body. However, when the body has too much cholesterol, the extra begins to build up in the walls of the blood vessels. This gradually narrows the blood vessels so that blood cannot flow freely through them. This may lead to a heart attack or stroke.

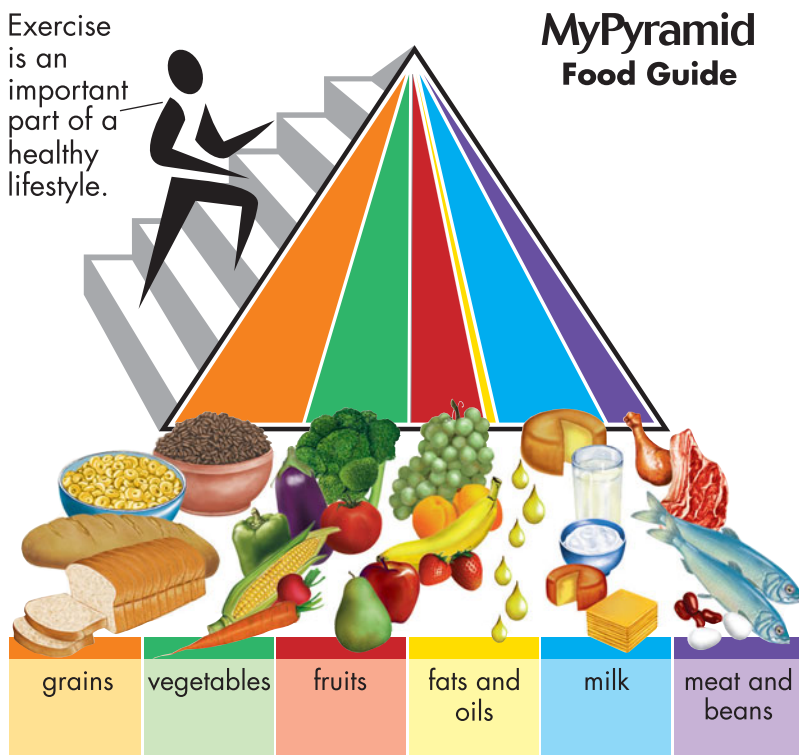
Minerals serve a variety of purposes. Calcium, for example, builds bones and teeth and helps to clot blood. Iron is needed to build red blood cells and

carry oxygen from the lungs to other body cells. Other minerals important to the human body include iodine, magnesium, sodium, potassium, and zinc.

The body also needs vitamins. Vitamin C keeps gums healthy and helps the body absorb iron. Vitamin D works with calcium and phosphorus to make strong bones and teeth. Other vitamins are A, E, K, and the B-complex vitamins.

Water is important in many chemical reactions in the body. In fact, every cell in the body must be bathed in water. Water also helps the body get rid of wastes and maintain its temperature. Water makes up about 60 percent of an adult's body weight.

Exercise is an important part of a healthy lifestyle.



Source: U.S. Department of Agriculture

People should try to eat several servings of grains, vegetables, fruits, dairy products, and meat or beans every day. They should eat only a small amount of fats and oils.

Food Pyramid

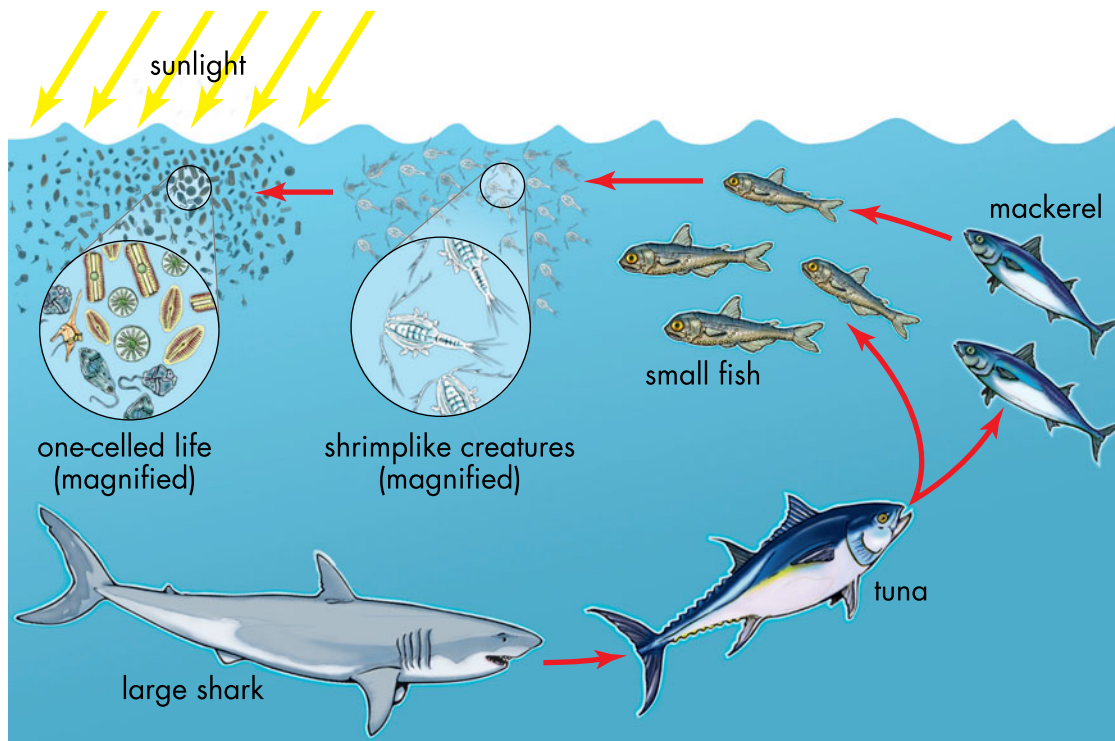
Different foods contain different nutrients. Some foods are better sources of nutrients than others are. Scientists have created a chart called the food pyramid to show how much of different groups of food a person should eat in order to be healthy. In general they recommend that people eat more grains, vegetables, fruits, and milk and fewer fats and oils.

► More to explore

Cholesterol

Food Chain

The term food chain describes the order in which organisms, or living things, depend on each other for food. Every



A food chain in the ocean begins with tiny one-celled organisms called diatoms. They make their own food from sunlight. Shrimplike creatures eat the diatoms. Small fish then eat the shrimplike creatures, and bigger fish eat the small fish.

ecosystem, or community of living things, has a food chain. Some have more than one food chain.

Most food chains start with organisms that make their own food, such as plants. Scientists call them producers. Organisms that eat other living things are known as consumers. A squirrel that feeds on plants is called a primary consumer. A hawk that eats the squirrel and other primary consumers is called a secondary consumer.

Decomposers are often the final link in a food chain. Decomposers are bacteria and other organisms that cause decay. When plants and animals die, decomposers break down their tissues. This adds nutrients to the soil so that new

plants may grow. Then the food chain begins again.

A food web is a group of food chains within an ecosystem. Most living things eat more than one type of animal or plant. So their food chains overlap and connect. For example, the hawk that ate the squirrel also may eat fish. This makes the hawk a part of two food chains, or a food web.

► More to explore

Ecosystem • Living Thing

Food Poisoning

Food sometimes gets contaminated or infected with harmful things. A person who eats such food can get an illness

called food poisoning. Food poisoning is usually not serious, but some types are deadly.

Symptoms

The symptoms of food poisoning usually begin within hours of eating the contaminated food. The most common symptoms are fever, stomach cramps, nausea, vomiting, and diarrhea.

Causes

Certain microorganisms (tiny living things) cause most types of food poisoning. Bacteria and other microorganisms can infect eggs, meat, vegetables, and many other foods. After entering the body these microorganisms release poisons that make people sick.

Some chemicals can also cause food poisoning. These chemicals are often added to food while it is being grown, processed, or prepared. For example, many farmers spray chemicals on crops to kill weeds and insects. Some people may

have a bad reaction to those chemicals when they eat the crops.

Some plants and animals contain natural poisons that are harmful to people.

These include certain kinds of seafood, grains, nuts, seeds, beans, and fungi (mushrooms). Molds called mycotoxins may also cause food poisoning.

Prevention

When people handle food properly, the risk of food poisoning is very small. Microorganisms multiply rapidly in dirty places and in warm temperatures. This means that people should never touch food with dirty hands or put food on unwashed surfaces. Food should be refrigerated to stop microorganisms from growing. Meat needs to be cooked thoroughly to kill any dangerous microorganisms.

People should also wash food covered with chemicals before eating it. Finally, people should not eat wild mushrooms or other foods that grow in the wild. Some of these foods may contain natural substances that are poisonous to humans. In addition, some types of fish, such as the moray eel, and certain shellfish can be poisonous.

Treatment

Most people recover from food poisoning after a few days of resting and drinking extra fluids. People who cannot drink enough may need to have fluids pumped into their veins. If people eat natural poisons, they must go to the



Salmonella bacteria that cause illness are seen through a microscope.

hospital right away to have their stomachs emptied.

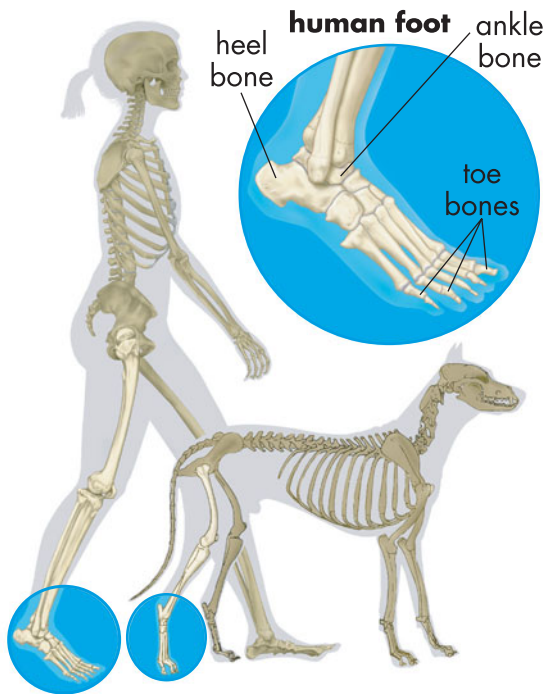
► More to explore

Bacteria • Food and Nutrition

Foot

All animals with a backbone and legs have a foot attached to the end of each leg. Feet are made up of bones, muscles, and connective tissue. At the front, feet are divided into digits, or toes. Hardened skin—in the form of claws, nails, or hooves—covers the ends of the digits.

While an animal is standing, its feet touch the ground and support its weight. The structure of feet also allows animals to walk, run, and jump.



Humans place their whole foot on the ground while walking. Dogs keep their heels off the ground.

The Human Foot

The human foot has a heel, a middle portion called an instep, and toes. The bottom of the foot is called the sole. The ball of the foot is the part of the sole behind the toes.

Each foot has 26 bones. The bones form two arches that allow humans to stand and walk upright. One arch extends from heel to toes. It absorbs the shock of walking. The other arch reaches across the ball of the foot. It helps to spread the weight of the body over the foot. The joints, or places where the bones meet, let the foot bend easily.

Feet of Other Animals

Some animals—including raccoons, monkeys, and apes—can use their feet to grasp things. But like other animals, they also use their feet to get around.

While walking, some animals, such as bears and baboons, put the whole foot on the ground. Others, including cats and dogs, never put their heels down. Still other animals, such as horses and deer, walk on their hooves, which are at the tip of one or two toes. Running on tiptoe allows these animals to move very quickly.

Mollusks, including snails and clams, have a muscle called a foot that allows them to move. What are called feet in insects are just the lower parts of their legs.

► More to explore

Hoof • Leg • Nail and Claw

Did You Know?

A podiatrist is a doctor who specializes in the care of human feet.

Football



A football player carries the ball while a player for the other team tries to stop him.

Millions of people in the United States consider autumn to be football season. Football is a very popular sport that is played on high school fields, college campuses, and in professional stadiums.

Football involves running, passing, kicking, and body contact. A football game is played between two teams of 11 players each. A team scores points by moving a ball across the other team's goal line. The team that scores more points wins.

This game is sometimes called American football. It is played mainly in the United States. Canadian football is very similar to the U.S. game. But in most countries around the world the word football refers to the sport also known as soccer.

Playing Field and Equipment

American football is played on a grassy, rectangular field. The field is 120 yards (110 meters) long and 160 feet (49 meters) wide. White lines called end lines and sidelines mark the edges of the field.

Each end of the field has a goal line. The goal lines are 100 yards (91 meters) apart. The 10-yard areas between the goal lines and the end lines are called the end zones. A pair of goalposts connected by a crossbar stands at the back of each end zone.

Most of the action in a football game takes place between the goal lines. White lines run across this part of the field every 5 yards (4.6 meters). These lines help to show how far a team has moved the football. Two sets of short lines, called hash marks, cross these lines. Officials use the hash marks to place the ball on the field after play is stopped.

Because football is a rough game, players wear equipment to protect themselves. They wear padding on their shoulders, hips, thighs, and knees. They also wear a mouth guard and a helmet with a face mask.

A football is an oval with pointed ends. It is filled with air and usually covered with leather.

Playing the Game

A football game begins with a kickoff. One team, called the kicking team, kicks the football to the other team, called the receiving team. A player on the receiving

team catches the ball. The player then runs toward the kicking team's goal line. The kicking team tries to stop him. Its players can tackle, or throw down, the ballcarrier. They can also push him out of the playing area. This is called being out of bounds.

The game continues from the spot where the ballcarrier was stopped. An official places the ball on the field. The teams line up facing each other on opposite sides of the ball. An imaginary line called the line of scrimmage runs through the football to each sideline. It separates the two teams.

A football team has some players who play offense and others who play defense. The two teams take turns playing offense and defense.

The team with the ball plays offense. It tries to move the ball down the field for a score. The offense can move the ball either by running with it or by throwing, or passing, it. The different types of running or throwing tactics that the offense uses are called plays. The offense designs plays to move forward by overpowering or fooling the defense. The

offensive player called the quarterback begins most plays. The quarterback usually hands or passes the ball to a teammate.

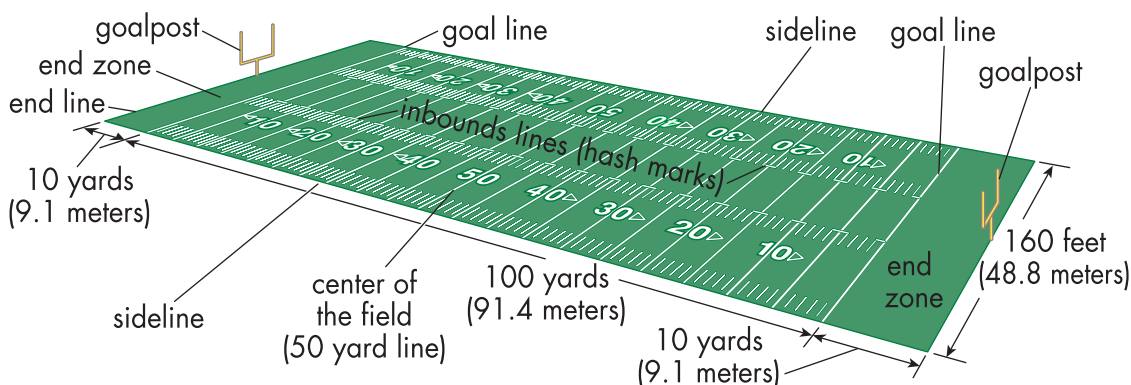
The defense tries to prevent the other team from scoring. Defensive players can tackle the quarterback or any other player who has the ball. They can also catch a pass that the quarterback meant to throw to a teammate. This is called an interception. The team that makes the interception then switches to offense.

The offense has four tries, called downs, to move the ball at least 10 yards. If the offense fails to do this, the other team gets the ball. If the offense does move the ball 10 yards or more, it gets another four downs. This continues until the offense scores, the defense takes away the ball, or time runs out.

The offense can score touchdowns or field goals. Running or passing the ball across the goal line scores a touchdown. A touchdown is worth six points. After a touchdown the scoring team has a chance to earn extra points. Kicking the ball between the goalposts is worth one point. Getting the ball into the end zone

Did You Know?

American football is also called gridiron football.



An American professional football field is almost the same as a college football field.

Did You Know?

Touch football and flag football are versions of football that are often played in U.S. elementary schools. They are not as rough as tackle football.

by running or passing earns two points. When the offense does not score a touchdown, it can score three points by kicking the ball between the goalposts. This is a field goal.

Sometimes the defense scores, too. If an offensive player drops the ball, a defensive player can pick it up and carry it for a touchdown. Also, a defensive player can run with the ball after intercepting a pass. The defense scores two points by trapping the offense in its own end zone. This is called a safety.

History

Football started in the late 1800s in the United States as a college sport. Princeton and Rutgers played the first college football game in 1869. This game was similar to soccer. In 1871 students at Harvard University invented their own game. It combined soccer and the English game called rugby. In 1876 representatives from Harvard, Princeton, Yale, and Columbia universities wrote a set of football rules based on rugby.

Walter Camp, a coach at Yale, helped to separate the game of American football from rugby. Camp introduced the 11-man team and the line of scrimmage. He also began the system of downs.

The first professional football game was played in 1895. In 1920 professional football teams formed the organization that would later be called the National Football League (NFL). In 1970 the rival American Football League became part of the NFL. Since 1967 the two best teams at the end of each season

have competed for the Super Bowl championship. This game is one of the most watched shows on television.

► More to explore

Rugby • Soccer

Force

A force is a push or a pull on an object. A force happens when two objects interact—that is, when one object does something to the other object. When the interaction stops, the force stops, too.

Contact Forces and Field Forces

There are two types of forces: contact forces and field forces. Contact forces happen when objects touch each other. For example, contact forces happen when a person kicks a ball or pulls a wagon. Other examples of contact forces are sandpaper rubbing on a piece of wood and wind blowing against a moving car.



Each side in a tug-of-war game uses force to try to pull down the other side.

Field forces happen when two objects interact without touching each other. Field forces can create a push or a pull even at a distance. Gravity is a field force. When an apple falls from a tree, the force of gravity pulls the apple toward the ground. Another field force is magnetism. Paper clips stick to a magnet because its magnetic force is pulling on the paper clips.

Measuring Force

Most scientists measure force using a unit called the newton. Newtons measure the force needed to accelerate, or speed up, objects. Force may also be measured in pounds.

Forces and the Laws of Motion

In the late 1600s, the English scientist Isaac Newton came up with three laws that deal with forces and motion. The first law says that the motion of an object will not change unless a force pushes or pulls it. The second law says that a force on an object will make the

object speed up in the same direction as the force. Also, a strong force will make the object speed up faster than a weak force on the same object. The third law says that whenever a force pushes on an object, the object pushes back with an equal and opposite force.

► More to explore

Gravity • Magnet and Magnetism
• Motion

Ford, Gerald R.

Gerald Ford was the 38th president of the United States. He was not elected to office. President Richard M. Nixon appointed him vice president in 1973. Ford became president in 1974 after Nixon resigned over the scandal known as Watergate.

Early Life and Career

Originally named Leslie Lynch King, Jr., Gerald Ford was born on July 14, 1913, in Omaha, Nebraska. His parents



TIMELINE

Ford is born in Omaha, Nebraska.

July 14, 1913

Ford is elected to the U.S. House of Representatives.

1948

President Richard Nixon appoints Ford as his new vice president after Agnew resigns.

1973

August 8, 1974

Nixon resigns and Ford becomes president.

Ford pardons Nixon.

September 1974

Ford loses the presidential election to Jimmy Carter.

1976

Ford dies in California.

December 26, 2006



Gerald R. Ford

divorced soon after his birth. His mother, Dorothy Gardner King, moved to Grand Rapids, Michigan, and married Gerald Rudolph Ford. The elder Ford adopted the boy and gave him his name. The younger Ford attended the University of Michigan, where he was a star football player. In 1941 he earned a law degree from Yale University.

Ford joined the U.S. Navy in 1942 and served in World War II. After the war he returned to practicing law. In 1948 Ford married Elizabeth Anne Bloomer. They had four children.

Congress and Vice Presidency

A Republican, Ford was elected to the U.S. Congress in 1948. He served in the House of Representatives for 25 years. In 1973 Vice President Spiro T. Agnew resigned after being charged with not paying taxes and other crimes. President

Nixon named the popular and honest Ford as Agnew's replacement.

Presidency

After Nixon resigned in 1974, Ford was sworn in as president. Ford granted Nixon a full pardon for any crimes that he might have committed as president. The pardon angered many people. Many also opposed Ford's pardons of men who had avoided military service during the Vietnam War.

Ford tried to stop rising prices and unemployment, but he could do little to help the poor economy. Twice in September 1975 people tried to assassinate him. Secret Service agents stopped one shooter; the other shooter missed.

Defeat and Retirement

By the 1976 election many voters viewed Ford as a weak president. He lost to Democrat Jimmy Carter. In 1980 Ronald Reagan asked Ford to run as his vice president, but Ford chose to retire to private life. Ford died on December 26, 2006, in Rancho Mirage, California.

► More to explore

Carter, Jimmy • Nixon, Richard M.
• United States • Vietnam War

Forest

A large area filled with many trees is called a forest. Forests grow in almost every part of the world. The only places bare of forests are deserts, some prairies



Forests are home to many plants besides trees.

and mountaintops, and the North and South poles.

Types of Forest

Two basic types of tree make up most forests: hardwoods and softwoods. Many forests contain either hardwoods or softwoods, but some forests have both types.

Maples and oaks are examples of hardwood trees. Hardwoods have wide leaves and grow fruits. They are often deciduous, meaning they drop their leaves every fall. However, some hardwoods, such as mahogany trees, keep their leaves all year. Hardwood forests grow in places with temperate (mild) or tropical (hot) weather.

Pines and redwoods are examples of softwood trees. Softwoods have cones and needles rather than fruits and wide leaves. Softwoods do not lose their needles each year. Many softwoods are known as evergreens because their needles remain green year-round. Soft-

wood forests often grow near mountains and in cool regions.

Thick forests that grow in wet parts of the world are called rain forests. Rain forests may contain hardwoods, softwoods, or both.

Life in the Forest

Every forest is a complex living system made up of thickly growing trees, bushes, vines, fungi, and other plants. Forests are also the homes of mammals, birds, insects, and many other animals. These living things all depend on each other to survive.

As a forest ages or changes, it affects all the living things in it. Diseases or insect attacks may weaken its trees and plants. Fire can destroy the food and shelter that animals need to survive. Humans can also endanger forest plants and animals by chopping down too many trees. After a forest changes, it may have a new set of plants and animals.

Forest Products

Many important natural resources come from the world's forests. Forests provide food, wood, fuel, natural fibers, and other materials. These resources may be made into furniture, shelter, paper, clothing, medicines, and many other products.

To save natural forests people sometimes plant tree farms. As workers cut down the trees grown on these farms, they plant new trees to replace them.

Did You Know?

Tropical rain forests may have trees that are more than 150 feet (45 meters) tall.



A woman walks through a tropical forest in Seychelles, an island country in the Indian Ocean. Hiking is a popular activity in many forests.

Other Benefits of Forests

Forests are known as the lungs of the planet. This is because they supply a huge amount of Earth's oxygen, which animals need to breathe. The trees of a forest give off oxygen as part of a process called photosynthesis. Forest trees also help to protect soil from erosion. They block the forces of wind and water that wear away the land. In addition, forests offer a peaceful place for hiking, camping, bird-watching, and exploring nature.

Protecting Forests

For thousands of years people have been cutting down forests for wood and to make room for farms and cities. Now many of the world's forests are in danger of disappearing. Many people work to protect forests.

Forestry is the science of managing forests. People who work in forestry study the life cycles of trees and other forest plants. Foresters usually have a college degree in forest sciences. They work to prevent the spread of tree diseases, keep trees safe from harmful insects, and control forest fires. Many professional foresters work for the government.

To save forests many governments also create national forests, state parks, and wilderness preserves. In these places forests are left in their natural state for people to enjoy. Sequoia National Park in California was created in 1890 to protect groves of giant sequoia trees.

► More to explore

Erosion • National Parks
• Photosynthesis • Rain Forest • Tree

Fossil

Fossils are the remains or traces of plants and animals that lived long ago. Fossils give scientists clues about the past. For this reason, fossils are important to paleontology, or the study of prehistoric life.

Most fossils are found in earth that once lay underwater. They usually formed from the hard parts—such as shells or bones—of living things. After a living thing died, it sank to the bottom of the sea. Layers of earth and the remains of other living things built up on top of it. Over time, these layers turned into rock. Eventually, part or all of the living thing's hard parts also turned into rock. The fossil is the shape of these hard parts in the rock.

Other fossils are imprints on soft material that later hardened into rock. For example, scientists have found dinosaur footprints in rock that formed from mud. Many plants left leaf prints, too.

Another kind of fossil can form after a small insect or a piece of a plant gets trapped in resin. (Resin is a sticky substance made by pine and fir trees.) When the resin hardens into a rocklike material called amber, the object inside is preserved.

► More to explore

Amber • Paleontology • Prehistoric Life
• Rock

Fossil Fuel

All the machines of modern life require energy to make them run. About 90 percent of that energy comes from burning fossil fuels. Fossil fuels include petroleum (oil), coal, and natural gas. These materials are called fossil fuels because, like fossils, they are the remains of organisms that lived long ago. Organisms are plants, animals, and other living things.

How Fossil Fuels Formed

Fossil fuels formed in the ground hundreds of millions of years ago. Dead organisms sank into mud and rock. Over time many layers of rock built up. The remains of the organisms slowly changed in form to become different kinds of fossil fuels. Coal came from plants. Petroleum and natural gas came mainly from microscopic organisms such as algae.

Uses and Producers

Fossil fuels and their products have many uses. Power plants use fossil fuels to produce electricity. People heat their

Did You Know?

Fossil fuels contain an element (basic substance) called carbon. The burning of fossil fuels sends carbon into the air in the form of a gas called carbon dioxide.



A rock contains the fossilized skeleton of a mammal-like reptile. This animal lived more than 200 million years ago.



Coal is an important type of fossil fuel. It is buried underground and must be dug up.

homes and other buildings by burning fossil fuels. Gasoline, a product made from petroleum, fuels cars and other kinds of motorized equipment.

Many countries produce fossil fuels. The greatest producer of petroleum is Saudi Arabia. Russia has the largest reserves of natural gas. Major coal-producing countries include the United States and China. The United States uses more fossil fuels than any other country.

Disadvantages of Fossil Fuels

Since the late 1700s people have been using fossil fuels at a faster rate than ever before. But the planet's supply of fossil fuels is limited. Fossil fuels are called nonrenewable resources. Once they are used up, they will be gone forever.

The use of fossil fuels harms the environment as well. When petroleum and coal burn, they release harmful gases. These gases react with moisture to create acid rain, a dangerous form of pollution. Burning fossil fuels also increases the

temperature of Earth's atmosphere. This warming, called the greenhouse effect, may be harmful to living things.

For these reasons scientists and engineers have developed new ways to generate power without using fossil fuels. For example, some cars are now powered by electricity instead of gasoline. Homes can be heated by sunlight. Some electric power plants run on nuclear energy, water power, or wind power.

► More to explore

Coal • Energy • Fossil • Gas, Natural • Petroleum • Pollution

Fourth of July

► see Independence Day.

Fox

The Fox were a Native American tribe that traditionally lived in the western Great Lakes region. By the 1600s they had settled in what is now northeastern Wisconsin. Europeans called them the Fox, but they called themselves



Five Fox men pose in about 1890.

Mesquakie, meaning “Red-Earth People.”

During the spring and summer the Fox lived along river valleys in large houses made from poles and elm bark. They grew corn, beans, squash, and pumpkins and gathered wild nuts and berries for food. After the harvest the Fox left their villages to hunt bison (buffalo) on the prairies. They also hunted deer and other game. While on the hunt they lived in small, portable dome-shaped houses called wigwams.

During the 1600s traders from France and England began arriving in Fox territory. The French, with the help of the Ojibwa tribe, drove the Fox into what are now Illinois and Iowa. The United States later forced the Fox to give up their land. In the mid-1800s the tribe moved to what is now Oklahoma, where they shared a reservation with the Sauk. Americans called both groups the Sauk and Fox tribe. In 1857 some Sauk and Fox returned to Iowa, where they bought land. At the end of the 20th century there were more than 4,000 Sauk and Fox. Most lived in Kansas, Nebraska, Oklahoma, and Iowa.

► More to explore

Native Americans

Fox

Foxes are mammals that look like small, bushy-tailed dogs. They live all over the world. Different kinds favor different habitats. The red fox likes farmland. The gray fox lives in forests. The silver fox is



Long fur keeps a red fox warm in winter.

found in cold areas. The Arctic fox lives around the North Pole.

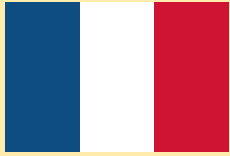
Foxes have pointed ears, short legs, and a narrow snout. They are about 32 to 57 inches (81 to 145 centimeters) long, including the tail. Foxes usually weigh 6 to 17 pounds (3 to 8 kilograms). They have long fur that varies in color. Red foxes are reddish brown. Silver foxes are black with gray-tipped hair. The Arctic fox is brownish in the summer and white in the winter.

Foxes usually live in dens. The den is often a burrow that another animal dug and left. Most foxes hide by day and hunt by night. Foxes will eat almost anything they can find. They like to eat birds, including chickens, and small mammals such as gophers and rabbits.

Foxes have few enemies except for humans. People hunt foxes for sport and for their fur. People also raise foxes on farms for their fur.

► More to explore

Dog • Mammal



France

France is a large country in western Europe. France is known for its proud history and rich culture. The capital is Paris.

Geography

France shares borders with Belgium, Luxembourg, Germany, Switzerland, Italy, Spain, and Andorra. The Mediterranean Sea lies to the south, and the Atlantic Ocean lies to the west.

In the north and west the Seine and Loire rivers run through broad plains. In the southeast are the French Alps. France's highest point—Mont Blanc, which rises 15,771 feet (4,807 meters)—is in the Alps. In the southwest the Pyrenees Mountains lie between France and Spain.

The north of France has cool to cold winters, warm summers, and moderate rainfall. On the Mediterranean coast



Dinan is a town on the Rance River in the region of Brittany in western France.

winters are sunny, and it rarely rains in summer.

Plants and Animals

Forests cover about one fourth of the land. Pine, fir, ash, oak, beech, maple, chestnut, and olive trees are common. The country's wild animals and birds include foxes, beavers, wildcats, deer, wild pigs, hawks, and storks.

People

Most of the people are French. The French language is one of the world's most widely spoken languages. The population also includes small groups of North Africans and other Europeans. Some Basque people live in southern France. More than three fourths of the people are Roman Catholics. Other religious groups include Muslims, Protestants, and Jews.



Economy

France is one of the major economic powers of the world. Its economy is based on services, including tourism and banking. Manufacturing is also important. France produces machinery, cars, aircraft, medicines, food products, iron and steel, cosmetics, clothing, and other goods.

Though agriculture is a small part of the economy, France is a top producer of wheat, cattle, pigs, and chickens. It is also well known for its cheeses and wines.

History

People lived in what is now France more than 100,000 years ago. The Gauls, a Celtic people, migrated to the area in about 1200 BC. By about 50 BC the ancient Romans had conquered the region, which they called Gaul.

As the Roman Empire weakened, German tribes invaded Gaul. The Franks

were the strongest of those tribes, and they gave France its name. The greatest Frankish ruler was Charlemagne, who came to power in AD 768. By the early 800s Charlemagne's empire covered most of western Europe. When Charlemagne died, however, his empire was divided into three parts. After 843 the western section became known as the kingdom of France.

Wars over Land and Religion

In 1066 the French duke of Normandy conquered England. Because of that connection to France, English kings later claimed parts of France for themselves. This led to many battles between the two countries.

One particularly difficult period was the Hundred Years' War, which began in 1337. France was close to defeat when a peasant girl named Joan of Arc led the French army to victory. By the end of the war in 1453, the English had lost nearly all of their land in France.



TIMELINE

Ancient Rome conquers Gaul.		The Hundred Years' War with England begins.		Emperor Napoleon I is defeated.		France joins the European Union.
about 50 BC	AD 768	1337	1789	1815	1940	1993
Charlemagne becomes king of the Franks.		The French Revolution begins.		Germany invades France during World War II.		

During the 1500s Protestantism spread across Roman Catholic France. Wars broke out between Protestants (known as Huguenots) and Roman Catholics. Peace came in 1598 when King Henry IV signed the Edict of Nantes, which granted Protestants some rights.

French Revolution and Napoleon

During the 1600s France became the greatest power in Europe. Louis XIV, who reigned from 1643 to 1715, raised the power of the king to new heights. In the 1700s, however, France lost a series of costly foreign wars. At home, political disorder and public anger resulted in the French Revolution in 1789. This uprising by the French people led to the end of the French monarchy. After the revolution France became a republic.

Facts About FRANCE



Population
(2008 estimate)
62,028,000

Area
210,026 sq mi
(543,965 sq km)

Capital
Paris

Form of government
Republic

Major cities
Paris, Marseille,
Lyon, Toulouse,
Nice

After a period of weak government France fell into the hands of General Napoleon Bonaparte in 1799. He named himself emperor of France in 1804. Napoleon set out to conquer Europe. He was finally defeated in 1815. Afterward the monarchy was restored, but it fell in 1870. France once again became a republic.

World Wars

Germany invaded France in 1914, at the beginning of World War I. France and its allies narrowly defeated Germany during that war. Less than 30 years later, however, Germany again invaded France, during World War II. While occupied by Germany, France was led by a French government that worked with the Germans. But part of the French



A glass pyramid is a modern addition to the Louvre, an art museum in Paris, France.

army, called the Free French, escaped to England under General Charles de Gaulle. Free French, U.S., and British forces drove the Germans out of France in 1944.

Postwar France

In the 1950s and 1960s France lost its colonies in Vietnam and Algeria after fighting costly wars in those regions. Nevertheless, France's political and economic power grew. In 1993 France became one of the original members of the European Union.

► More to explore

Alps, The • De Gaulle, Charles • European Union • Frank • French Revolution • Huguenots • Joan of Arc • Napoleon • Paris • Pyrenees • World War I • World War II

Frank

The Franks were a group of people who lived in Europe more than a thousand years ago. The country of France was named after them. The Franks moved to the land that became France from a region that is now in Germany. They spoke a language that is related to German.

In ancient times the Romans ruled what is now France as part of the Roman Empire. The land was then called Gaul. The Roman Empire lost power in the AD 400s. Franks and other Germanic peoples moved into Gaul during this time.

King Clovis I was the first important Frankish king. He brought several groups of Franks together under his leadership. In the late 400s Clovis started to follow the religion of Christianity. His followers became Christians,

too, which helped to unite them as a people. By the early 500s Clovis ruled most of Gaul.

A later king named Charles became known as Charlemagne, which means Charles the Great. Charlemagne added to the lands ruled by the Franks. Charlemagne also spread Christianity. In 800 the pope (leader of the Christians in Rome) rewarded Charlemagne by giving him the title of emperor. Charlemagne's empire became known as the Holy Roman Empire.

Charlemagne's sons and grandsons were unable to hold the Frankish empire together after Charlemagne died. The Frankish lands in the east continued as the Holy Roman Empire. The Frankish lands in the west became France.

► More to explore

Charlemagne • France • Holy Roman Empire • Rome, Ancient



A stone carving from the 600s shows a Frankish warrior.

Frank, Anne

During World War II a young Jewish girl, Anne Frank, kept a diary for two years while hiding from the Nazis with her family. Anne and her family were victims of the Holocaust, which was Nazi Germany's campaign to destroy the Jews. From the diary, readers have found out what Jewish people experienced and felt during the time of the Holocaust.

Early Life

Anne Marie Frank was born on June 12, 1929, in Frankfurt, Germany. In 1933 Adolf Hitler's Nazi Party came to power,

Did You Know?

Anne Frank's diary shows remarkable hope in the face of fear and evil. She wrote, "In spite of everything I still believe that people are really good at heart."



Anne Frank

and Germany became a dangerous place for Jews. Anne's family soon moved to Amsterdam, The Netherlands.

In May 1940, during the early months of World War II, Germany took over The Netherlands. By 1942, Jews were being rounded up and sent to camps where most of them would die.

The Secret Annex

Anne's father prepared some rooms upstairs from his business offices. This was to be a "secret annex" where his family could hide. On July 6, 1942, the Frank family and four other people went into hiding. Some non-Jewish friends supplied them with food.

For two years the eight people shared the small space. They were always afraid, but they tried to live normally. Anne wrote in her diary about her daily life and her hopes.

After the Annex

Somehow the Gestapo (German secret police) found out about the annex. On August 4, 1944, they arrested everyone. Anne and her sister went to the Bergen-Belsen camp in Germany. In March 1945 they both died of a disease called typhus. Except for her father, everyone from the secret annex died in the camps.

After the raid, friends discovered Anne's diary. In 1947 Mr. Frank had it published. The English translation was titled *The Diary of a Young Girl*. The annex building in Amsterdam is now a museum called the Anne Frank House.

► More to explore

Holocaust

Frankfort



Population
(2000 census)
27,741

Frankfort is the capital of the U.S. state of Kentucky. The Kentucky River flows through the city.

Frankfort is a trade center for the area. Its farms produce tobacco and corn. Some farmers in Frankfort raise Thoroughbreds, a breed of horse used in horse racing. Factories in the city make bourbon whiskey, candy, furniture, and electronics.



The Kentucky Capitol in Frankfort is 210 feet (64 meters) high.

A U.S. general founded Frankfort in 1786. The city became the capital of Kentucky in 1792. The Capitol burned down twice in the 1800s. Both times the cities of Louisville and Lexington tried to take over as state capital. But Frankfort remained the capital of Kentucky. In 1937 floods greatly damaged the city.

► More to explore

Kentucky

Franklin, Benjamin

Benjamin Franklin won fame as a writer, a publisher, a scientist, and an inventor. He is best remembered, however, for his leadership in the American colonies and the early United States.

Printer and Inventor

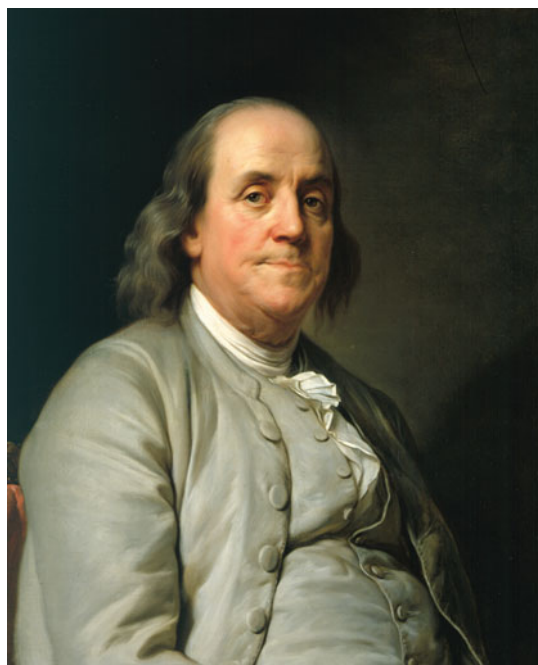
Franklin was born in Boston, Massachusetts, on January 17, 1706. He left

school at age 10. At age 12 he went to work in his brother's printing shop.

In 1723 Franklin moved to Philadelphia, Pennsylvania. He worked there as a printer. His most popular publication was *Poor Richard's Almanack*. The almanac featured Franklin's witty sayings and verses. A famous one was "Early to bed and early to rise, makes a man healthy, wealthy, and wise."

Franklin started many public services in Philadelphia. They included a fire department, a hospital, an insurance company, and a library. A school he founded became the University of Pennsylvania.

Franklin was a great scientific thinker and inventor. He invented the Franklin stove, which was used to heat rooms, and a type of eyeglasses called bifocals. His experiments with electricity led to the invention of the lightning rod. That



Benjamin Franklin

metal rod is used to protect buildings from lightning.

Politician

Franklin became a respected political leader in the years leading up to the American Revolution. In 1765 the British Parliament passed the Stamp Act, a tax on printing in the colonies. The act angered the colonists. Franklin persuaded the British to withdraw it.

In 1775, as war with Great Britain grew closer, Franklin took part in the Second Continental Congress. There he helped write the Declaration of Independence. In 1776 he went to France to seek aid for the Revolution. In 1787 he signed the U.S. Constitution.

In his last years Franklin wrote his autobiography. He also worked to end slavery. He died in Philadelphia on April 17, 1790.

► More to explore

American Revolution • Continental Congress • United States Constitution

Frederick the Great

Frederick II ruled Prussia, a kingdom in what is now Germany, from 1740 to 1786. He was a great military leader who made Prussia a major power in Europe. Because of his military genius, he earned the title Frederick the Great.

Frederick was born on January 24, 1712, in the city of Berlin. His father



Frederick the Great

was Frederick William I, king of Prussia. Frederick's early life was unhappy. He liked music, art, and literature, but his father wanted him to become a soldier. The king criticized and beat him. At age 18 Frederick ran away, but he was caught. His father put him in prison as punishment.

Frederick became king of Prussia when his father died in 1740. As king he was called Frederick II. He spent the first half of his reign waging war. He took land from Austria and conquered other German lands. Later he added a large part of Poland to Prussia's territory.

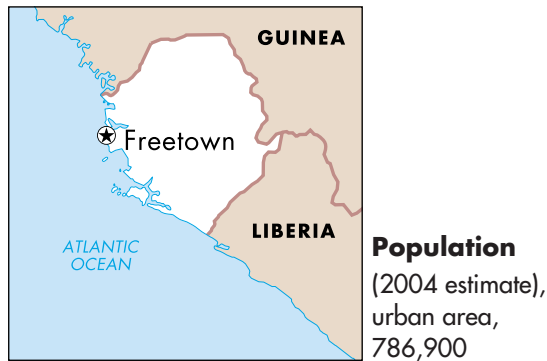
Building a great army was always Frederick's most important goal. He used most of the kingdom's money to feed, equip, and pay his soldiers. But Frederick also encouraged industry, education, and culture. He wrote poetry and books on history and politics. He also composed

music. Frederick died near Berlin on August 17, 1786.

► More to explore

Prussia

Freetown



Freetown is the capital of the West African country of Sierra Leone. The city lies on the coast of the Atlantic Ocean. It is Sierra Leone's main port and largest city.

The city is named Freetown because it began as a home for freed slaves. An Englishman named Granville Sharp founded Freetown in 1787. Sharp was an abolitionist, or a person who worked to end slavery. Africans who had been slaves in England began settling the new town. Freed and escaped African slaves from other parts of the world also moved there.

In the early 1800s Sierra Leone became a British colony. In the middle of the 1800s Freetown was the capital of all of Great Britain's colonies in West Africa. Sierra Leone became an independent country in 1961. Freetown became its capital.

Rebels fought the government of Sierra Leone from 1991 to 2002. Freetown was often the site of terrible violence.

► More to explore

Abolitionist Movement • Sierra Leone
• Slavery

Frémont, John Charles

John Charles Frémont was a U.S. explorer, soldier, and politician. He blazed many trails in the American West. He also played a key role in the early history of California.

Frémont was born on January 21, 1813, in Savannah, Georgia. He attended college in South Carolina. Then he became a surveyor. In that job he measured land in the wilderness.

In 1838 Frémont helped to survey the upper Mississippi and Missouri rivers. While in Missouri Frémont met Senator Thomas Hart Benton. With Benton's support, Frémont led expeditions to



John Charles Frémont

map much of the area between the Mississippi River valley and the Pacific Ocean. He explored the Oregon Trail in 1842. In 1843 he reached California.

In 1845 Frémont returned to California. California was then part of Mexico. American settlers were rebelling against Mexican rule. The United States went to war with Mexico around the same time. Frémont joined the Army and helped the Americans take control of California. Then he was governor for a time.

After California became a state in 1850, Frémont was elected one of its first senators. Later, from 1878 to 1883, Frémont was governor of Arizona Territory. He died on July 13, 1890.

► **More to explore**
California • Oregon Trail

French and Indian War

From 1754 to 1763 France and Great Britain fought each other in the French and Indian War. The war was part of a bigger war, called the Seven Years' War, in Europe. However, the French and Indian War took place in North America. Even though France got help from its Native American allies, Britain won the war. The victory gave Britain control over most of the colonies in North America.

Background

In the middle of the 1700s both Britain and France controlled land in North



The British general Edward Braddock was badly wounded in the fight for Fort Duquesne in 1755. He left the battlefield on a cart and died soon afterward.

America. Britain controlled the 13 colonies that later became the United States. France's lands were called New France. New France included large parts of what is now eastern Canada. It also covered much of the Great Lakes region and areas west of the Appalachian Mountains.

Both countries wanted the upper Ohio River valley, in what is now northeastern Ohio and western Pennsylvania. The French were trading with the Native Americans, while people from the British colonies were starting settlements. Both sides built forts in the area.

War

War began in 1754, when British colonial troops under George Washington tried to drive the French from what is now western Pennsylvania. They failed. British soldiers arrived in 1755. They lost a battle for Fort Duquesne, near what is now Pittsburgh.

The next few years of the war continued to be difficult for the British. The French had a better army, and the Native Americans knew how to fight in the woodlands.

By the end of 1757, however, the British had begun to gain ground. They had collected more money and better supplies than France. They also had become experts in wilderness fighting. By 1760 the British had captured all of New France. The war ended when Britain and France signed the Treaty of Paris on February 10, 1763.

► More to explore

Washington, George

French Guiana

A part of France lies on the northeastern coast of South America. French Guiana is an overseas department (a type of province) of France. Cayenne is its largest city and capital.

Geography

Suriname and Brazil border French Guiana. The Atlantic Ocean is to the north. About 10 miles (16 kilometers) off the coast is Devil's Island, once known for housing France's political prisoners and wartime spies. The land is mostly low-lying. The Tumac-Humac Mountains in the south rise to 2,300 feet (700 meters). The climate is hot and humid.

Plants and Animals

Tropical rain forests cover much of French Guiana. Animals of the region



Devil's Island was once known for the horrible treatment of prisoners there. Today the island is a popular tourist destination.

include tapirs, ocelots, sloths, great anteaters, armadillos, monkeys, and parrots.

People

Mulattoes, or people with both black and white ancestors, form the largest ethnic group in French Guiana. There are smaller groups of French, Haitians, Surinamese, Antilleans, Chinese, Brazilians, East Indians, and others. French is the official language, but different groups also speak their own languages. Most people are Roman Catholics. French Guiana has a small population for the amount of land it covers. Most residents live in urban areas along the coast.

Economy

French Guiana receives much of its income from a European rocket-launching base near the town of Kourou. Most people work for the government or in services, including health care, banking, and tourism. French Guiana also produces gold, shrimp, rice, meat, wood products, and rum.

History

The original inhabitants of French Guiana were Carib and Arawak Indians. French traders settled there in the 1600s. The French later brought African slaves to work on sugar plantations. By the mid-1800s France was sending prisoners to the territory. French Guiana became a department of France in 1946.

► More to explore

Rain Forest • South America

French Polynesia

French Polynesia is a group of about 130 islands in the southern Pacific Ocean. It lies between South America and Australia. French Polynesia is an overseas country of France. It mostly rules itself, but for some things it depends on the French government. The capital of French Polynesia is Papeete, on the island of Tahiti.

Geography

French Polynesia is part of the region called Oceania. Most of the islands are the



Volcanoes created Bora-Bora, an island in French Polynesia.

rugged tops of ancient volcanoes. Atolls make up the rest of the land. They are coral reefs surrounding a pool of water.

French Polynesia's climate is tropical. Sometimes the islands are hit by powerful storms called typhoons. Rain forests and coconut, breadfruit, and other fruit trees grow on the islands.

People

Most of the people of French Polynesia are Polynesian. They are descended from the people who first settled the islands. The rest of the population consists mostly of French and Chinese. Most of the people live in or around Papeete. They speak Polynesian languages or French. Most people are Christians.

Economy

Tourism is very important to French Polynesia's economy. Other industries include fishing and raising shrimp and oysters. Pearls, which are made by oysters, are a valuable export.

History

Polynesians might have settled on the islands as early as 200 BC. Europeans started arriving in the 1700s. France made Tahiti and some surrounding islands into a colony in 1880. In 1946 France made French Polynesia an overseas territory, which gave the islands some power to rule themselves. In 2004 France gave French Polynesia more independence and named it an overseas country.

► More to explore

France • Oceania • Volcano

French Revolution



There were many protests during the French Revolution. In 1789 a crowd marched to the royal palace in Versailles, France. They brought the royal family back to Paris (the French capital) to face the people's demands.

In 1789 the people of France began the French Revolution. The revolution brought down their king and made France a republic—a country ruled by the people. This republic did not last, but France never returned to its old, unequal form of society. The ideas of the French Revolution spread to many other countries.

Background

In the 1780s several groups in France were pushing for change in society. One of them was a new class of wealthy city people called the bourgeoisie. They wanted more power. Meanwhile, farm-

workers and other common people were tired of working hard for the nobles, or rich landowners. Many were angry about paying taxes that nobles did not have to pay. At the same time, French thinkers called philosophers called for new forms of society and government.

The French government was weak. It had spent too much money on costly wars. The most recent of its wars was the American Revolution, in which France had helped the colonists defeat the British. King Louis XVI and Queen Marie-Antoinette also spent a great deal of money on themselves while the rest of the country suffered.

Revolution Begins

To help him solve France's problems, Louis XVI called together the Estates-General in May 1789. The Estates-General was a group made up of representatives from the three classes, or estates, of French society: the church, the nobles, and the commoners. In June most of the commoners and some members of the other groups broke away from the Estates-General. They declared that they were now a National Assembly that represented the entire country.

On July 14 a crowd in Paris stormed an old prison called the Bastille. The crowd released the prisoners that the government had held there. This event is now considered the start of the French Revolution.

A New Government

Other regions in France followed the lead of Paris and formed revolutionary

governments. Peasants in many places burned the castles of the wealthy land-owners. After that some nobles willingly gave up their privileges.

In August 1789 the National Assembly approved the Declaration of the Rights of Man and of the Citizen. This important document stated that all people are born free and have equal rights. The National Assembly also made many changes that would affect all the French people. It said that peasants no longer had to farm nobles' land for no pay. The Assembly also took property away from the Roman Catholic church. Finally, it gave most male citizens the right to vote.

At first the National Assembly let the king remain on the throne. But in September 1792 France changed its form of government from a kingdom to a republic. In 1793 the revolutionaries put Louis and Marie-Antoinette to death.

Reign of Terror

The French republic had a new assembly called the National Convention. Soon an extreme group called the Jacobins took control of it. They feared that not enough people supported the revolution. They began a period called the Reign of Terror.

The Jacobins arrested more than 300,000 people for being against the revolution. They put at least 17,000 people to death. Many had their heads cut off by a new machine called the guillotine. Finally, in July 1794 other members of the Convention arrested the



Maximilien de Robespierre was a leader during the Reign of Terror. He was blamed for many of the killings that took place. In 1794 Robespierre was arrested and executed.

leaders of the Reign of Terror. They sent these leaders to the guillotine.

Rise of Napoleon

In 1795 a less extreme government called the Directory took power. However, the Directory did not provide strong leadership. In 1799 Napoleon Bonaparte, a successful young general, did away with the Directory. He made himself the leader of a new government called the Consulate.

Napoleon grew so powerful that in 1804 he declared himself Napoleon I, emperor of France. Emperors and kings then ruled France for most of the next 70 years. France finally became a republic for good in 1871.

► More to explore

Bastille Day • France • Louis XVI
• Marie-Antoinette • Napoleon

Frog

Frogs are small animals that can jump very well. Frogs are similar to toads. However, a frog has smooth skin and long legs. A toad has rough skin and shorter legs.

Frogs are found throughout the world except in very cold places. They are most common in rain forests. Frogs are amphibians, meaning that they can live in water or on land. Most frogs spend most of their lives in water. Some live in underground holes or in trees.

A frog has smooth, moist skin and big, bulging eyes. Its hind legs are more than twice as long as its front ones. Most frogs have webbed back feet to help them leap and swim. Tree frogs have sticky disks on the tips of their fingers and toes. These disks help them climb slippery surfaces.



The red-eyed tree frog is a brightly colored frog that lives in rain forests of Central and South America.



The bullfrog is the largest North American frog. It can be 8 inches (20 centimeters) long.

Many frogs are tiny. They can be less than an inch (2.5 centimeters) long. The largest frogs are about a foot (30 centimeters) long. Most frogs are green, brown, gray, or yellow. Some are brightly colored.

A frog catches prey by flicking out its long, sticky tongue. Most frogs eat insects and worms. Some also eat other frogs, rodents, and reptiles.

Frogs have glands in their skin that make poison. But this poison does not protect them from snakes, birds, and other enemies. Instead, frogs most often protect themselves by blending in with their surroundings.

Frogs usually lay their eggs in water. Within a few weeks the eggs hatch into tadpoles. Tadpoles are fishlike creatures that breathe through gills instead of lungs. To become an adult frog, a tadpole loses its tail and develops lungs and limbs.

► More to explore

Amphibian • Toad

Fruit



Fruits are an important part of a healthy diet. They contain fiber as well as many minerals and vitamins.

A fruit is the part of a flowering plant that contains the seeds. The skin of a fruit may be thin, tough, or hard. Its insides are often sweet and juicy. But some fruits, including nuts, are dry. Fruits develop from a plant's flowers.

Some foods that people call vegetables are actually fruits. For example, cucumbers, squashes, and tomatoes are all fruits. They contain seeds, while true vegetables do not. True vegetables are the stems, leaves, or roots of plants.

There are two main types of fruit: fleshy fruits and dry fruits. In fleshy fruits, the part of the fruit around the seeds is juicy and soft. Apples, berries, oranges, and other fleshy fruits contain many seeds. Some fleshy fruits—for example, cherries and peaches—contain only one seed, or pit. These are called stone fruits. Dry fruits are not as juicy as fleshy fruits. Dry fruits include beans and nuts.

People and many wild animals eat fresh fruits. Fruits are important sources of fiber and vitamins, especially vitamin C. They contain minerals and a large amount of water.

People also eat frozen, canned, and dried fruits. They make fruits into jams and jellies. They add fruits to a variety of desserts and main dishes. People also drink the juice of fruits.

► More to explore

Flower • Nut • Seed • Vegetable

Fuchsia

Fuchsias are flowering plants. They are known for their brightly colored, hanging flowers. Many people grow fuchsias in gardens and window boxes. Hummingbirds also like fuchsias.

Fuchsias can be found in Central America, South America, Europe, and



Fuchsia plants are prized for their drooping flowers.

the United States. They grow best in sheltered areas. Fuchsias need to be kept away from strong winds. They also need to be protected from heat.

There are about 100 species, or kinds, of fuchsia. They can be small plants, shrubs, or trees. Fuchsia flowers can be many colors, including white, red, pink, and purple. The color fuchsia, a bright reddish purple, got its name from these plants. Fuchsias also come in many sizes. Some are 6 inches (15 centimeters) tall. Others grow to 18 feet (5.5 meters).

The main part of a fuchsia flower is shaped like a tube or a bell. At the end are four brightly colored petals. The colors attract hummingbirds and insects. These animals drink the flowers' nectar, which is a sweet liquid. When they do this, pollen sticks to their bodies. The animals then carry the pollen to other flowers. This is how fuchsias reproduce, or create new plants.

► More to explore

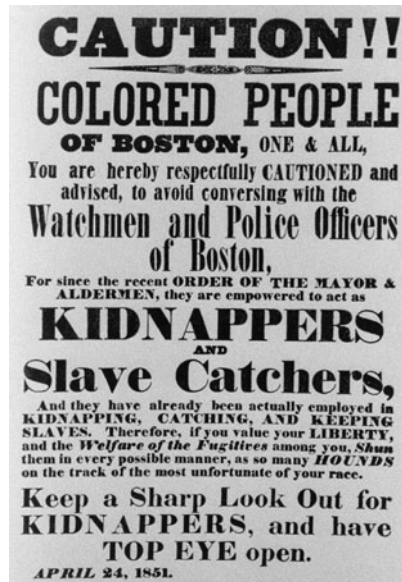
Flower • Pollen

Fuel

► see Fossil Fuel.

Fugitive Slave Acts

In the United States before the American Civil War many people in the Southern states owned slaves. The Northern states did not allow slavery.



A notice warned African Americans in Boston, Massachusetts, a city in the North, about the Fugitive Slave Act of 1850.

Slaves therefore often tried to escape from the South to the North. To stop this, Congress passed two laws called the Fugitive Slave Acts, in 1793 and 1850. The laws stated that escaped, or fugitive, slaves must be returned to their owners. These laws applied even if an escaped slave was captured in a free state (state with no slavery). The second act was so harsh that it became a major problem between the North and the South.

Fugitive Slave Act of 1793

The U.S. Constitution of 1789 stated that escaped slaves had to be returned to their owners. Congress passed the Fugitive Slave Act of 1793 to enforce this part of the Constitution. The act allowed any slaveholder to capture a suspected runaway slave and bring the slave before a judge. The judge alone then decided whether the slave was a runaway.

The act angered abolitionists, or people who opposed slavery. Northern states voted to give some legal rights to escaped slaves. Abolitionists formed a secret network called the Underground Railroad to help slaves escape.

Fugitive Slave Act of 1850

Southern states soon demanded stronger laws to protect slavery. In 1850 Congress passed the second Fugitive Slave Act. The new act set severe penalties for anyone who helped a slave to escape.

The main effect of this act was to strengthen the abolitionist movement. Eventually the disagreement over slavery led to the American Civil War. During the war, the government sometimes enforced the Fugitive Slave Acts. In 1864 Congress finally did away with the acts.

► **More to explore**

Abolitionist Movement • American Civil War • Slavery • Underground Railroad

Fuji, Mount

The highest mountain in Japan is Mount Fuji, or Fujiyama. It rises to a



Mount Fuji is considered the sacred symbol of Japan.

height of 12,388 feet (3,776 meters). A volcano, Mount Fuji last erupted in 1707. It lies near the Pacific Ocean on the island of Honshu. Tokyo, Japan's capital, lies 60 miles (100 kilometers) to the east.

Many Japanese consider Mount Fuji to be sacred. Its name means “everlasting life.” Temples and shrines surround the mountain. The Sengen (Asama) Shrine, at the western foot, has been the main shrine for worship of Mount Fuji since the 800s. The city of Fujinomiya has developed around the shrine.

Climbing Mount Fuji has long been a religious practice. Today huge crowds flock there, mostly during the climbing season from July 1 to August 26. Cities such as Fuji and Gotemba, at the foot of the mountain, serve as bases for thousands of climbers.

► **More to explore**

Japan • Mountain • Volcano

Funafuti Atoll

Funafuti Atoll is a group of about 30 small islands in the Pacific Ocean. They are part of the country of Tuvalu. The capital of Tuvalu, named Vaiaku, is on one of the islands in Funafuti Atoll. The islands are made of coral. They form a ring around a pool of water.

About half the people of Tuvalu live on Funafuti Atoll. Most of them make a living by fishing and farming.

Great Britain took over all the islands of Tuvalu in 1892. The United States built military bases on Funafuti Atoll in 1943, during World War II. Tuvalu became an independent country in 1978. Vaiaku became its center of government.

► More to explore

Coral • Tuvalu

Fungus

A fungus is a simple organism, or living thing, that is neither a plant nor an animal. When there is more than one fun-

gus they are called fungi. Some familiar fungi are mushrooms, molds, mildews, truffles, and yeasts.

Fungi are found all over the world. They grow especially well in mild, moist regions and in the tropics. Fungi can be found in the water, soil, and air. Some live on or inside plants and animals.

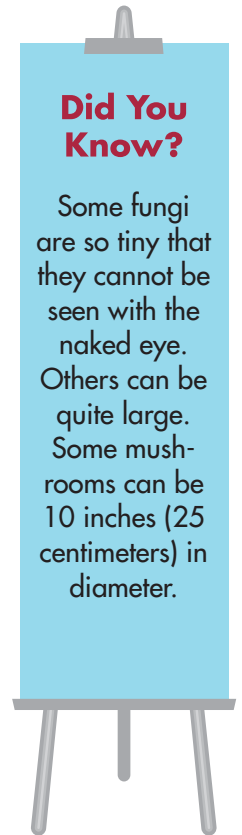
A fungus is usually a mass of threadlike strands. A fungus usually reproduces by forming tiny cells called spores. Some fungi have a special part that makes spores. This is usually the part of a fungus that can be seen. For example, a mushroom is the spore-producing part of a fungus that is mostly underground. Wind, water, and insects carry spores away from the fungus that made them. If a spore lands in a damp place, it can grow into a new fungus.

A fungus grows by feeding on other organisms. Most fungi feed on dead plant and animal material. They are called saprophytes. These fungi help the environment by breaking down fallen trees, animal droppings, and other dead matter. But saprophytes can also ruin foods such as bread, cheese, and fruits and vegetables. Some saprophytes destroy timber, textiles, paper, and leather. Other fungi get their food from living plants and animals. These fungi are called parasites. Parasitic fungi often sicken or kill the organisms they attack.

Some fungi are useful. Many mushrooms and truffles can be eaten. Some yeasts are used to bake bread. In addition, penicillin and many other drugs

Did You Know?

Some fungi are so tiny that they cannot be seen with the naked eye. Others can be quite large. Some mushrooms can be 10 inches (25 centimeters) in diameter.



Bracket fungi sometimes look like shelves growing on trees.

called antibiotics come from fungi. Antibiotics are used to treat certain infections in people.

► More to explore

Antibiotic • Living Thing • Parasite

Fur Trade



Native Americans traded furs for supplies at places called trading posts.

The fur trade was a booming business in North America from the 1500s through the 1800s. When Europeans first settled in North America, they traded with Native Americans. The Native Americans often gave the settlers animal furs in exchange for weapons, metal goods, and other supplies. The settlers then sold many of the furs back to Europe. There, wealthy people had a high demand for furs. They used beaver, fox, mink, and other types of fur for hats and clothing. Eventually several fur-trading companies in North America grew rich by selling furs to Europe.

Two important figures in the early history of fur trading were Pierre Esprit de Radisson and Médart Chouart, sieur de Groseilliers. These two Frenchmen become successful fur traders in the middle of the 1600s. This brought them to the attention of King Charles II of England. In 1670 King Charles set up the Hudson's Bay Company to trade for fur in what is now Canada. He put Radisson and Groseilliers in charge of the company.

Over the next 150 years the successful Hudson's Bay Company faced many competitors. One of these was the North West Company, set up by French adventurers in 1783. In 1808 a German American businessman named John Jacob Astor opened the American Fur Company. Sometimes the companies traded with Native Americans for furs. Sometimes they bought furs from white men, called trappers.

Their search for furs led trappers to explore large areas of the continent. Because of their knowledge of the land they were able to serve as guides for later settlers.

North American fur-trading companies supplied many furs into the 1900s. But since then, furs have become much less popular. Today many people think that killing animals for their fur is wrong.

► More to explore

Americas, Exploration and Settlement of the • Hudson's Bay Company • Native Americans



Geronimo was a warrior and leader of the Apache Native Americans.

(See Geronimo.)

Some giant sequoias are more than 280 feet (85 meters) tall.

(See Giant Sequoia.)

The Strait of Gibraltar is a waterway located between Spain and Africa.

(See Gibraltar.)

Glaciers, or large areas of thick ice, store about three fourths of all the freshwater in the world.

(See Glacier.)

Silica, or sand, is the main ingredient of glass.

(See Glass.)

Gymnasts compete in three types of gymnastic events at the Summer Olympics.

(See Gymnastics.)



Gabon

The small nation of Gabon is one of the richest countries in Africa, thanks to its large petroleum (oil) deposits. Gabon's capital and largest city is Libreville.

Geography

Gabon lies along the equator on Africa's west coast. It is bordered by Equatorial Guinea, Cameroon, the Republic of the Congo, and the Atlantic Ocean. A low-lying plain along the coast rises to plateaus and mountains in the interior. The Ogooué River flows through the center of Gabon. The weather is hot and humid.

Plants and Animals

Dense rain forests cover much of Gabon. Its wild animals include antelope, monkeys, gorillas, and elephants.

People

There are more than 40 ethnic groups in Gabon. The Fang people form the largest group. Small groups of Pygmies live



Gabon has created a number of parks and reserves to protect its rain forests.

in the rain forests. The people of Gabon speak many different Bantu languages, but French is the official language. The majority of the population is Christian.

Economy

Gabon's economy is based on its natural resources, especially petroleum. Gabon also produces wood products and the metal manganese. Most farmers grow enough to feed only their families. Crops include plantains and sugarcane.

History

Pygmies and Bantu-speaking peoples lived in Gabon when Portuguese explorers arrived in 1472. The Portuguese and other Europeans used the coast for the slave trade. In 1849 France established Libreville (meaning "free town") as a settlement for freed slaves. In 1886 Gabon became a French colony. Gabon gained independence in 1960.

► **More to explore**
Libreville • Petroleum

Facts About GABON



Population
(2008 estimate)
1,486,000

Area
103,347 sq mi
(267,667 sq km)

Capital
Libreville

Form of government
Republic

Major cities
Libreville, Port-Gentil, Franceville, Oyem, Moanda



Gaborone



Population
(2004 estimate)
199,600

Gaborone is the capital of Botswana, a country in southern Africa. It is the largest city in Botswana. Gaborone is also the country's center of education, business, and banking. The city's economy is based on services and trade. Several businesses in Gaborone deal with diamonds.

Gaborone is a fairly new city. The British built a fort near the city site in 1887. At that time Great Britain controlled the Botswana area. The area was then called Bechuanaland. In 1964 a city was built near the fort to be the new capital of Bechuanaland. Bechuanaland became the independent country of Botswana in 1966. Gaborone was its capital. The

city's population grew rapidly in the late 20th century.

► More to explore

Botswana

Gadsden Purchase

In 1853 the United States bought a large piece of land from Mexico. That sale is known as the Gadsden Purchase. It moved the border between the two countries south, to where it lies today. The Gadsden Purchase is named for James Gadsden, a U.S. businessman who helped to bring about the purchase.

Background

At the end of the Mexican War in 1848, the United States took more than 525,000 square miles (1,360,000 square kilometers) of land from Mexico. That land later became the states of California, Colorado, Nevada, Texas, and Utah. The land also included the northern parts of what are now Arizona and New Mexico.

At that time, James Gadsden was president of the South Carolina Railroad Company. He wanted to create the first transcontinental railroad—a railroad across the entire continent. He believed the best route for this new railroad was through part of northern Mexico. U.S. president Franklin Pierce agreed with Gadsden's idea. Pierce sent Gadsden to Mexico to buy land for the railroad.

Did You Know?

Completed in 1869, the first trans-continental railroad went through the Rocky Mountains, not across the land Gadsden had purchased.



A worker's hands sort rough diamonds in Gaborone, Botswana. Diamonds are Botswana's most valuable product.



The United States issued a postage stamp 100 years after the Gadsden Purchase. The stamp honored the pioneers who settled on the land that was purchased from Mexico.

The Purchase

Gadsden met with Mexico's president, Antonio López de Santa Anna, in 1853. Mexico badly needed money, so Santa Anna agreed to sell the land that Gadsden wanted. The United States paid 10 million dollars for almost 30,000 square miles (78,000 square kilometers) of land. The land would become the southern parts of Arizona and New Mexico.

► More to explore

Mexican War • Railroad

Galápagos Islands

The Galápagos Islands are famous because of the scientist Charles Darwin. After studying the plants and animals on the islands in the 1800s, Darwin developed his theory of evolution. The theory explains how living things change over time. It changed the science of biology forever. Darwin was not the first person

to see the Galápagos Islands, but they were not a common destination before his visit. They are so far from other land that they are sometimes called “world’s end.”

The Galápagos consist of 13 major islands, 6 smaller islands, and many very small islands called islets. They lie along the equator in the eastern Pacific Ocean, 600 miles (1,000 kilometers) west of Ecuador.

The Galápagos were formed by volcanoes. Some of the volcanoes are still active. The landscape includes many mountains, craters, and cliffs. The islands receive little rainfall, and temperatures are fairly low.

Because the Galápagos are so isolated, the plants and animals found there are very unusual. Cactus forests grow in the dry lowlands, while the uplands are covered with thick, moist vegetation, such as ferns and mosses. Giant tortoises were once so abundant that Spanish explorers named the islands for them. The Spanish word *galápagos* means “tortoise.” The islands also have rare marine iguanas.





Isabela Island is the largest of the Galápagos Islands. Giant tortoises can be found there.

The Galápagos Islands belong to Ecuador, and most of the people living there are Ecuadorans. They live on the larger islands. Many of the islands have no people. The island of Baltra has a military base. Tourism, fishing, and agriculture are the main parts of the economy.

► More to explore

Darwin, Charles • Ecuador • Evolution

Galaxy

A galaxy is a group of stars, clouds of gas, and dust particles that move together through the universe. There are billions of galaxies in the universe. They probably formed billions of years ago, soon after the universe began.

The sun, Earth, and the other planets of the solar system are part of the Milky Way galaxy. Most galaxies move through the universe as part of clusters, or groups, of galaxies. The Milky Way is at one end of a cluster called the Local Group. It includes about 40 galaxies.

Size

Even the smaller galaxies are made up of millions of stars. These galaxies may be 5,000 light-years across. (A light-year is the distance light travels in a year—about 5.8 trillion miles, or 9.5 trillion kilometers.) The Milky Way is roughly 20 times larger than that. It includes hundreds of billions of stars. The largest galaxies are even more huge and contain trillions of stars.

Shape

Galaxies are divided into three main categories based on their shape: spiral, elliptical, and irregular. Spiral galaxies look like pinwheels. They have a central disk and two or more curved arms winding outward. The disk consists mainly of older stars, while the arms have younger stars. The arms contain much dust and gas, from which new stars can form. The Milky Way is a spiral galaxy.

An elliptical galaxy may be shaped like a round ball or may be more stretched out, like an American football. It has more stars near its center and fewer stars



The Whirlpool Galaxy is a large spiral galaxy. To the right is a smaller galaxy.

in its outer regions. Elliptical galaxies vary widely in size. Small elliptical galaxies are the most common kind of galaxy in the universe.

Unusually shaped galaxies are called irregular galaxies. They are not very common. Many of them have no obvious center point. Some of them appear to be the result of a crash between several galaxies.

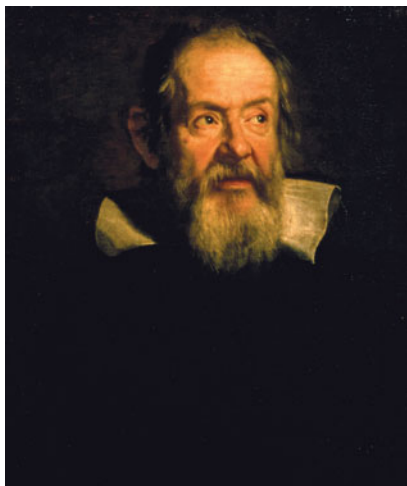
► More to explore

Milky Way • Star • Universe

Galileo

Galileo has been called the founder of modern science. He was one of the first people to examine the heavens with a telescope. He also made breakthrough discoveries in the study of motion.

Galileo Galilei, who is generally known by his first name, was born in Pisa, Italy, on February 15, 1564. He entered the University of Pisa to study medicine but later switched to mathematics.



Galileo

Early Work

Galileo was interested in studying the effect of forces on the motion of bodies. In the Cathedral of Pisa he observed a chandelier swaying back and forth. He realized that it took the same time for each swing, whether the swings were large or small. This discovery became known as the law of the pendulum. It led to the use of the pendulum to keep track of time.

Use of the Telescope

In about 1609 Galileo learned of the invention of the telescope in the Netherlands. He later built his own version. The telescope allowed Galileo to make discoveries about space. On January 7, 1610, he discovered four moons revolving around the planet Jupiter. In his honor, these bodies are known as the Galilean satellites.

Discoveries Galileo made provided evidence that the sun is the center of the solar system. Nicolaus Copernicus, another famous astronomer, had put forth this theory in 1530.

Punishment and Death

Galileo's studies brought him into conflict with the Roman Catholic church. The church still taught that Earth was the center of the universe. Galileo was ordered not to teach or defend the ideas of Copernicus. He continued to do so, however.

In 1633 Galileo was brought before the Inquisition, a Roman Catholic institution that held power then. He was pun-

ished by being told he could not leave his house.

Galileo became blind in 1637 but continued to work. He died on January 8, 1642.

► More to explore

Pendulum • Telescope

Gama, Vasco da



Vasco da Gama

The Portuguese navigator Vasco da Gama made three sea voyages to India between 1497 and 1524. His voyages opened a sea route from Western Europe to the East and made Portugal a world power.

Early Life

Little is known about Vasco da Gama's early life. He was born in the Alentejo province in southwestern Portugal in about 1460. His father, Estêvão da Gama, was the commander of a fortress there. Vasco's studies probably included mathematics and navigation.

Voyages

In 1495 the Portuguese king asked da Gama to lead an expedition eastward to India. In da Gama's time, Europeans wanted many goods from the East, particularly spices. Muslim traders controlled the land routes to the East. The Portuguese and Spanish monarchs knew that if they could control another trade route to the East, they would gain great wealth and power. They were eager to find a sea route to India. Another Portuguese explorer, Bartolomeu Dias, had earlier discovered that there was a passage around the bottom of Africa called the Cape of Good Hope. But he had not made it to India.

Da Gama made three voyages to India. On the first voyage, from 1497 to 1499, he and his fleet reached Calicut, an important trading center in southern India. However, da Gama was unable to make a trade agreement with the ruler of the city. Da Gama returned to Portugal with samples of spices and precious stones.

On his second trip, in 1502–03, da Gama returned to Calicut but also went on to Cochin, where he made an agreement with the ruler of that city. In 1524 da Gama was sent back to India as the Portuguese viceroy, or governor. His task was to improve the administration of the Portuguese colony at Goa, on the west coast of India. Da Gama reached Goa in September 1524. He soon fell ill, possibly because of overwork. Da Gama died in Cochin on December 24, 1524.

Did You Know?

On his first trip to India, da Gama offended Calicut's ruler by offering him trade goods of poor quality.



Gambia, The

The Gambia is the smallest self-governing country in Africa. It is located on the continent's west coast. The capital is Banjul.

Geography

The Gambia is a narrow strip of land. It is 295 miles (475 kilometers) long but only 15 to 30 miles (24 to 48 kilometers) wide. Except for a short coastline on the Atlantic Ocean, The Gambia is surrounded by Senegal. The Gambia River flows westward through the country into the Atlantic. The Gambia has warm weather and a long dry season.

Plants and Animals

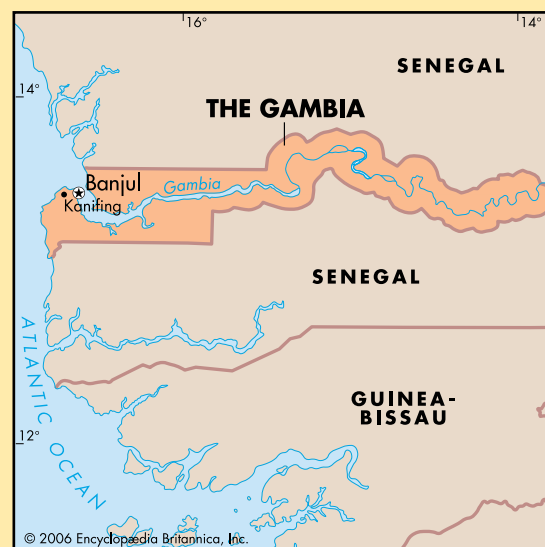
Savanna, or grassland with scattered trees, covers most of the country. Mangroves, oil palms, cedars, mahogany trees, and rubber vines grow near the river. The Gambia is home to leopards, wild boars, monkeys, antelope, crocodiles, and hippopotamuses.

People

The Malinke (or Mandingo) people make up more than one third of the population. The Fulani, the Wolof, the Diola, and the Soninke are other important ethnic groups. The official language is English, but Wolof and Mandingo are widely spoken. Nearly all the people are Muslims. Most people live in rural areas.

Economy

The majority of Gambians are farmers who grow food for themselves. Crops



include millet, peanuts, rice, corn, sorghum, and vegetables. The Gambia's most important export is peanuts. Tourism and shipping also contribute greatly to the economy.

History

The Malinke and the Wolof developed kingdoms in the region before the Portuguese arrived in the mid-1400s. Great Britain took control in the late 1700s. The region was a major source of slaves until the early 1800s.

The Gambia gained independence in 1965. From 1982 to 1989 The Gambia and Senegal were united as the confederation of Senegambia. In 1994 the military overthrew The Gambia's government, but presidential elections resumed two years later.

► More to explore

Banjul • Senegal

Facts About THE GAMBIA



Population
(2008 estimate)
1,754,000

Area
4,127 sq mi
(10,689 sq km)

Capital
Banjul

Form of government
Republic

Major cities
Kanifing,
Brikama, Banjul

Gandhi, Indira

As a child Indira Gandhi had an interest in politics. These early years foretold her future. As an adult Gandhi became the prime minister, or leader, of India.

Early Life

Indira Nehru was born on November 19, 1917, in Allahabad, India. At that time Great Britain ruled India. Many Indians disliked this rule by outsiders and fought against it. They created a political party called the Indian National Congress.

Children also joined the fight for independence. They formed their own organization: the Monkey Brigade. At only 12 years old Indira became the leader of the Monkey Brigade. As she grew up Indira stayed active in politics. She joined the Indian National Congress. She married Feroze Gandhi, a journalist, in 1942.



Indira Gandhi addresses a crowd in Delhi, India, in 1971.

Career

In 1947 India won independence from Great Britain. Indira Gandhi's father, Jawaharlal Nehru, became prime minister. Gandhi worked closely with her father. She became president of the Indian National Congress in 1959.

In 1967 Gandhi was elected prime minister of India. She served until 1977, when she lost a national election. But in 1980 she became prime minister again.

By that time some followers of the Sikh religion had begun to fight for complete independence from the Indian government. Gandhi considered these Sikhs terrorists. In June 1984 she ordered an attack on the Golden Temple, the Sikhs' holiest place. More than 450 Sikhs died.

On October 31, 1984, two Sikhs got revenge. While working as Gandhi's bodyguards, the Sikhs assassinated Gandhi in her garden.

► More to explore

India • Nehru, Jawaharlal • Sikhism

Gandhi, Mahatma

Mohandas Gandhi was a leader of India's independence movement. When India was a colony of Great Britain, Gandhi used nonviolent methods to protest against British rule. His efforts earned him the title Mahatma. Mahatma means "great soul."

Did You Know?

Before becoming prime minister, Gandhi served as the minister of information and broadcasting, an important job in Indian government.



Mahatma Gandhi shares a laugh with his granddaughters.

Early Life

Mohandas Karamchand Gandhi was born on October 2, 1869, in Porbandar, India. In his youth he learned the religions of Hinduism and Jainism. Non-violence is one of Jainism's main ideas.

Politics in South Africa

In 1893 Gandhi took a job in South Africa. At the time it was also a British colony. There he saw Europeans mistreating Indian settlers. He got into politics to fight for Indian rights.

Gandhi first used his method of nonviolent protest in 1906. He told Indians that they should not obey the British laws that they thought were wrong. He also said they should stay peaceful no matter how they were punished for their actions.

Protests in India

Gandhi returned to India in 1915. Within a few years he became India's most powerful political leader. He led several major protests against the British. He was sometimes jailed for his actions.

Independence

India won its independence in 1947. It was a great victory for Gandhi. But he was disappointed because Hindus and Muslims fought each other. He tried to make peace. On January 30, 1948, in the city of Delhi, Gandhi was shot and killed by a Hindu man.

► More to explore

India

Ganges River

Followers of Hinduism believe that dying on the banks of the Ganges River and having one's ashes cast on its waters is the way to a happy afterlife. One of the world's great rivers, the Ganges flows across the plains of northern India for most of its course. In India the river is called the Ganga.

The Ganges is 1,560 miles (2,510 kilometers) long. It begins in the southern Himalayas, near India's border with the Chinese region of Tibet. After emerging from the mountains, the river flows onto the plains. Midway in its course, the



Ganges merges with the Yamuna River. It then flows into Bangladesh, where it is joined by the mighty Brahmaputra River. The combined stream empties into the Bay of Bengal.

Hindus make religious pilgrimages to many places along the Ganges. They believe that bathing in its waters washes away sin. Hindus also have built many temples for cremating, or burning, the dead along the Ganges. They scatter the ashes on the river, believing that the dead will go straight to heaven.

Water from the Ganges has been used for irrigation for more than 2,000 years. Rice and other crops grown in the Ganges region feed most of India and Bangladesh.

► More to explore

Delta • Hinduism • India • Irrigation
• Pilgrimage

Garden

People have been growing plants in special areas of land, called gardens, since ancient times. Early gardens led to the many different kinds of gardens that people enjoy today.

Types of Gardens

The first gardens had useful purposes. They provided food and herbs. Herbs are plants that are used as medicines or for adding flavor to food. Vegetable and herb gardens remain popular today for the same reasons.



A mother and a daughter work in their garden.

People grow flower gardens, such as rose gardens, for their beauty. Cottage gardens are a well-known kind of flower garden, especially in England. They have showy flowers bunched tightly together. An indoor garden is called a conservatory. Gardens can be large areas set aside by a city or they can be a small plot in a backyard.

Botanical gardens are large gardens that are usually open to the public. Botanists,



A path of purple flowers blooms between rows of trees at Keukenhof Gardens near Amsterdam, The Netherlands.

Did You Know?

Tulips became so popular in Europe in the 1600s that the price of some bulbs rose to thousands of dollars each.

or scientists who study plants, help to grow botanical gardens. These gardens are organized in a scientific way. Groups of plants from similar climates grow in different sections of a botanical garden.

History

People began growing plants about 10,000 years ago. This was the earliest form of agriculture, or growing plants for food and other uses. People in ancient China, Egypt, and the Middle East later grew gardens for their beauty. In the 1600s the Dutch sold many tulip bulbs to Europeans who wanted to grow the flowers in their gardens. Today's gardens may contain plants from almost anywhere in the world.

► More to explore

Agriculture • Flower • Herb

Garfield, James A.

James A. Garfield, the 20th president of the United States, held office for less than a year. Garfield was shot four months after taking office and died slightly more than two months later, in September 1881.

Early Life and Career

James Abram Garfield was born in a log cabin near Orange, Ohio, on November 19, 1831. He grew up on his family's farm. Garfield graduated from Williams College in Massachusetts in 1856. In 1858 Garfield married Lucretia Rudolph. They had seven children.



James A. Garfield

Military and Political Career

After studying law and becoming a minister, Garfield turned to politics. He joined the Republican Party and was elected to the Ohio legislature in 1859.

When the American Civil War started in 1861, Garfield fought in several battles for the North. In 1862 Ohio elected Garfield to the U.S. House of Representatives. Serving until 1880, Garfield supported strict policies toward the defeated South. In 1880 the Ohio legislature elected him to the U.S. Senate. That year Republicans chose Garfield to run for president. He defeated General Winfield Scott Hancock, another Civil War veteran.

Presidency

President Garfield soon angered the conservative Republicans known as the Stalwarts. The leader of the Stalwarts, Senator Roscoe Conkling, gave out gov-



TIMELINE

Garfield is born near Orange, Ohio.

November 19, 1831

Garfield is elected to the U.S. House of Representatives.

1862

Garfield fights for the North in the American Civil War.

1861–63

Senator Roscoe Conkling resigns.

May 1881

Garfield is elected president.

1880

Garfield dies.

September 19, 1881

Garfield is shot in the back.

July 2, 1881

ernment jobs as rewards. Garfield wanted more control over that process. When he gave a job to one of Conkling's enemies, Conkling resigned from the Senate. Garfield's actions strengthened the power of the presidency.

A Stalwart supporter, Charles J. Guiteau, became angry when Garfield refused to give him a job. On July 2, 1881, Guiteau shot Garfield in the back at a railroad station in Washington, D.C. The president lay ill for 80 days before dying on September 19, 1881, in New Jersey. Vice President Chester A. Arthur became president the next day.

► More to explore

American Civil War • Arthur, Chester A.
• United States

the building's walls. Most gargoyles are carved from a block of solid stone. They are made to look like animals, monsters, laughing or scowling humans, dragons, or demons. A channel, or groove, cut along the top of the statue directs rainwater away from the building through



Gargoyles sit on top of Notre Dame Cathedral in Paris, France.

Gargoyle

Gargoyles are waterspouts set high on a building that direct rainwater away from

Did You Know?

Carvings of strange creatures that are not waterspouts are called grotesques, not gargoyles.

the gargoyle's open mouth and onto the streets below. Today people often call any stone carving of a strange creature a gargoyle. However, if such carvings are not waterspouts they are not technically gargoyles.

Gargoyles have been used for more than 2,000 years. They were most popular in parts of Europe during the later Middle Ages, from about AD 1000 to 1500. During that time the largest and most important building in any town was the church or cathedral. Those buildings were costly to build. Rainwater running down the walls would eventually ruin the building. Therefore, workers carved decorative statues to act as waterspouts. At the end of the Middle Ages people began using lead drainpipes, so true gargoyles became less common.

► More to explore

Cathedral • Middle Ages

Garlic

Garlic is a plant that is closely related to the onion. Its bulbs are a very popular cooking ingredient. The garlic plant belongs to the lily family. Its scientific name is *Allium sativum*.

Garlic first grew in central Asia. Today it also grows wild in Italy and southern France. In the United States garlic is grown mostly in California.

There are dozens of varieties of the garlic plant. The top of the stalk usually produces flowers and bulblets, or tiny bulbs. The useful garlic bulbs are in the soil.



The useful part of a garlic plant is the bulb that grows underground.

Each bulb contains up to 20 sections, called cloves. The cloves are covered by a thin, papery skin. The garlic plant does not produce seeds. New plants grow from planted bulblets or cloves.

Garlic has a powerful, onionlike smell and a strong taste. Peeled cloves may be chopped up or crushed to flavor sauces, stews, and salad dressings. Since ancient times garlic has also been used in medicine. In addition, people once carried garlic as a charm to keep away vampires and other supposed evils.

► More to explore

Lily • Onion

Garvey, Marcus

Marcus Garvey was a black leader of the early 1900s. He encouraged blacks to be proud of their African heritage. His goal was to start a new black country in

Africa. Garvey had so many followers that he was known as the Black Moses.

Marcus Moziah Garvey was born on August 17, 1887, in Saint Ann's Bay, Jamaica. As a young man he worked to improve conditions for black workers in Jamaica and elsewhere. In 1912 he moved to London, England. There he met blacks from many countries. He became very interested in African history and culture.

Garvey returned to Jamaica in 1914. He founded a group known as the Universal Negro Improvement Association (UNIA). In 1916 Garvey went to the United States to start UNIA offices there.

Garvey taught that blacks would be respected only when they were successful in business. He started a newspaper and several companies. He also promised to create a black-governed country in



Marcus Garvey was named Jamaica's first national hero in 1964.

Africa. At that time European countries ruled nearly all of Africa as colonies.

In the early 1920s Garvey was found guilty of fraud (cheating people out of money). He lost many of his supporters and spent two years in jail. After being released in 1927, Garvey was forced to leave the United States. Garvey died in London on June 10, 1940.

► More to explore

Jamaica

Gas, Natural

Many stoves and home furnaces burn a fuel called natural gas. Natural gas is really a mixture of several different gases that formed slowly beneath Earth's surface.

How Natural Gas Formed

Natural gas often formed along with petroleum (oil) hundreds of millions of years ago. As plants and tiny animals died, their remains built up in many layers. Underground pressure and heat gradually changed the remains into gas and petroleum.

Types of Gas

The gases that make up natural gas include methane, ethane, propane, butane, and other substances. Because these gases burn very easily, they are valuable as fuels.

Gas may also be made from coal and petroleum. This type of gas is called manufactured gas.

Did You Know?

Russia has the largest group of natural gas reservoirs in the world.



A pumping station in Russia moves natural gas through a pipeline.

Mining and Transportation

Natural gas may be trapped in an underground pocket, or reservoir, above a deposit of petroleum. Natural gas may also be trapped in its own reservoir.

To get natural gas out of the ground, workers drill a well into the gas reservoir. The gas rises through a pipe to the surface. Special equipment then purifies, or cleans, the gas.

The clean gas may be stored underground or sent through pipelines to where it is needed. Gas pipelines can be hundreds of miles long. Natural gas may also be cooled into a liquid form and then shipped in tanks.

► More to explore

Fossil Fuel • Petroleum

Gecko

Geckos are small lizards known for their incredible climbing ability. There are about 750 species, or kinds, of gecko. They live in warm areas of the world in

a variety of habitats, from rain forests to deserts.

Geckos are among the world's smallest lizards. Most species are 1 to 6 inches (3 to 15 centimeters) long, including the tail. Geckos have a short, stout body and soft skin. Most are gray, brown, or dirty white, but a few kinds are green.

A gecko can climb very well because of the way its feet are designed. Each of its toes has thousands of tiny hairs on the bottom. At the end of each hair are hundreds of even tinier pads. As a gecko climbs, these pads spread out to create a strong sticking power. They allow a gecko to climb up polished glass walls and even run across ceilings.

Geckos usually are active at night, when they feed on insects. Unlike other rep-



Geckos are great climbers because their feet stick to many surfaces.

tiles, most geckos have a voice. Their sounds range from soft clicks or chirps to sharp cackles or barks.

► More to explore

Lizard • Reptile

Gems

► see Jewelry and Gems.

Genetics

Genetics is the study of heredity, or how certain features pass from parents to their offspring, or young. Every kind of plant and animal produces young of its own species, or type. The young resemble their parents. But offspring are not usually exactly the same as their parents. For example, their hair color or height may be different. Genetics explains how offspring get some of their parents' features, or traits, but not others.

Genes, Chromosomes, and Reproduction

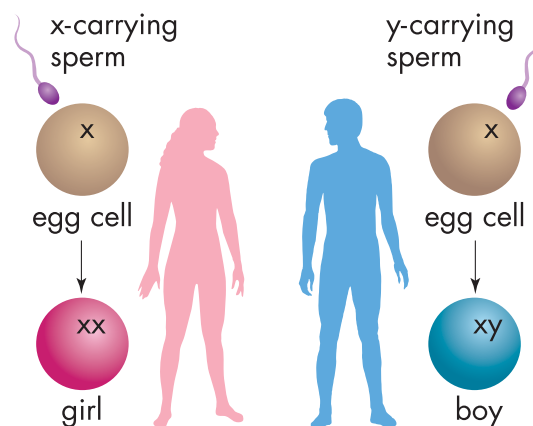
Genes are the basic units of heredity. They carry information about a living thing, including its traits. Genes exist inside the cells that make up living things. Threadlike structures called chromosomes carry the genes. Each chromosome is made up mainly of a substance called deoxyribonucleic acid, or DNA. The genes are short sections of DNA.

In human beings most cells have 23 pairs of chromosomes, or 46 in all. The sex cells—sperm cells and egg cells—each have only one set of 23 chromo-

somes. This is because of the way reproduction works. Every human baby begins as an egg cell from the mother. First, though, a sperm cell from the father must enter the egg. When this happens, the sperm's chromosomes unite with the chromosomes from the egg. Together they form 23 pairs of chromosomes. The egg then begins to divide over and over to grow into a baby. As the baby grows, each of its cells gets a copy of the original chromosomes.

A Boy or a Girl?

One pair of chromosomes in a baby causes it to be a boy or a girl. This pair consists of chromosomes labeled X or Y. Sperm cells have either an X or a Y chromosome. But an egg cell always has an X chromosome. Therefore, when a sperm unites with an egg, the new cell has either one X and one Y chromosome or two X chromosomes. A cell with one X and one Y chromosome produces a boy. A cell with two X chromosomes produces a girl.



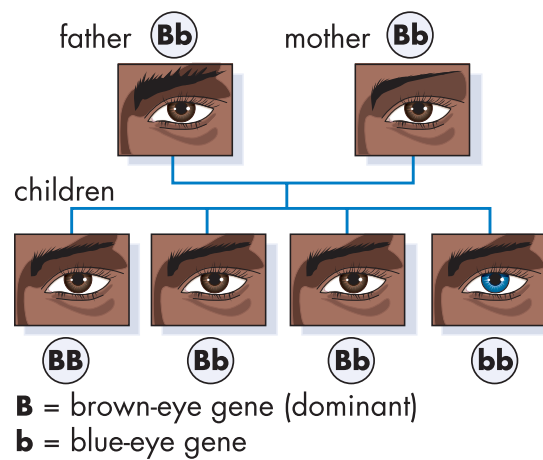
If a sperm with an X chromosome unites with an egg cell, the result is a baby girl. If a sperm carrying a Y chromosome unites with an egg cell, the result is a baby boy.

How Traits Are Inherited

A baby's chromosomes carry a set of genes from the father and another set from the mother. These genes work together to produce the baby's traits. Each gene has a special task—for example, giving color to the baby's eyes.

Some genes are dominant, or stronger than others. A child may get a brown-eye gene from the father and a blue-eye gene from the mother. Because the brown-eye gene is dominant, it takes over the job of coloring the child's eyes. A child has blue eyes only if he or she receives two blue-eye genes, one from each parent.

Children of the same parents can end up with different traits. This is because each parent carries two genes for every task but gives each child only one of these. The father, for example, may have one gene for brown eyes and one gene for blue eyes. His first child may get the brown-eye gene. His second child may get the blue-eye gene.



Every human has two genes to control traits such as eye color. They get one gene from each parent. This is how traits get passed from one generation to the next.



Identical twins can be hard to tell apart.

There are two kinds of twins: identical twins and fraternal twins. Identical twins have exactly the same traits because they have exactly the same genes. Identical twins form from one egg that has united with a sperm. This egg splits in half, and each half grows into a separate baby. Fraternal twins have different sets of genes. This is because they form from two separate eggs that united with two different sperm.

Genetic Problems

Sometimes a gene does not work as it should, or it works in a harmful way. The result may be a defect in a part of the body or a disease. A condition called albinism is an example. It occurs when the gene that controls the body's production of coloring substances does not work properly. People with this condition are born without color in their eyes, hair, or skin. Muscular dystrophy is a disease caused by a defective gene. The disease causes the muscles to weaken over time.

History of Genetics

In the 1850s and 1860s an Austrian monk named Gregor Mendel studied pea plants in his garden. He found that there were rules for how traits passed from one generation of pea plants to the next. The rules are the same for every plant and animal. During his lifetime no one understood how important these findings were.

In 1900 people rediscovered Mendel's work. From then on, the new science of genetics grew rapidly. In 1953 James Watson of the United States and Francis Crick of England discovered the structure of DNA. Their studies helped scientists understand how genes work and how they make copies of themselves.

By the mid-1970s, scientists had learned how to locate, remove, and insert specific genes in DNA. This work is called genetic engineering. By the 1990s scientists could clone animals, or produce animals that have exactly the same DNA as another animal. In 1996 researchers in Scotland produced the first clone of an adult mammal—a sheep. Some scientists worked toward cloning human beings. But others saw this work as dangerous and wrong.

In 2003 a team of researchers finished a project to identify and locate all the genes in all human DNA. The results will help scientists in the study of human biology and medicine.

► More to explore

Chromosome • DNA • Evolution

Genghis Khan

Genghis Khan was a conqueror who brought together the wandering peoples of central Asia more than 800 years ago. He made their lands into the state of Mongolia. Then he took his armies beyond Mongolia. They built up a huge empire. They also killed many people and destroyed many cities.

Genghis Khan was born in about 1162 in northern Mongolia. His name at first was Temüjin. At that time Mongolia was home to a number of related, but separate, peoples called Mongols. Temüjin's father was Yesügei, the chief of one Mongol group. When Temüjin was 9 years old, his father was killed by enemies from another Mongol group, the Tatars. Temüjin then became chief. Though he was young, Temüjin won many followers.



Genghis Khan

Did You Know?

Temüjin was named after an enemy his father had defeated.

Temüjin gradually built up a large army. He used it to conquer neighboring groups, including the Tatars. He unified those groups into a single Mongol nation. In 1206 the people named him Genghis Khan, which means “universal ruler.”

Genghis Khan then set out to conquer other lands. First he invaded northern China. In less than 10 years he and his generals took over most of China. Genghis Khan next conquered the land that now makes up Turkmenistan and Uzbekistan. His generals raided Iran and Russia.

Genghis Khan began his last battle against China in 1226. He died on August 18, 1227. Mongols then controlled land from the China Sea to the European part of Russia. Genghis Khan’s sons and grandsons expanded the Mongol Empire even more.

► More to explore

Mongol Empire • Mongolia

Geography

Geography is a science that deals with Earth’s surface. People who study geography are called geographers. Geographers are interested in Earth’s physical features, such as mountains, deserts, rivers, and oceans. They are also interested in the ways that people affect and are affected by the natural world.

Branches of Geography

Geography can be divided into two branches: physical geography and human geography. Physical geographers



A map is a helpful tool in the study of geography.

observe, measure, and describe Earth’s surface. They study how landforms develop and how they change. They look at how different landforms affect climate. They also study how people change the land through such activities as building cities, digging mines, and clearing forests.

Human geography focuses on where people live, what they do, and how they use the land. Human geographers might study why cities and towns develop in certain places. Others study the cultures of different peoples, including their customs, languages, and religions.

How Geographers Work

Geographers use a number of methods and tools in their work. The simplest method is going out to a place to observe and gather information. This is called fieldwork. Geographers use photographs taken from the air to see things that they cannot see from the ground. They also depend on spacecraft called satellites to take photographs and collect information from far above Earth.

Geographers use computers to help them make sense of the information they receive.

The main tool used by geographers is the map. People who make maps are called cartographers. Geographers use maps to display the information they have gathered. Topographic maps show natural land formations, such as the huge landmasses called continents. Geographers also use maps to show how people have divided the land. Political maps show the boundaries of countries and other divisions.

► More to explore

Climate • Continent • Earth • Map and Globe

Geology

Geology is the study of the physical features and history of Earth. Scientists who work in geology are called geologists.

Geology is an important science for many reasons. It answers questions about how Earth came to have its present shape and form. It is useful for finding important materials in Earth's crust, such as oil. Geology is also helpful for predicting earthquakes and other natural hazards.

Branches of Geology

Geologists work in many different branches of geology. Some geologists study rocks and minerals and how they formed. Some study the structure of Earth and the different forces and

actions inside it. Some study how landforms, such as mountains, on Earth's surface develop and change. Some geologists, called paleontologists, study fossils. (Fossils are the traces of prehistoric plants and animals.) Still other geologists work out how humans can use Earth's resources without harming the environment.

Geologic Time

Most geologists agree that Earth started forming about 4.6 billion years ago. After about 700 million years it had developed a solid crust. Geologists use the words geologic time to describe the vast amount of time that has passed since then. They divide this time into three broad periods, called eons. The two oldest eons are part of what is called Precambrian time. The third eon, which includes present time, is called the Phanerozoic eon. It is divided into three periods called eras—the Paleozoic, Mesozoic, and Cenozoic eras.

Geologists learn about these different periods by studying the many layers of rock in Earth's crust. The deepest layers



Geologists set up equipment at Mount Saint Helens in Washington State.

Did You Know?

Petrology and petrography are branches of geology that deal with the study of rocks.

are the oldest. More recent layers are closer to the surface. Each layer contains unique types of rocks and fossils. These give geologists many clues about Earth's history.

► More to explore

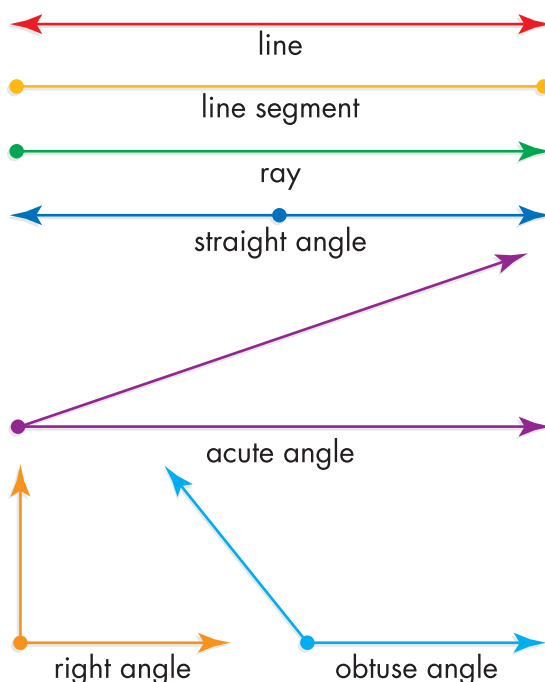
Earth • Fossil • Mineral • Prehistoric Life • Rock

Geometry

Geometry is a kind of mathematics that deals with shapes and figures. Geometry explains how to build or draw shapes, measure them, and compare them. People use geometry in many kinds of work, from building houses and bridges to planning space travel.

Points, Lines, and Angles

Points, lines, and angles are basic terms of geometry. A point is an object that has no length or width. It is usually represented by a dot. A line is an object that



extends without end in both directions. It is usually drawn with arrowheads to show that it goes on forever. A line segment is a part of a line with two end points. A ray is half of a line, with one end point.

Two rays with the same end point form an angle. If the rays are the two halves of a single line, the angle is called a straight angle. A straight angle can be thought of like a book opened flat on a desk. An angle opened half that far is called a right angle.

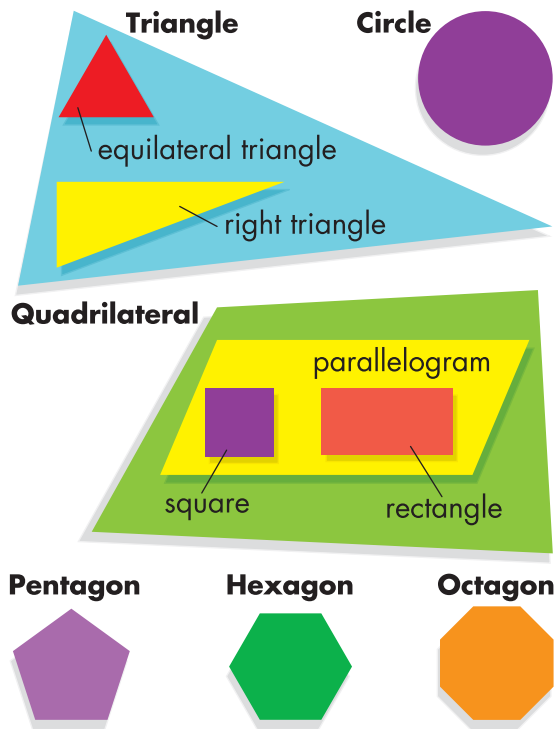
Angles are measured in degrees. A right angle measures 90 degrees. Angles that are smaller than a right angle are called acute. Angles that are larger than a right angle but smaller than a straight angle are called obtuse.

Polygons

A polygon is a closed figure formed by joining together line segments. A polygon with three sides is a triangle. Some kinds of triangles have special names. If all three sides of a triangle are equal, it is an equilateral triangle. A triangle with one right angle is a right triangle.

A polygon with four sides is called a quadrilateral. A rectangle is a quadrilateral with sides that form four right angles. A square is a special kind of rectangle with four sides of equal length.

Polygons with more than four sides are named by combining Greek words for numbers with the letters "-gon." For example, a pentagon is a five-sided fig-



ure. A hexagon has six sides, and an octagon has eight.

Circles

Some geometric shapes have curves instead of straight lines. The most familiar of these shapes is the circle. All the points on the edge of a circle are the same distance from the center. This dis-

tance is called the radius. The diameter is the distance across a circle through the center. It is twice the length of the radius. The length around the outside of the circle is called the circumference.

Solid Figures

Triangles, squares, and circles are flat. Other geometric shapes are solid figures. A cube is a solid figure with flat surfaces. A square box is an example of a cube. A sphere, such as a baseball, is a solid figure with a curved surface. Cones, cylinders, and pyramids are other solid figures.

► More to explore

Mathematics

George III

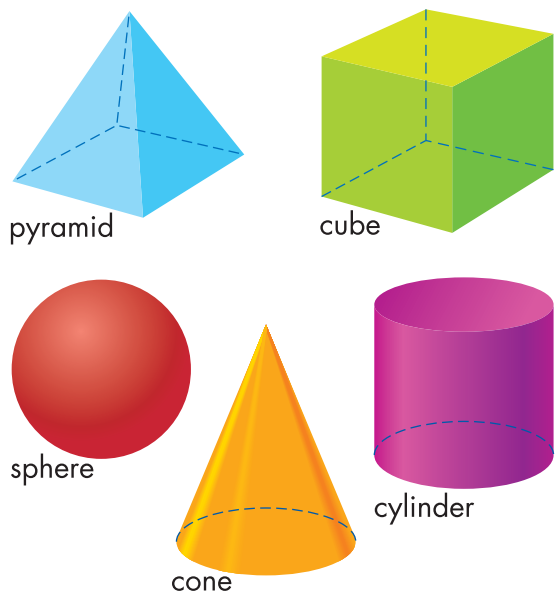
King George III ruled Great Britain during the time of the American Revolution. Problems with the colonies had started before George became king. Even so, people remember George III as the king who lost the American colonies.

Early Life

George William Frederick was born in London, England, on May 24, 1738. He became king when his grandfather, King George II, died in 1760. George III's father had died earlier.

Losing the Colonies

By the time George became king, British monarchs (kings and queens) had lost much of their power to Parliament. Parliament was the group of lawmakers in Britain. Beginning in the 1760s Parlia-



Did You Know?

In 1761 George married Charlotte Sophia of Mecklenburg-Strelitz. They had 15 children.



King George III wears his military uniform in a portrait from about 1800.

ment tried to raise money by taxing the American colonies. The colonists complained that Parliament had no right to tax them because they had no representatives in it.

In 1775 George announced that the colonists were committing treason, the crime of betraying one's country. In the same year, the colonists began fighting for independence. In the U.S. Declaration of Independence, Thomas Jefferson attacked George and called him a tyrant (a cruel, lawless ruler). The colonies won independence from Britain in 1783.

Illness and Death

After the American Revolution, George became very ill. Modern doctors think that he may have suffered from a disease called porphyria. His disease made him hallucinate (see things that were not there). At the time, people called his condition madness.

In 1811 his son Prince George took over the throne as regent, or substitute king. George III died on January 29, 1820. Prince George became King George IV.

► More to explore

American Revolution

Georgetown



Population
(2002 estimate)
137,330

Georgetown is the capital of Guyana, a country on the northern coast of South America. The city lies on the Atlantic Ocean. It is Guyana's only large city.

Georgetown is the country's center of business and manufacturing. It is also the main port. Sugar processing is a major industry in the city.

The British founded Georgetown in 1781. They named the settlement after King George III of England. French and later Dutch settlers took over the town. The British regained control in 1812. In 1831 they made all of Guyana into a British colony. Guyana became an independent country in 1966. Georgetown was made its capital.

► More to explore

Guyana

Georgia

The U.S. state of Georgia is called the Empire State of the South. This nickname reflects Georgia's large size and economic strength. Georgia is as important to the South as New York (the Empire State) is to the Northeast. The state was named for King George II of England. In 1732 the king granted permission for the area to become a colony. It is the only United States state with a name honoring an English king. The capital is Atlanta.

Geography

Georgia is bordered on the south by Florida, on the east by the Atlantic Ocean and South Carolina, on the north by North Carolina and Tennessee, and on the west by Alabama. The Savannah River runs along the eastern edge of the

state and the Chattahoochee River runs along the western edge. The Sea Islands lie off Georgia's Atlantic coast.

The southern part of Georgia is a coastal plain that covers about three fifths of the state. A belt of hills separates the upper edge of this region from a raised flat area that contains most of the state's important cities and farms. The Appalachian Mountains are in the north. In general, Georgia has mild winters and hot and humid summers.

People

The majority of Georgians are of European heritage. Many are of Irish, British, or German descent in particular. African Americans make up about 30 percent of the population.

Almost three quarters of Georgia's people live in urban areas. More than half of the state's entire population lives in and around Atlanta. The city is an important commercial and financial center of the Southeast as well as the region's transportation hub.

Economy

The service sector is the largest part of Georgia's economy. The state's valuable tourism industry provides service jobs in hotels, restaurants, and transportation businesses. Major farm products are broiler chickens, chicken eggs, cotton, and peanuts. Georgia is sometimes called the Peach State because of the



Facts About GEORGIA

Flag



Population

(2000 census),
8,186,453—
rank, 10th state;
(2008 estimate)
9,685,744—
rank, 9th state

Capital

Atlanta

Area

59,425 sq mi
(153,909 sq
km)—rank, 24th
state

Statehood

January 2, 1788

Motto

Wisdom, Justice,
and Moderation

State bird

Brown thrasher



State flower

Cherokee rose



Huge old oak trees line a park in Savannah, Georgia. The Spanish moss hanging from the trees thrives in the humid climate of the state.

large number of peaches it grows. Manufacturing in the state includes the production of textiles, foodstuffs, chemicals, and paper. One Georgia product, the soft drink Coca-Cola, is famous worldwide.

History

When the first Europeans arrived in the area they encountered mostly Cherokee and Creek Indians. In about 1540 the Spanish explorer Hernando de Soto passed through the region. As a result of de Soto's travels, the territory was claimed by Spain. By the second half of the 1600s, however, the British were also in the area. The English colony of Georgia was founded at Savannah in 1733 by General James Oglethorpe.

Georgia was a major battlefield during the American Revolution. After the

revolution it entered the Union in 1788 as the nation's fourth state. Georgia's economy in the 1800s depended heavily on slave labor. The state therefore joined other slave states in forming the Confederacy during the American Civil War. In 1864 Union Army troops under General William T. Sherman left a path of destruction in their "march to the sea" from Atlanta to Savannah. Georgia's economy suffered as a result of the war. Many factories were built during World War II, in the 1940s, and that helped Georgia recover.

One of Georgia's most famous political figures is Jimmy Carter. After serving as the state's governor in the early 1970s, he served a term as U.S. president from 1977 to 1981. Georgia's population grew by more than 25 percent between 1990 and 2000. This increase made Georgia one of the fastest-growing U.S. states during that period.

► More to explore

American Civil War • Atlanta • Carter, Jimmy • Cherokee • Confederate States of America • Creek



A granite carving of Confederate leaders on horseback draws tourists to Stone Mountain Park in northern Georgia.

Georgia, Republic of

The Republic of Georgia is a small country in the Caucasus Mountains of Asia. Georgia's name in the Georgian language is Sakartvelo. The capital is Tbilisi.

Geography

Georgia borders Russia, Azerbaijan, Armenia, and Turkey. The Black Sea lies to the west. The Caucasus Mountains run through the north and the south. Near the Black Sea are fertile lowlands. Most of Georgia has a mild climate.

Plants and Animals

Forests of oak, beech, alder, and fir trees cover more than one third of the land. The mountains are home to goats and Caucasian antelope. Wild boars, deer, brown bears, lynx, wolves, and foxes live in the forests.

People

Ethnic Georgians make up most of the country's population. Armenians, Rus-

sians, and Azerbaijanis are the largest minority groups. Most people follow Georgian Orthodox Christianity or no religion at all. Muslims form a significant religious minority. More than half of the population lives in cities.

Economy

Manufacturing, mining, agriculture, and tourism are all key parts of Georgia's economy. Factories manufacture food products, iron and steel, and transportation equipment. Farms produce mainly potatoes, wheat, and corn. Wine made from local grapes, tea, and citrus fruits are important exports. The Black Sea coast has many tourist resorts.

History

Ancient Romans, the Byzantine Empire, Persians, and Arabs controlled parts of Georgia at different times until the 1100s. Then a united kingdom of Georgia was formed. It lasted until 1220, when Mongols invaded. Ottoman Turks and Persians later ruled the region. Russia took over in the 1800s. In 1921 Georgia became a republic of the Soviet Union.

Georgia declared its independence in 1991. The country soon faced rebellions in several of its regions that continued into the 21st century.

► More to explore

Tbilisi • Union of Soviet Socialist Republics



Facts About GEORGIA



Population
(2006 estimate)
4,651,300

Area
27,086 sq mi
(70,152 sq km)

Capital
Tbilisi

Form of government
Republic

Major cities
Tbilisi, K'ut'aisi,
Bat'umi, Rust'avi,
Sokhumi



Geranium



The geranium is a popular flower-garden plant.

Geraniums are flowering plants that grow in the wild as well as in gardens. There are many different types of geranium. Most have strong fragrances, or smells. Geraniums are common in mild, somewhat moist climates in North America, Europe, and Africa.

Geraniums' flowers may be round, ragged, or frilled. The flowers occur in clusters and come in shades of pink, deep red, violet, and white.

Many of these plants have been developed for their pleasant fragrances. When their leaves are rubbed, they may smell like mint, fruit, flowers, spice, or even chocolate. The leaves tend to be thick, though the leaf shapes vary.

Gerbil

Gerbils are small rodents that are similar to mice and rats. There are almost 100 species, or kinds, of gerbil.

They live in Africa and Asia, mainly in deserts and other dry, sandy areas. For this reason, gerbils are sometimes called sand rats. Some kinds also live in grasslands, farm fields, or forests. The Mongolian gerbil is a popular household pet.

Gerbils have soft fur that is usually pale brown or gray. Their eyes and ears are large. Most gerbils are about 4 to 6 inches (10 to 15 centimeters) long, not including the tail. The tail is usually long and hairy. Many species have long hind legs used for leaping.

Gerbils live in burrows, which are underground holes and tunnels that they dig. Most species come out of their burrows at night to collect food. A few kinds are active during the day. Gerbils mainly eat seeds, roots, nuts, and insects.



A hairy-footed pygmy gerbil rests on the sand of an African desert.

► More to explore

Pet • Rodent

German Measles

► see Rubella.

Germany



A farmhouse stands in the mountains of Germany's Black Forest.

For 45 years after World War II, the European country of Germany was divided into two republics. East Germany was a Communist country, while West Germany was a democracy. The collapse of Communism led to the reunification of Germany in 1990. Germany's capital is Berlin.

Geography

Germany shares borders with Denmark, Poland, the Czech Republic, Austria, Switzerland, France, Luxembourg, Belgium, and The Netherlands. Its northern coasts touch the North and Baltic seas.

The south contains the Bavarian Alps. The vast Black Forest, so called for its thick, dark groves of trees, covers the southwest. Central Germany is hilly and forested. The north is a wide, sandy

plain. Germany's longest river is the Rhine, which runs along the western border. Much of Germany has a temperate climate, with warm summers and cool, overcast winters.

Plants and Animals

Germany's main type of tree is pine, followed by beech and oak. Millions of trees have been damaged by a form of pollution known as acid rain. Germany's animals include deer, wildcats, hares, wild boars, badgers, beavers, and foxes. Birds include thrushes, starlings, sparrows, owls, woodpeckers, herons, and falcons.

People

Almost 90 percent of the population is German. There are small groups of Turks and other Europeans. German is the official language. Most Germans are Christians. The north and east are largely Protestant, while the south and



west have more Roman Catholics. Many people follow no religion. Nearly 90 percent of the population lives in urban areas.

Economy

Services, including health care, education, and tourism, form the largest part of Germany's economy. However, Germany is one of the top industrial countries in the world. It produces automobiles, machinery, chemicals, food products, electrical equipment, metals, and other goods. Germany also has deposits of coal and natural gas.

Although agriculture is a small part of the economy, German farms generally produce more grains, milk, and meat than the country needs. One major crop is hops, which is used in Germany's famous beer industry.

History

During ancient and medieval times hundreds of Germanic, Celtic, and Slavic tribes lived in what is now Germany. The Franks unified the tribes in the 500s. After the death of the Frankish king Charlemagne in 814, the eastern part of his empire became Germany. Germany was made up of loosely connected states. Many kings of Germany also ruled the Holy Roman Empire, which covered much of central Europe.

In the 1500s the German priest Martin Luther led the Reformation. The movement criticized Roman Catholicism and led to the formation of Protestant forms of Christianity.



People sit in an outdoor restaurant in Munich. The city is one of the largest in Germany. It attracts many tourists.

The German Empire

The Holy Roman Empire weakened in the mid-1600s, and the German state of Prussia rose in importance. In the late 1800s Prussia united many of Germany's states to form the German Empire, or the Second Reich. Germany became Europe's leading power. It also acquired colonies in Africa, Asia, and the Pacific Ocean.

During World War I (1914–18) Germany and its allies, Austria-Hungary and Turkey, battled Great Britain, France, Russia, Italy, and the United States. The war ended with a disastrous defeat for the German Empire. Germany lost land to surrounding countries. It also lost its colonies.

The Third Reich

After World War I a democratic government known as the Weimar Republic took power in Germany. It collapsed, however, as the country struggled with a poor economy. Adolf Hitler and his Nazi Party gained control in 1933. Hit-

Facts About GERMANY



Population
(2008 estimate)
82,143,000

Area
137,847 sq mi
(357,023 sq km)

Capital
Berlin

Form of government
Republic

Major cities
Berlin, Hamburg,
Munich, Cologne,
Frankfurt am
Main

ler wanted to create a new German Empire, called the Third Reich.

Hitler's plans led to World War II. Germany, allied with Italy and Japan, formed the Axis Powers. They fought the Allies—Britain, the Soviet Union, and the United States. By the time the Allies defeated the Axis in 1945, the Nazis had killed millions of people, including about 6 million Jews, in a massacre called the Holocaust.

Division of Germany

Following World War II the Allies divided Germany into four zones. The United States, Britain, France, and the Soviet Union each controlled a zone. In 1949 the United States, Britain, and France merged their zones to create the Federal Republic of Germany, or West Germany. West Germany had a democratic government.

The Soviet zone became the German Democratic Republic, or East Germany.

Like the Soviet Union, East Germany had a Communist government. Within East Germany was the city of Berlin, which was also divided into eastern and western sections. Millions of East Germans fled to West Germany through Berlin. In 1961 East Germany built the Berlin Wall, which kept western Berlin separate from the rest of East Germany.

Reunification

In 1989 the Communist government of East Germany collapsed. People began tearing down the Berlin Wall. Tens of thousands of East Germans crossed into West Berlin to celebrate their new freedom. East and West Germany were officially reunited in 1990. The country then began modernizing eastern Germany's economy. Germany also joined the European Union.

► More to explore

Berlin • Communism • European Union • Holy Roman Empire • Nazi Party • Reformation



TIMELINE

The Franks unify the tribes of ancient Germany.

500s

The German Empire is formed.

1871

Martin Luther begins the Reformation.

1517

Germany is defeated in World War II.

1945

The Nazis take power.

1933

Germany is reunited.

1990

Germany splits into West and East Germany.

1949

Did You Know?

Geronimo's Apache name was Goyathlay, which means "one who yawns." The Mexicans were the first to call him Geronimo.

Geronimo

The legendary warrior Geronimo was a leader of the Chiricahua band of the Apache people. The Apache lived in northern Mexico and what is now the southwestern United States. Geronimo spent most of his life fighting Mexican and U.S. settlers and soldiers who wanted to take the tribe's land.

Geronimo was born in June 1829 in a part of southeastern Arizona that was then part of Mexico. At the age of 17 he became a member of his tribe's warrior council and took part in fights between the Apache and the Mexicans. In 1858 the Mexicans killed his mother, wife, and children. Wanting revenge, Geronimo fought even more fiercely. His skill and courage in battle made him an Apache leader.



Geronimo

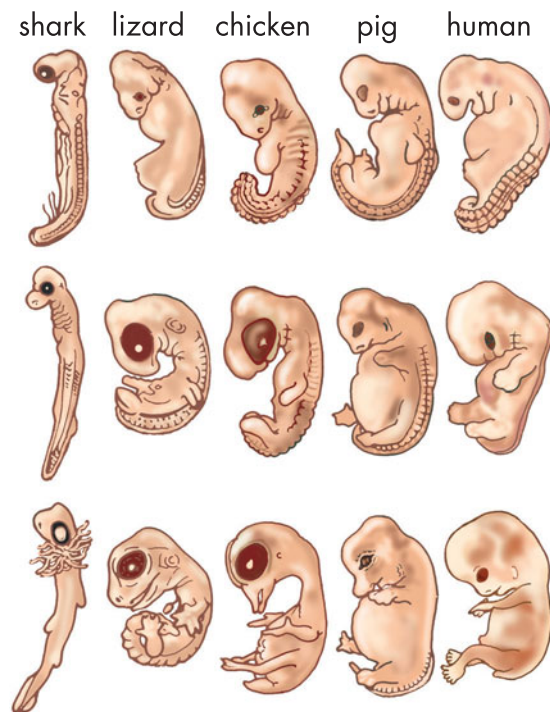
In 1874 the U.S. government forced Geronimo and some 4,000 other Apache to move to a reservation in Arizona. There they were often short of food and denied their traditional customs. Geronimo and his followers left the reservation and led violent raids against settlers in Arizona for more than 10 years. He surrendered in 1886, and he and his followers were sent to Florida as prisoners and forced to do hard labor. In 1894 Geronimo was moved to Fort Sill in Oklahoma Territory. He died there on February 17, 1909.

► **More to explore**
Apache

Gestation

Gestation is the period of time that a mammal carries her offspring, or babies, inside her body before giving birth. The length of gestation is different for each type of mammal. Larger animals usually have longer gestations than smaller animals. Human gestation, or pregnancy, lasts about nine months. An elephant's gestation lasts about 22 months. In squirrels, gestation lasts only about six weeks.

Before birth, mammals grow inside an organ called the uterus in the mother's belly. The uterus is a part of the body's reproductive system. A structure called a placenta usually connects the developing baby to the uterus. The placenta brings nutrients from the mother's body to the developing baby, or fetus.



All animals go through a period of development before they are born. For mammals this takes place inside the mother's body during gestation. For other animals this may take place inside an egg. The developing animal is called an embryo. The embryos of many animals look alike in the earliest stages. But they soon start to develop into their different forms.

Gestation in Marsupials

Marsupials are mammals whose babies usually develop in a pouch after birth. Some examples are kangaroos, koalas, and opossums. Marsupials do not have true placentas. For this reason, marsupial gestation is relatively short. Even the largest type of kangaroo is born after about 40 days.

Marsupial babies are born tiny and undeveloped. Right after they are born they crawl inside a pouchlike flap of skin at the front of their mother's body. There they continue to develop until they are ready to leave the pouch.

Gestation in Placentals

Placentals are mammals that have placentas during gestation. Humans, cats, dogs, deer, whales, and most other mammals are placentals. The gestation of placentals is usually longer than the gestation of marsupials. This means that the babies of placentals are born more developed than marsupial babies.

However, the babies of different placentals are born at different levels of development. Placentals also have different lengths of gestation. Horses have a gestation of about 11 months. Their babies can walk hours after birth. Chimpanzees have a gestation of about eight months. Their babies are helpless for a few months after birth.

Human Gestation

Human gestation, or pregnancy, is divided into three periods called trimesters. Each lasts about three months.

In the first trimester, the fetus develops a heartbeat and the beginnings of all the other body parts. The fetus also grows an umbilical cord, which connects it to the placenta. At three months, the fetus weighs less than 1 ounce (28 grams). In the second trimester, the fetus starts to move around in the uterus. At six months, it weighs up to 2 pounds (900 grams). In the third trimester, the baby continues to grow bigger and stronger. By the time of birth, the baby weighs about 7.5 pounds (3.5 kilograms).

► More to explore

Mammal • Reproductive System

Did You Know?

The Virginia opossum has the shortest known gestation—about 12 days.



Ghana

Ghana is a country in western Africa. In 1957 it became the first African colony south of the Sahara Desert to win independence. Ghana then led the way in establishing industries and a modern educational system. It also produced important leaders, including Kofi Annan, a secretary-general of the United Nations. Ghana's capital and largest city is Accra.

Geography

Ghana is bordered by Côte d'Ivoire on the west, Burkina Faso on the northwest and north, and Togo on the east. On the south Ghana has a coastline on the Gulf of Guinea, which is part of the Atlantic Ocean. Ghana's climate is warm year-round, with dry and rainy seasons.

Ghana's land is mainly flat. The southwest, northwest, and north contain higher plateaus and some hills and valleys. Low mountain peaks rise in the



Women paint the walls of a village in Ghana.

east. The Black Volta and White Volta rivers flow southward from Burkina Faso. The two rivers feed Lake Volta, one of the largest artificial lakes in the world. It was formed behind the Akosombo Dam, which produces electricity for Ghana.

Plants and Animals

Tall grasses and scattered trees cover the northern two thirds of the country. Forests cover most of the southern third. Ghana's trees include the silk cotton tree, the wawa tree, and the African mahogany.

Ghana's large mammals include lions, leopards, hyenas, antelope, elephants, buffalo, wild hogs, chimpanzees, and monkeys. Crocodiles and hippopotamuses live in the rivers. Ghana also has numerous birds, including parrots, hornbills, and kingfishers. Among its snakes are cobras, pythons, puff adders, and horned adders.



People

The people of Ghana belong to one broad group divided into about 75 different tribes. The largest tribe is the Akan. Other large tribes include the Mole-Dagbani, the Ewe, the Ga-Adangme, and the Gurma. English is the official language, but each tribe has its own language. More than half of the people are Christian. Many others practice traditional religions or Islam.

Economy

Ghana's economy is based on farming and mining. More than half of its workers are involved in agriculture. The country's main exports are gold and cocoa. Other crops include cassava, yams, bananas, corn, sorghum, rice, and millet. Ghana also mines diamonds, manganese, and bauxite, which is used to make aluminum. Logging, fishing, and manufacturing are also important.

History

Most of Ghana's present ethnic groups lived in the region when Portuguese explorers arrived in 1471. Because of its

gold mines, the area became known as the Gold Coast. In 1482 the Portuguese began building forts on the coast as headquarters for the gold trade. In the 1600s traders from other European countries set up their own forts.

Soon the Europeans began trading slaves as well as gold. In the 1700s the Ashanti, an Akan people, developed a kingdom in the south. They supplied slaves to the Europeans.

The British defeated the Ashanti and made the Gold Coast a colony in 1874. Beginning in 1949 Kwame Nkrumah led a movement for independence. The people held protests and set up their own government. In 1957 Britain gave Ghana its independence. Ghana was a model for other colonies to follow in their independence movements.

Independent Ghana was ruled at first by a prime minister. In 1960 the country became a republic with a president. Nkrumah was elected the first president. He took away some freedoms for groups that opposed his rule. In addition, the country became poorer.

The army and the police seized control of Ghana in 1966. Many different groups tried to take control for the next 26 years. In 1981 one government banned political parties. In 1992 the country gained a new constitution that restored democracy and political parties.

► More to explore

Accra • Ashanti

Facts About GHANA



Population
(2008 estimate)
23,383,000

Area
92,098 sq mi
(238,533 sq km)

Capital
Accra

Form of government
Republic

Major cities
Accra, Kumasi,
Tamale, Tema,
Obuasi



Local fishermen in Ghana use a small boat to search for fish.

Ghana Empire



Ghana was a powerful trading empire in western Africa. The empire was most active from the 700s to the 1200s. It grew rich and strong by controlling large amounts of gold. The empire's lands are now partly in Mauritania and partly in Mali. It was not related to the current country called the Republic of Ghana.

Ghana was founded by the Soninke people. To their north lived Arab and Berber peoples who had salt and wanted gold. To their south lived African tribes who had gold on their lands and wanted salt. The Soninke handled trade between the two groups.

By 800 the Soninke had become highly organized. They conquered other tribes to form a mighty empire. They called their empire Wagadu, but other people called it Ghana because *ghana* was the king's title.

Several times in its history Ghana moved its capital. The last capital city was Kumbi. It was located about 200 miles (320 kilometers) north of modern Bamako, Mali. At its peak, before 1240, Kumbi was western Africa's largest city, with more than 15,000 people.

In 1076 a northwestern African Muslim group called the Almoravids took control of Kumbi. The Almoravids ruled for only a short time but did lasting damage to the empire. They disrupted trade routes and destroyed croplands with their flocks of grazing animals.

In 1203 the various groups living under Ghana's rule began to break away. One of these, the Susu, occupied Kumbi. In 1240 a chief named Sundiata destroyed the city. Sundiata then incorporated what was left of the Ghana Empire into his new Mali Empire.

► More to explore

Mali Empire

Giant Sequoia

The giant sequoia is a huge evergreen tree. It grows only on the western slopes of the Sierra Nevada mountains in the U.S. state of California. Its scientific name is *Sequoiadendron giganteum*. It is related to the redwood.

The giant sequoia is so large that it is sometimes called simply the big tree. Some giant sequoias are more than 280 feet (85 meters) tall. They have huge trunks that are sometimes more than 100 feet (30 meters) around at the bot-



Giant sequoias tower above tourists in Sequoia National Park in California.

tom. The reddish brown bark can grow to more than 12 inches (30 centimeters) thick. Giant sequoias usually have branches only near the top because the lower branches fall away as the tree grows. The leaves are blue-green.

The giant sequoia is a conifer, which means that it produces cones that hold its seeds. At 3.5 inches (9 centimeters) long, the cones are tiny compared to the tree.

Giant sequoias can live to a very old age. Some are more than 3,500 years old. The wood is rich in chemicals that keep away insect pests and prevent rotting. The thick bark does not burn easily and helps to protect the giant sequoia from fire.

► More to explore

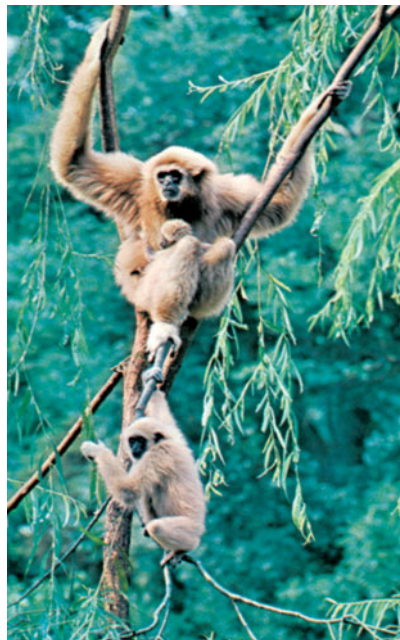
Conifer • Redwood • Tree

Gibbon

Gibbons are small apes of the rain forests of southeastern Asia. They spend most of their time in trees. They use their long arms to swing quickly from branch to branch. A gibbon can travel an amazing 10 feet (3 meters) in a single swing. On the ground, gibbons walk upright on two legs.

All apes belong to the group of mammals called primates, along with monkeys, humans, and some other animals. Gorillas, orangutans, chimpanzees, and bonobos are called great apes. Gibbons are called lesser apes. They are smaller and less intelligent than the other apes.

There are 14 species, or types, of gibbon. They vary in length from about 16 to 35 inches (40 to 90 centimeters). The



Gibbons live high up near the tops of the trees in rain forests. They have long, thin hands and feet that help them climb and hold onto branches.

siamang is the largest of the gibbons. Like all apes, gibbons lack tails. But gibbons have longer arms and thicker hair than the great apes do. Most gibbons are mainly shades of cream, brown, black, or gray. Some kinds have white hands and feet. In many species the males and females are different colors.

Gibbons eat mostly fruit. They may also eat leaves, insects, birds' eggs, and young birds.

Gibbons usually have only one mate during their lives. They live in small family groups. These families defend their home range with loud calls. These sounds warn other gibbons to stay away.

► More to explore

Ape • Primate • Rain Forest

Gibraltar



As a fortress and colony, Gibraltar has been a symbol of British military strength since the 1700s. Commonly referred to as the Rock, it is the site of a British air and naval base that guards the Strait of Gibraltar. This important waterway between Spain and Africa con-

nects the Mediterranean Sea to the east with the Atlantic Ocean to the west.

Gibraltar is a peninsula that is about 3 miles (5 kilometers) long and less than a mile wide. It consists of a limestone mountain that rises sharply to a height of 1,396 feet (426 meters). A low, sandy strip of land connects it to Spain, 1 mile (1.6 kilometers) to the north. The Strait of Gibraltar is to the south. Across the strait is the African country of Morocco.

Two thirds of the residents of Gibraltar are Gibraltarians—people born in Gibraltar before 1925 and their descendants. Most Gibraltarians are of mixed British, Italian, Spanish, Maltese, and Portuguese descent. Many of the rest of the people are British.

Shipping, banking, and tourism are major sources of income in Gibraltar. The British military post and naval shipyard are also important to the economy. The leading manufacturing industries are shipbuilding and ship repair.

People have lived on Gibraltar since prehistoric times. Muslims held Gibraltar from 711 to 1462, when they lost it to Spain. In 1501 Gibraltar became part of Spain. Captured by the British in 1704, it became a British colony in 1830. It was an important port in World Wars I and II. Control of the territory has remained a source of dispute between Great Britain and Spain.

► More to explore

Spain • United Kingdom

Ginkgo



Ginkgo leaves turn golden yellow in autumn.

More than 200 million years ago several types of ginkgo trees grew throughout the world. Today only one type of ginkgo still exists. Its scientific name is *Ginkgo biloba*.

The ginkgo trees of today came from China, where they grew in the wild. People in ancient China and Japan also grew them in the gardens of temples and palaces. Today ginkgos grow in cities, parks, and gardens on every continent but Antarctica. Some plant experts believe that groups of ginkgos no longer grow in the wild.

Ginkgos are very hardy trees. They resist damage from insects and fungi, plantlike living things that sometimes grow on trees. City pollution also does not harm ginkgos.

Ginkgo trees have the shape of a pyramid. They sometimes grow to be 100

feet (30 meters) tall. Their trunks may measure as much as 8 feet (2.5 meters) across. Ginkgo leaves are a dull gray-green color. They have a tough, almost rubbery texture. They are shaped like fans with a split in the middle.

Ginkgo trees are either male or female. Winds carry pollen from male trees to female trees. Female trees then produce large seeds. The seeds are round, silvery nuts surrounded by a smelly, yellowish covering.

People grow ginkgo trees for their beauty and the shade they provide. Roasted ginkgo nuts are considered special foods in China and Japan. Ginkgo leaves are used in some medicines.

► More to explore

Seed • Tree

Giraffe

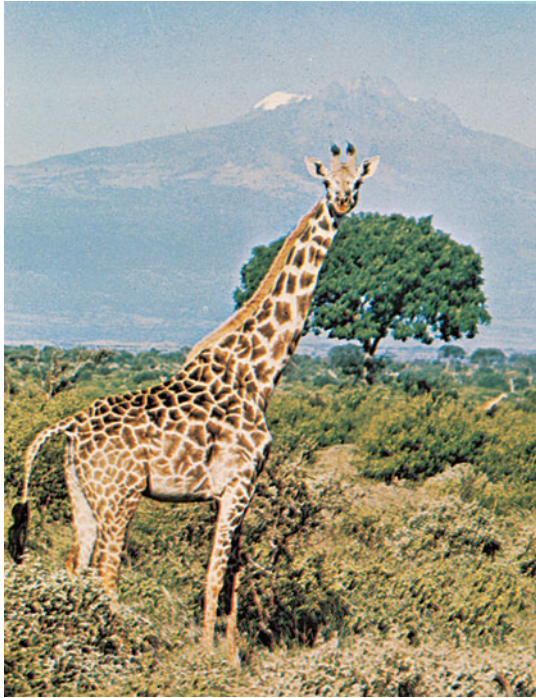
The giraffe is the tallest living animal. It reaches a height of 18 feet (5.5 meters) or more. Giraffes live on the plains of eastern Africa. The scientific name of the giraffe is *Giraffa camelopardalis*.

Giraffes have a short body, but their legs and neck are very long. The coat is light brown with reddish brown spots. Many giraffes have two short horns between the ears. Giraffes have large nostrils and a good sense of smell. Their tongues are over 18 inches (45 centimeters) long.

Giraffes are plant eaters. They can reach leaves at the top of trees. But they do not eat grass. It is very hard for them to

Did You Know?

The ginkgo is also known as the maiden-hair tree.



The giraffe is built for reaching the treetops.

reach the ground because the neck is stiff. To drink, a giraffe must spread its legs far apart to reach down.

Giraffes live in herds of up to 20 animals. They use their good eyesight to watch for danger. Lions are the giraffe's main enemy. Giraffes try to gallop away from enemies, but they will fight if necessary. They can run more than 30 miles (48 kilometers) an hour.

A female giraffe gives birth to one calf at a time. The newborn can usually follow its mother around within hours. Giraffes live about 20 to 25 years.

Giraffes are still common in eastern Africa. They are protected there inside national parks. In other places, however, hunting has reduced the number of giraffes. People use giraffe skin to make leather.

Girl Scouts and Girl Guides

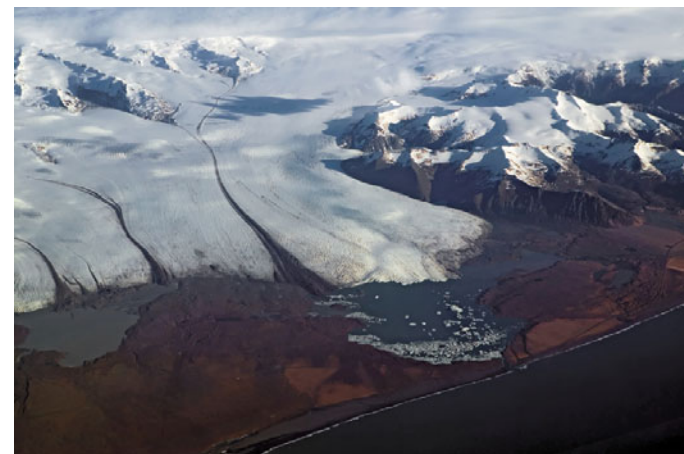
► see Scouting.

Glacier

A glacier is a large area of thick ice that remains frozen from one year to the next. Glaciers also slowly flow over the land. Thousands of years ago, large parts of the world were covered with glaciers. At times glaciers covered about 30 percent of Earth's surface. At other times there were fewer glaciers than there are today.

Where Glaciers Are Found

Glaciers exist all over the world today. Most of Greenland is covered by thick sheets of glacier ice, as is Antarctica. There are smaller glaciers in the Rocky Mountains of North America, in the European Alps, in the Andes of South America, and even at mountainous points along the equator.



Glaciers cover about 10 percent of Earth's surface.

How Glaciers Form

Glaciers are formed when snow is packed down into ice. Snow crystals accumulate year by year in areas where the temperatures never become high enough to completely melt the snow and ice. When a large amount has accumulated, the snow is under great pressure from the weight. Eventually the snow becomes packed so tightly together that it turns into ice. It usually takes several years for glacier ice to form. In some cases, however, it may take thousands of years.

Effect on the Environment

Glacier ice today stores about three fourths of all the freshwater in the world. Many people believe that if temperatures around the world increased enough that the glaciers melted, sea levels would increase greatly and flood coastal areas. The world's sea levels are already rising about 0.08 inch (2 millimeters) every year. Scientists believe that melting glaciers cause much of this rise.

Despite this activity, it is unclear how much sea levels might eventually rise because of melting glaciers. Some scientists believe that if temperatures on Earth were to rise dramatically, the warming of the air would cause moisture to form in the atmosphere. This moisture would fall as rain and snow, which could balance out any melting that might occur.

► **More to explore**
Antarctica • Greenland

Gladiator

Gladiators were professional fighters in ancient Rome. Their fierce battles—sometimes to the death—thrilled stadium crowds.

Gladiators were usually slaves and criminals. They trained at special schools. They used many kinds of weapons. Some fought with swords, while others used knives or tridents (three-pointed spears). Some had to battle wild animals.

The shows were held in huge arenas called amphitheaters. A fight usually went on until one gladiator was wounded. The crowd then decided whether the loser had fought bravely enough to be allowed to live.

The winner received palm branches and sometimes also money. A champion might be allowed to retire. Sometimes he gained his freedom.



A gladiator spears a leopard in a Roman artwork.

The first known gladiator show in Rome took place in 264 BC. Some later shows went on for weeks and used thousands of gladiators. Shows were held throughout the Roman Empire.

Gladiator shows gradually became unpopular. Constantine I outlawed them in AD 325. But they may have continued for at least 100 years after that.

► More to explore

Rome, Ancient

Glass



Onion-shaped pieces of blown glass float on a pond. They are part of an art display.

Glass is a useful and unique material. It usually lets light shine through, but it blocks liquids and air. Glass is easily breakable, but it can also be made very strong. And glass can be formed into all kinds of shapes.

Glass feels hard like a solid, but it is built more like a liquid. The tiny particles that make up true solids are arranged in a specific order. The particles in glass are arranged randomly, as in a liquid.

How Glass Is Made

The main ingredient for glass is pure silica, or sand. It takes very high temperatures to make glass from sand. By adding certain chemicals to the silica, the process needs much less heat. Chemicals can also make the glass stronger or add colors to it.

The silica and chemicals are called the batch. To begin, glassmakers add to the batch some glass that has already been made. This scrap glass helps the silica to melt.

Once the batch is melted, glassmakers remove any bubbles or streaks. Then the melted glass can be molded into shapes or rolled into sheets and allowed to harden.

Modern machines can quickly and easily create huge numbers of glass items. But artists still create unique items through a method called glassblowing. Glassblowers blow air through a tube into melted glass to create different shapes.

Uses

People use glass in countless ways. Glass windows allow light to pass through but keep out cold and rain. Electric light-bulbs are made of glass. Glass containers store all kinds of things, including food, drinks, and chemicals. Glass mirrors



Glassblowing was invented more than 2,000 years ago. Today most people who blow glass are artists.

reflect images. Lenses made of high-quality glass are used in microscopes and telescopes. Fiber-optic cables are bundles of tiny glass threads that carry information in the form of light. These cables are used to link telephones and computers over long distances.

History

The oldest known glass is more than 4,000 years old. Ancient Egyptians made glass beads and jars in about 2500 BC. Glassblowing probably began in Syria more than 2,000 years ago.

Glassmaking became important in Europe after the 1100s. Many European churches were decorated with stained-glass windows. In stained-glass windows, strips of lead hold pieces of colored glass together.

People in the American colonies started making glass in 1608. In 1825 a company in Pittsburgh, Pennsylvania, invented a glass-pressing machine. The

machine helped to make glass in huge amounts.

In the 1900s glass became easier to make, less expensive, and stronger. Glass windows and containers became everyday features of most homes.

► More to explore

Fiber Optics • Lens • Mirror • Sand

Glider

A glider is an aircraft that soars through the air without the help of a motor. Some gliders look very much like airplanes. They have wings, a tail, a cockpit, an instrument panel, and a fuselage, or body. Some are even called sailplanes.

How Gliders Work

Gliders and airplanes with engines work in a similar way. A pilot controls both kinds of aircraft. Unlike airplanes with engines, however, gliders must be towed, or pulled, into the air to begin their flight. People may tow gliders using an automobile or a winch, which is a reel attached to a motor. A rope called a tow-



Sailplanes are the most advanced type of glider. They can soar for hours.

line connects the glider to the automobile or winch. The automobile or winch pulls the glider forward along the ground and into the wind. As the glider's speed increases, air flows over its wings at a faster and faster rate. This produces an upward force, called lift, on the wings. When this force becomes greater than the downward force of gravity, the glider can stay in the air. Then the glider pilot releases the towline. An airplane with an engine may also tow a glider into the air.

Did You Know?

A glider's wings are long and narrow. The shape helps the glider soar through the air.

Once the glider is flying, its pilot uses controls to move it higher, lower, and to the right or left. Glider pilots search for upward-moving air currents, called updrafts. The updrafts push the glider higher into the sky.

History

Gliders were developed in the late 1800s in Germany. By experimenting with gliders the Wright brothers were able to develop the first airplane in the early 1900s. Gliders were later used in warfare. For example, gliders carried many soldiers into enemy lands during World War II. Today gliders are used mostly for sport.

► More to explore

Airplane

Global Warming

The average surface temperature on Earth is slowly increasing. This trend is known as global warming.



Factories that burn fossil fuels help to cause global warming.

Greenhouse Effect

To understand global warming, it helps to understand the greenhouse effect. A greenhouse is a glass house where plants grow. Glass lets light in and keeps heat from escaping. This trapped heat keeps the plants warm even when it is cold outside.

Likewise, Earth's atmosphere traps energy from the sun. Carbon dioxide and other gases—called greenhouse gases—in the air do this trapping. Without these gases too much heat would go back into space, and living things could not survive. However, as more greenhouse gases get into the air, they also trap more heat. This leads to global warming.

Causes

For much of Earth's history, greenhouse gases were not a problem. This situation changed as people came to depend on fossil fuels (oil, gas, and coal). People burn fossil fuels to power factories, run cars, produce electricity, and heat

houses. As fossil fuels burn, they release carbon dioxide into the atmosphere.

Also, people have cut down many forests. Trees use carbon dioxide when they make their own food. Fewer trees mean that less carbon dioxide is being taken out of the atmosphere.

Reasons for Concern

Scientists cannot tell how warm Earth may get over time. Some guess an increase between 2.5° F and 10.4° F (1.4° C and 5.8° C) by the year 2100. The warmer weather could harm living things. It also could cause polar ice caps to melt. This would cause sea levels to rise. Plants, animals, and buildings along coastlines would be in danger.

Stopping Global Warming

Global warming is a worldwide concern. Governments are trying to find ways to limit the amount of greenhouse gases put into the air. Individual people can help by driving less. They also can save energy by turning off unneeded lights and other electrical devices.

► More to explore

Atmosphere • Fossil Fuel • Greenhouse Effect

Globe

► see Map and Globe.

Goat

Goats are horned mammals that can be either wild or tame. People keep goats



People cut the long hair of Angora goats to use as a fiber called mohair. Mohair can be made into sweaters, scarves, and other types of clothing.

for their meat, milk, and wool. They are hardy animals that can live on coarse, thin grass. Goats can be raised on land that does not have enough plants for cows or sheep.

Goats are closely related to sheep, but they are not as solidly built. A domestic (tame) goat usually weighs about 100 to 120 pounds (45 to 54 kilograms). Goats also have straighter hair and a shorter tail than sheep. Both male and female goats may have horns. Some male wild goats grow horns up to 4 feet (1.2 meters) long. Most males also grow beards.

Goats eat grass and shrubs. A goat digests its food by swallowing and then regurgitating it, or bringing it back up from the stomach. The goat then chews it again in a form called cud.

Wild goats are animals of the mountains. They live in rugged parts of Europe, Asia, and northern Africa. They

can climb on cliffs and rocks without losing their footing. Most wild goats live in herds of 5 to 20 animals. Males and females usually come together only to mate.

Goats have been kept by people for about 9,000 years. People eat goat meat and drink goat milk. They also use goat milk to make cheese. Angora and cashmere goats are prized for their wool, which is made into clothing and rugs. Goatskins are used to make gloves, shoes, and other leather items.

► More to explore

Mammal • Sheep

Gobi



The Gobi is a vast desert in central Asia. It covers parts of Mongolia and China. The word *gobi* means “waterless place” in the Mongolian language.

The Gobi is surrounded by mountain ranges. Its land is mostly rocky plains with some hills. Summer in the Gobi is very hot, and winter is cold and harsh. Temperatures range from -40°F



The Gobi is bordered by several mountain ranges, including the Altai Mountains.

(-40°C) in January to 113°F (45°C) in July. The Gobi gets very little rain or snow. There are few rivers that flow year-round. Most of the water is underground.

Because of the dry climate, few plants grow in the Gobi. Rough grasses and low bushes are most common. Animals of the Gobi include wild camels and horses, gazelles, and antelope. There are also rodents, such as gophers.

The Gobi has a small population spread out over its huge area. Most of the people are Mongols, but some are Chinese. The people are mostly nomads who raise sheep, goats, cattle, and camels. They move around the desert with their animals.

► More to explore

Desert • Mongolia • Nomad

Gold Coast

► see Ghana.

Goldfish

The goldfish is a popular fish to keep as a pet in aquariums and ponds. It also lives in the wild, in rivers and lakes. The goldfish is a member of the carp family. Its scientific name is *Carassius auratus*.

Goldfish are naturally greenish brown or gray. But about 1,000 years ago people in China began breeding goldfish to create more colorful varieties. There are now more than 125 breeds of goldfish found throughout the world. They can be gold, red, orange, white, black, or a combination of colors.

Some breeds of goldfish have unusual features. For example, the celestial goldfish has eyes that jut out and always look upward. The lionhead has a growth on its head that looks something like a lion's mane.

Wild goldfish eat mostly plants and small animals. They grow to a size suitable for their environment. For example, aquarium goldfish are only 2 to 4 inches

(5 to 10 centimeters) long. But goldfish living in bigger spaces can reach a length of 2 feet (0.6 meter).

Goldfish breed during spring or summer. A female goldfish can produce thousands of eggs during each breeding season. The eggs usually hatch in less than a week. Goldfish have an average life span of 7 to 10 years. Some live as long as 25 years.

► More to explore

Carp • Fish • Pet

Gold Rush

The metal gold has been considered valuable for centuries. At times people have discovered places where gold can be dug out of the ground. This has created a gold rush, when many other people go to the same place hoping to find gold of their own.

The biggest North American gold rush took place in the U.S. state of California. It started in 1848 when a carpenter found gold at Sutter's Mill, near the Sacramento River. By 1849 there were 80,000 gold seekers—called “forty-niners”—in the area.

A gold rush in 1851 brought people to the Ballarat and Bendigo regions of Victoria, Australia. People found nuggets, or chunks, of gold as heavy as 200 pounds (75 kilograms).

Another major gold strike took place along the Klondike River in the Yukon Territory of Canada. Despite cold

Did You Know?

U.S. author Jack London set his stories *Call of the Wild* and *White Fang* during the Klondike gold rush.



Aquarium goldfish eat flake or pellet food. They also like to eat plants.



During the 1890s some people in Alaska looked for bits of gold in panfuls of river gravel. This was called panning for gold.

weather, about 30,000 people came between 1896 and 1899. Some gold was found in Alaska also.

In 1886 a diamond digger discovered gold in the Transvaal region of South Africa. Today, South Africa is the world's largest producer of gold.

Gold is often discovered in isolated areas with few people or towns. But because so many people are attracted by the gold, several major cities have grown up around such areas. These include San Francisco, California; Melbourne, Australia; and Johannesburg, South Africa.

► More to explore

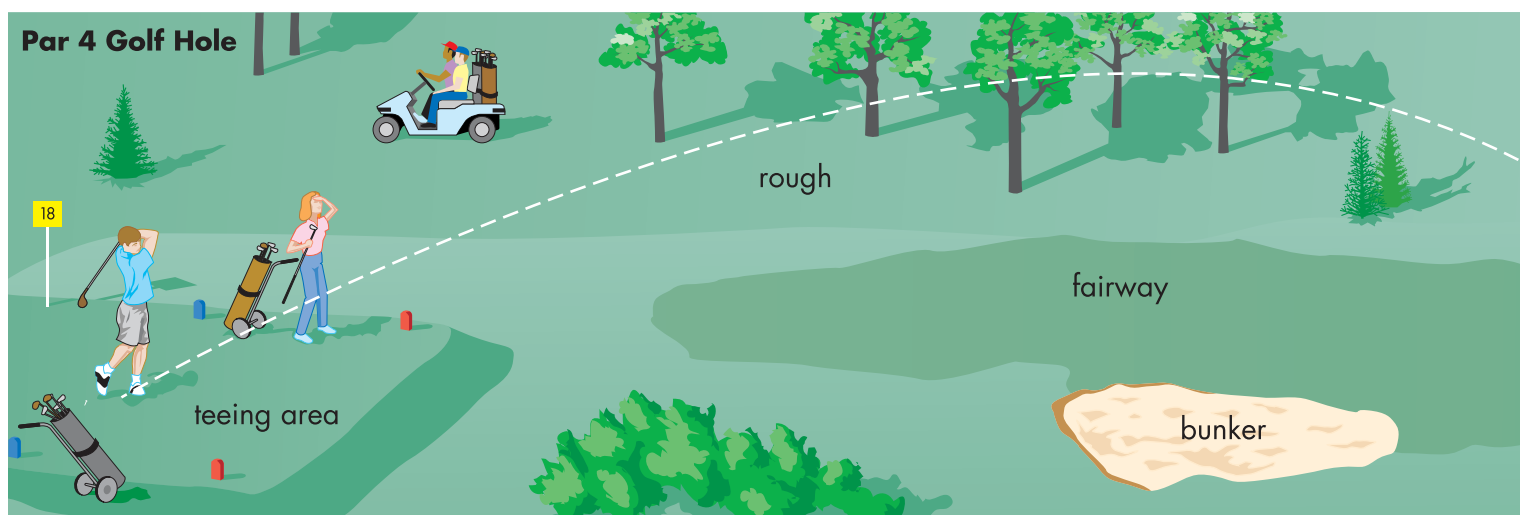
Metal

Golf

Golf is an outdoor sport played with clubs and a small ball. It is played on a large, grassy area called a course. Golfers hit the ball into a series of holes on the course. The goal is to finish playing the course with as few hits, or strokes, as possible.

Playing Area and Equipment

A standard golf course has 18 holes. The playing area for each hole varies in length from about 100 to 600 yards (90 to 550 meters). Play begins at a spot called the teeing area. It is a flat, rectangular patch of short grass. In front of the





U.S. golfer Michelle Wie putts during a tournament in 2005.

teeing area is a mowed strip called the fairway. The fairway is the longest section of each hole. The fairway extends to an area of closely mowed grass called the green. Each green has a hole, called the cup, that measures about 4 inches (10 centimeters) across.

Many golf holes have features that make play more difficult. These include obstacles called hazards. One type of

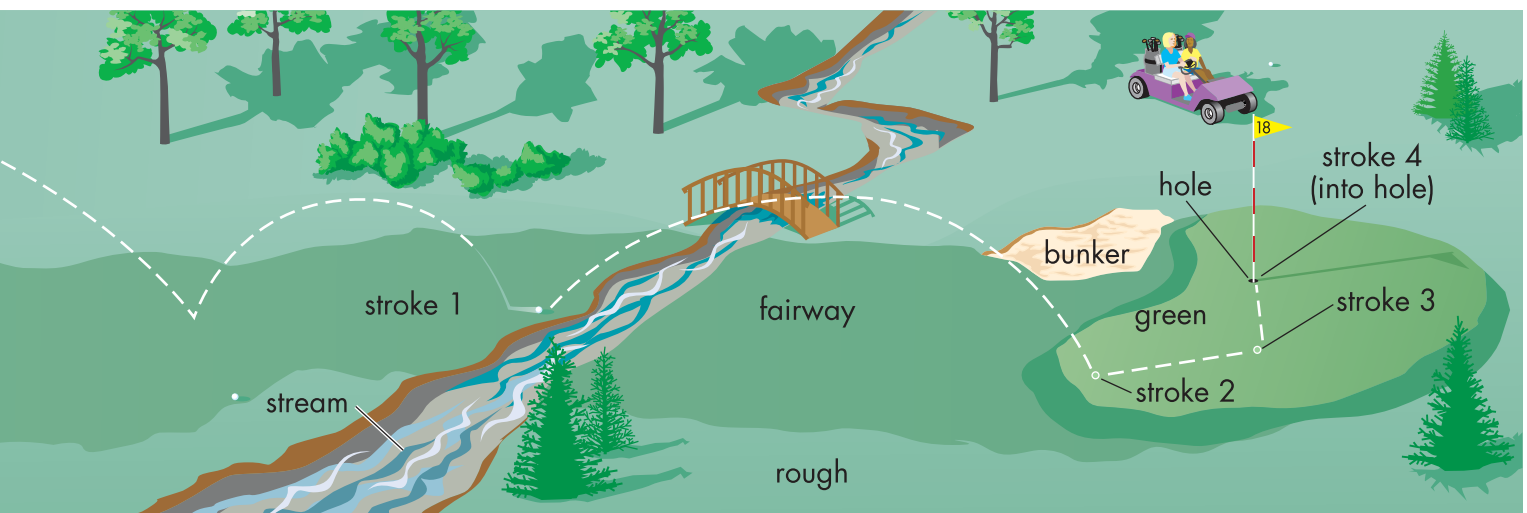
hazard is a sand-filled pit called a bunker, or sand trap. Holes may also have water hazards, such as streams or ponds. An area called the rough runs along both sides of the fairway. The rough is made up of long grass, bushes, and trees.

Golfers use a variety of clubs to hit the ball. Each club has a small hitting area at the end of a shaft. Golfers may choose a different club for each swing at the ball. They choose a club based on how far they want to hit the ball.

A golf ball is small and hard. It is made mostly of rubber. It is usually white.

Playing the Game

Golfers start playing in the teeing area. From there, they hit the ball toward the hole. They try to keep the ball on the fairway and the green. They try to avoid hitting the ball into bunkers, water hazards, or the rough. When the ball reaches the green, a golfer uses a club called a putter for the final hits toward the cup. Every time the ball is hit, one stroke is counted.



The most common type of golf competition is called stroke (or medal) play. In stroke play, the player with the lowest total number of strokes is the winner. Individual golfers have another way of judging how well they are doing. They measure their play against a standard score known as par. Par is the number of strokes an expert player would need to complete a hole.

History

Historians believe that early forms of golf were played in the Netherlands first and then in Scotland. The modern game developed in Scotland. The first golf courses were fields of grass that sheep had clipped short while grazing. The world's oldest golf organization was formed in Scotland in 1744. It created the earliest-known rules of the game.

Golf balls were originally made of wood. Wood was replaced in the 1600s by boiled feathers stuffed in a leather cover. In the 1800s people started making balls with gutta-percha, a leathery material



A water hazard surrounds a green at the Augusta National Golf Club in Augusta, Georgia, in the United States.

that comes from certain trees. Balls made of hard rubber appeared in the 1900s.

Golf started to gain some world attention in the second half of the 1800s. At that time British golfers were generally considered to be the best in the world. John Henry Taylor, Harry Vardon, and James Braid were famous British golfers of the period. In the 1920s golfers from the United States began to excel. Bobby Jones, Walter Hagen, and Gene Sarazen were outstanding U.S. golfers from that time. Arnold Palmer, Jack Nicklaus, and Tiger Woods were later stars. Great women golfers included Patty Berg, Mickey Wright, and Annika Sorenstam.

► More to explore

Woods, Tiger

Goodall, Jane

The British scientist Jane Goodall is known for her research on chimpanzees. She studied the animals for many years in the East African country of Tanzania. Her discoveries changed the way chimpanzees are studied and understood.

Jane Goodall was born on April 3, 1934, in London, England. At a young age she became interested in animals. By age 11 she dreamed of living among Africa's wildlife.

To earn money to travel to Africa, Goodall left school at age 18 and began working. At age 23 she arrived by boat in Kenya. She soon became an assistant to Louis Leakey, a famous scientist.



Jane Goodall watches chimpanzees in Kenya.

In 1960 Goodall set up camp on the shores of Tanzania's Lake Tanganyika. She studied chimpanzees close-up in their natural setting. It took months for Goodall to gain the chimps' trust, but her patience paid off.

Through her observations, Goodall changed many ideas about chimpanzees. She saw a chimpanzee make a tool, which it used to get food. Scientists had believed only humans were toolmakers. She also found that chimpanzees eat both meat and plants. Finally, Goodall observed that each chimpanzee had a distinct personality and emotions.

Goodall stayed in Tanzania until 1975. She wrote several books about her work.

► More to explore

Chimpanzee

Goose

Geese are large birds with loud, honking calls. Along with ducks and swans, they belong to a group of birds

called waterfowl in North America and wildfowl in Europe. These birds are equally at home on the water, on the land, or in the air. Common species, or types, of goose include the Canada goose, the greylag, the barnacle goose, and the snow goose.

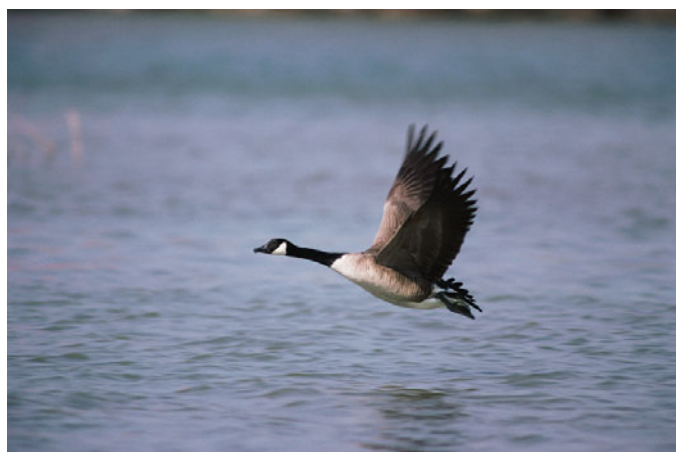
People have kept and bred geese for at least 4,000 years. People eat goose meat and use goose feathers to stuff pillows and quilts. In addition, hunters shoot wild geese for sport.

Where Geese Live

Geese live near water, mostly in the northern half of the world. Many geese migrate, or fly long distances between their summer and winter homes. They nest in cold northern regions during the summer and fly south for the winter. However, some Canada geese live in the same parts of the United States or Canada year-round.

Physical Features

Geese are generally larger than ducks but smaller than swans. For instance, the



The Canada goose is the most common wild goose in North America.

Did You Know?

A male goose is called a gander. Young geese are called goslings.

Canada goose is about 36 inches (91 centimeters) long. But geese have many features in common with ducks and swans. They have webbed feet, which help them paddle through water. They also have a gland near the tail that makes oil. This oil helps protect the feathers from water. An inner layer of soft feathers called down helps to keep waterfowl warm.

Most geese are black, brown, gray, or white. They have heavier bodies and longer necks than ducks do. Geese are also better at walking than other waterfowl are. This is because their legs are farther forward on their bodies.

Geese have humped bills that become narrower toward the tip. Their bills are good for grasping grasses, which is their main food.

► More to explore

Bird • Duck • Migration, Animal
• Swan

Gorbachev, Mikhail

Mikhail Gorbachev was the last leader of the country called the Soviet Union. Gorbachev's efforts to change his country helped to lead to the breakup of the Soviet Union in 1991.

Mikhail Sergeyevich Gorbachev was born on March 2, 1931, at Privolye, in southwestern Russia. At that time, Russia was a part of the Soviet Union. A group called the Communist Party ruled



Mikhail Gorbachev

the Soviet Union. Gorbachev joined the Communist Party in 1952. He received his law degree from Moscow State University in 1955.

Gorbachev rose steadily in the Communist Party. In 1985 he became the party's general secretary. This made him the leader of the Soviet Union.

When Gorbachev came to power the Soviet Union was a very strict country. The people were not allowed to voice their opinions openly. The country was often in conflict with other countries, especially the United States. Over time Gorbachev began to make changes. He allowed greater freedom of speech. He also developed better relations between the Soviet Union and other nations.

Gorbachev's changes led to an unexpected result—the end of Communism in Europe. Communists ruled several countries around the Soviet Union. The people in those countries began to demand change as well. Eventually the governments collapsed. In the Soviet Union itself, Gorbachev allowed real elections for the first time.

Many people praised Gorbachev for the changes he made. However, some Communists opposed Gorbachev's rule. In August 1991 a group of them tried to take control of the government by force. The takeover failed, but Gorbachev's position had weakened. On December 25, 1991, Gorbachev quit the presidency. By the end of the year the Soviet Union had officially ceased to exist.

► More to explore

Cold War • Union of Soviet Socialist Republics

Gorilla

Gorillas are the largest apes. They are also the largest animals of the group called primates, which also includes the other apes, humans, and monkeys. After



Adult male gorillas are called silverbacks because they have gray or silver hairs on their lower back.

chimpanzees and bonobos, gorillas are the closest living relatives to humans. Movies often show gorillas as fierce creatures. But they are actually peaceful and gentle animals.

Gorillas live in rain forests in Africa. There are three kinds of gorilla. The western lowland gorilla is found in western Africa. The eastern lowland gorilla and the mountain gorilla are found in east-central Africa. All gorillas are endangered, or at risk of dying out completely. The mountain gorilla has become especially rare.

Adult male gorillas may be 5.5 feet (1.7 meters) tall and weigh 300 to 600 pounds (140 to 270 kilograms). The females weigh about half as much as the males. Adult gorillas have long, strong arms and short, stocky legs. The chest is very thick and strong. The males have a bony crest on top of the head. Gorillas have a coat of black hair except on their faces, hands, and feet.

Gorillas live in family groups of about 6 to 30 animals. One or two older males lead the group. Gorillas use their arms and legs to walk. They support part of their weight on the knuckles of the hands. They rarely stand up straight. Gorillas spend most of their time on the ground. But they may also climb trees to sleep and feed. Gorillas eat plants, including fruits, leaves, stalks, and shoots.

► More to explore

Ape • Endangered Species • Primate

Did You Know?

If threatened, a male gorilla may beat his chest and make loud sounds to scare away intruders.

Gospel Music

Gospel music is a form of African American religious music. Worshippers play and sing gospel music at some Protestant Christian church services. The word gospel means “good news,” and gospel songs often praise God or Jesus. Many gospel songs also describe struggles and hard times.

Small groups of singers, choirs, and soloists (single singers) perform gospel music. Singers are usually very emotional and expressive. A wide range of instruments—for example, organ, guitars, banjos, or brass instruments—may provide background music.

Many gospel songs have parts known as call and response. In this type of singing, the leader sings a phrase and then the group responds with a repeated line.



Many gospel singers are very expressive when they sing.

The roots of gospel music can be traced back to African slaves in North America in the 1700s. At that time slave owners made slaves attend church services. At these services the slaves learned Christian hymns. They made up work songs and religious songs, called spirituals, based on these hymns.

After the end of slavery African American preachers used music during their sermons. During the early 1900s recordings of these sermons became available. In this way gospel music spread to a wider audience. Popular singers began using the forms and sound of gospel music. In turn, popular music, such as the blues, also influenced gospel music. Some of the best-known gospel singers and songwriters were Thomas A. Dorsey, C.A. Tindley, C.L. Franklin, and Mahalia Jackson.

► More to explore

Blues • Christianity • Music

Gourd

Gourds are hard-shelled fruits. They are generally used as decorations or in crafts. Gourds come in a wide variety of shapes and are often very colorful. They are related to pumpkins, squashes, cucumbers, and melons.

Gourds first grew in the Americas and in tropical Africa and Asia. They were among the first plants grown by people. Today gourds are grown throughout the world in the tropics and in mild areas.



Colorful gourds are often used as decorations.

Gourds grow on vine plants. The vines are sticky and covered with rough, prickly hairs. The leaves are large, and the flowers are white or yellow. The smallest gourds are the size of a marble. The largest are more than 7 feet (2 meters) long. Some gourds are white, but many others have bands, stripes, or spots in shades of yellow and green. Some have smooth skin, while others have bumps or spines.

In some countries people eat gourds. But mostly people use gourds to make musical instruments, pipes, masks, and containers such as water jugs. The inside of one type of gourd is dried and used as a sponge called a loofah.

► More to explore

Fruit • Pumpkin • Squash

Government

The government of a modern nation, or country, is an organization that does many things. It defends the country from outside enemies. It keeps order within the

country. And it does services for its people. In return, the people of the country must pay money called taxes to the government. They also must obey the government's rules, which are called laws. States and cities have governments, too.

Powers of Government

There are three kinds of government power: legislative, executive, and judicial. The legislative branch of the government makes laws. The executive branch enforces the laws and runs most government departments. The judicial part settles disagreements about the law and runs the courts.

Forms of Government

Governments can be set up in many ways. Most modern governments fit into a few types.

Democracy

Democracy is government of the people, by the people, and for the people. In direct democracy all citizens vote on everything. Direct democracy works best in places where there are few people. Modern democratic countries have representative democracy instead. In a representative democracy citizens vote for representatives to make decisions for them.

In a democracy people are free to start and join political parties. Parties are groups of people who agree with each other on political issues.

Most modern democracies have constitutions. A constitution is a document

Did You Know?

The word government comes from a Greek word meaning "to pilot a ship."



Two justices (high-level judges) of the Navajo Supreme Court hear a case. The court is a part of the judicial branch of the government of the Navajo people.

that organizes the government and sets limits on its power. The two main types of constitutional democracy are the presidential system and the parliamentary system.

Presidential System

The presidential system is common in republics (countries with no king or queen), including the United States. In a presidential system the executive and legislative branches are separate. The people elect representatives for a legislature, or lawmaking body. They also elect a president to be the head of the executive branch. The president is not allowed to be a member of the legislature.

Parliamentary System

The United Kingdom and many of its former colonies have a parliamentary system. In a parliamentary system, the legislative and executive branches of government are not separate. The people elect members of a legislature, called a

parliament. But they do not elect the head of the executive branch, called the prime minister. The prime minister is a member of the parliament. Usually, the prime minister is the leader of the political party with the most members in the parliament.

Monarchy

Hundreds of years ago almost all countries were monarchies. A monarch is a king or a queen. Monarchs are not elected. They inherit their titles from their families.

In the kind of monarchy called an absolute monarchy, the monarch has unlimited power. A few absolute monarchies still exist. But most modern monarchies, including the United Kingdom, are limited, or constitutional, monarchies. In a constitutional monarchy the monarch has little or no power. An elected parliament and a prime minister run the country. This is why constitutional monarchies also count as democracies.



Students outside the Arkansas Capitol protest a proposed change to Arkansas's constitution. A constitution is a document that explains how a government works.

Dictatorship

Some countries have a ruler who is not a king but still has unlimited power. Such a person is called a dictator. Many dictators take power by force. Some call themselves the president. Others are generals in the army. Only the dictator's political party is allowed to exist.

Levels of Government

People in modern countries live under several levels of government at the same time. For example, most people in the United States live in a city or village, a county, and a state. In general, national governments fit together with lower levels of government in two different ways. They are called the unitary system and the federal system.

Most of the world's countries, including the United Kingdom, France, and Japan, have a unitary political system. In such a system the national government supervises local governments. Some unitary governments allow local areas to elect some of their leaders. In others the national government chooses local leaders.

A federal political system is found in other countries, including Argentina, Australia, Brazil, Canada, India, Russia, and the United States. In a federal system the national government shares power with local governments. Local governments elect their own leaders and make their own laws, as long as they do not go against national law. Federal systems are found most often in large countries.



Each of the 50 U.S. states has its own government. The legislative or lawmaking branch meets in the state's Capitol.

World Government

Throughout history disputes between countries have often led to wars. In the 1900s countries of the world began to work together to settle disputes peacefully instead. These efforts led to the United Nations (UN). The organization was formed in 1945 after the end of World War II.

The majority of the countries of the world belong to the UN. The UN is not considered a world government because it does not create and enforce laws for individual people to follow. However, because the UN attempts to set rules for all the countries of the world, it could be described as a government of governments.

► More to explore

City • Constitution • Country
• Democracy • Dictatorship • Law
• Monarchy • Parliament • Political
Party • Republic • State Government
• United Nations • United States
Government

Graham, Martha

As a dancer and choreographer (creator of dances), Martha Graham had a powerful influence on modern dance. She rejected traditional graceful styles of dancing and used forceful movements that expressed strong emotions.

Graham was born near Pittsburgh, Pennsylvania, on May 11, 1894. She moved to California with her family in 1908. As a teenager she studied at the Denishawn dance school, where she learned dance styles from around the world. She later became a member of the Denishawn dance company. Her great dramatic power made her a favorite with audiences.

In 1923 Graham went to New York, where she danced and later taught dance. In 1926 she formed a dance company. Not all her early pieces were immediately successful. They were

unlike dances that audiences were used to seeing and were set to unfamiliar modern music. Graham later won wide praise for her works. Among them were *Appalachian Spring* (1944), which was about American frontier life.

In the late 1920s Graham founded a dance school, where she developed a distinctive dance technique. Important dancers who studied with Graham include Merce Cunningham, Paul Taylor, Twyla Tharp, and Alvin Ailey.

Graham did not retire from dancing until she was 75. She continued to choreograph until she died, on April 1, 1991, in New York City. She created 181 dance works in all. The dance technique she developed is still taught at many dance schools.

► More to explore

Dance



Martha Graham dances in *Appalachian Spring* in New York City in 1944.

Grain

Grains are types of grass that produce seeds that can be eaten. Grains are also called cereals. Wheat, rice, and corn are the most commonly grown grains. Other important grains include barley, oats, rye, millet, and sorghum.

A grain seed has three parts: the bran, the germ (or embryo), and the endosperm. The bran is the outer layer. It protects the inside of the grain. The germ is the part of the grain that can grow into a new plant. The endosperm provides food for the germ. A grain described as “whole” has all three parts.



A woman in Nigeria pours grains of millet into a bowl. Uneatable pieces are lighter and blow away.

Processed, or refined, grains usually have had the bran and the germ removed. Whole grains have more nutrients than refined grains.

People eat grains in a number of ways. They eat rice and corn on their own. They also eat grains as ingredients of other foods, such as breakfast cereals and soups. Grains are also eaten in the form of flour. Flour is made by crushing grains into tiny pieces. The grain most commonly used to make flour is wheat. People use flour to make bread, cookies, crackers, cakes, and pastas.



Baskets hold grains for sale at a market.

Grains have other uses, too. Farmers use grains to feed farm animals. They use straw, or the stalks of grain plants, as bedding for animals. People also use grains in industry. Grains are used to make oils, alcohols, and other products.

► More to explore

Barley • Corn • Grass • Millet • Oats
• Rice • Rye • Seed • Sorghum • Wheat

Grammar

Grammar is a set of rules that tells how a language works. Every language has its own set of rules. The rules of grammar explain what different kinds of words do and how they work together.

Types of Words

In English, there are nine basic types of words. These types are called parts of speech. The parts of speech are nouns, articles, pronouns, verbs, adjectives, adverbs, prepositions, conjunctions, and interjections.

How Words Work Together

In English, grammar mainly involves the order of words. The meaning of a sentence changes if the word order changes. Here are two sentences: The car hit the tree. The tree hit the car. These two sentences have the same words. But because the word order is different, the meaning is different.

The word order also decides whether the sentence makes sense. In English, the subject, or main noun, of a sentence usually comes before the verb. For

Did You Know?

Many people think that it is important for children to learn grammar. U.S. elementary schools used to be called grammar schools.

Grammar		
Part of Speech	What It Does	Examples
noun	stands for people, places, or things	teacher school book
article	tells whether a noun is specific or general	the (specific) a (general)
pronoun	replaces a noun	she it they
verb	tells what a noun or a pronoun does	talk read
adjective	describes a noun or a pronoun	smart large funny
adverb	describes a verb, an adjective, or another adverb	happily always
preposition	tells how words in a sentence relate to one another in time or space	to with
conjunction	combines parts of a sentence, or whole sentences, into one sentence	and but or
interjection	shows emotion	oh yuck

example, “Ran quickly the girl” does not make sense because the subject (the girl) comes after the verb (ran). Other languages have different rules about word order.

► More to explore

Language

Grand Canyon

Noted for its fantastic shapes and colors, the Grand Canyon is one of the most

spectacular sights in the United States. The vast canyon was cut through many layers of rock by the muddy waters of the Colorado River. It runs for 277 miles (446 kilometers) through north-western Arizona, ranging from about 0.1 to 18 miles (0.2 to 29 kilometers) wide. In places the canyon is more than a mile (1.6 kilometers) deep.

Some of the rocks in the Grand Canyon are 4 billion years old. The Colorado River began eroding, or wearing down, the rocks about 6 million years ago. Wind and rain have helped the erosion process. Some of the rock towers that rise from the depths of the canyon look like castles and temples. The canyon is mostly red, but different layers of rock are buff, gray, green, pink, and violet.

Willow trees and cottonwoods grow at the bottom of the canyon where there is plenty of water. There are magnificent forests of pine, fir, spruce, and aspen on the canyon’s north rim. Cacti are common in drier areas. Wildlife includes coyotes, foxes, deer, badgers, pumas,



The Grand Canyon’s unique beauty attracts millions of visitors each year.

bobcats, rabbits, squirrels, and chipmunks.

Grand Canyon National Park was created in 1919 and enlarged in 1975. A paved road and a trail connect the north and south rims of the canyon. Mule-pack trips and river rafting are popular ways of exploring the canyon.

► More to explore

Arizona • Canyon • Colorado River
• Erosion

Grant, Ulysses S.

Ulysses S. Grant became the 18th president of the United States in 1869. A few years earlier Grant had led the Union armies to victory in the American Civil War. He was less successful as a president than as a general.

Early Life

Hiram Ulysses Grant was born in Point Pleasant, Ohio, on April 27, 1822. His parents were Jesse Root Grant, a tanner and a farmer, and Hannah Simpson. At age 17 Grant entered the U.S. Military Academy at West Point, New York. By mistake, the academy recorded his name as Ulysses S. Grant. After graduating in 1843, Grant kept the new name.

From 1846 to 1848 Grant fought in almost every battle of the Mexican War. He then married Julia Boggs Dent, with whom he had four children. In 1852 Grant took an assignment on the Pacific coast. Homesick, he soon resigned from the Army and settled



Ulysses S. Grant was the 18th president of the United States.

with his family near Saint Louis, Missouri. After failing at farming, he joined his brothers in their leather business in Galena, Illinois.

Civil War

At the start of the Civil War in 1861, Grant gathered and trained troops for the Union. In 1862 he and his forces won the first major Union victory of the war at Fort Donelson in Tennessee. After that battle Grant earned the rank of major general.

In 1863 Grant led Union victories at Vicksburg, Mississippi, and Chattanooga, Tennessee. The next year he gained command of all the Union armies. Grant accepted the surrender of Confederate general Robert E. Lee in Virginia in 1865. After the war Grant became a general, the highest rank in the Army.

Presidency

In 1868 the Republican Party nominated Grant for president. He defeated his Democratic opponent, Horatio Seymour, and took office in March 1869. He was reelected in 1872.

President Grant faced serious problems resulting from the Civil War. He favored harsh policies against the defeated Southern states. He also supported civil rights for former slaves. Grant worked for the 15th Amendment to the Constitution, which gave African Americans the right to vote.

Grant's popularity fell in his second term because of political scandals. The public learned that important Republican politicians had made illegal business deals.

Retirement

After leaving office in 1877, Grant toured Europe and Asia and then moved to New York City. In the 1880s he lost

most of his money in a failed business. To support his family he began to write the story of his life. Grant finished his book about a week before his death from cancer on July 23, 1885.

► More to explore

American Civil War • United States

Grape

Grapes are bulb-shaped fruits. They can be eaten fresh, dried to make raisins, or crushed to make grape juice or wine. There are more than 8,000 varieties of grape.

Grapes grow in wooded and warm regions of the world. Large quantities grow in France, Spain, Italy, Turkey, and Georgia. About a thousand grape varieties have been developed in the United States.

The grape plant is a woody vine. When left untrimmed, the vine often grows 56



TIMELINE

Grant is born in Point Pleasant, Ohio.

April 27, 1822

Grant is elected president.

1868

During the Civil War Grant gains command of the Union armies.

Grant supports the 15th Amendment, which gives freed slaves the right to vote.

Grant is elected to a second term.

1872

Grant retires.

1877

Grant dies in Mount McGregor, New York.

July 23, 1885



Grapes come in thousands of different varieties. They range in color from yellow or pale green to deep purple or black.

feet (17 meters) or more. (Trimming, however, is important for proper growth of the vine.) Leaves are large and rounded with tooth-shaped edges. Flowers are small and green and appear in clusters. These eventually become the grape fruits.

Grapes vary in color. They range from pale green or yellow to red, purple, or black. Some grape varieties develop a powdery coating. Inside, most grapes have seeds and juicy pulp. Grapes are a good source of minerals and vitamin A.

Grapes have a long history. Grape seeds have been found along with mummies in Egyptian tombs that are at least 3,000 years old. The ancient Greeks and Romans grew grapes to make wine. From there grapes spread throughout the world.

► More to explore

Fruit

Grapefruit

The grapefruit is a tart, juicy citrus fruit that grows on trees. It is a good source of vitamin C. It is called grapefruit because it grows in clusters like grapes do. The scientific name of the grapefruit tree is *Citrus paradisi*.

The United States is one of the world's leading grapefruit producers. Grapefruit are grown mainly in the warm, sandy soils of Florida, Texas, Arizona, and California. Other major grapefruit producers include Israel, Mexico, Cuba, and South Africa.

The grapefruit tree has spreading branches, thorny twigs, and dark, shiny green leaves. It grows about 25 feet (7.6 meters) tall in orchards, but it can be larger. It has large, sweet-smelling white flowers.

The fruit is round and measures 4 to 6 inches (10 to 15 centimeters) across. It has a lemon-yellow rind, or outside covering, when it is ready to be picked. The



Grapefruit grow in clusters on trees with shiny, green leaves.

pulp, or soft inside, is light yellow, pink, or red. The pulp has about 10 to 14 sections. Each section is surrounded by a bitter skin and may include seeds.

Grapefruit are picked by hand or harvested with a machine that shakes the tree's limbs. They are usually eaten fresh. The juice is sold fresh, frozen, or canned.

► More to explore

Citrus Fruit

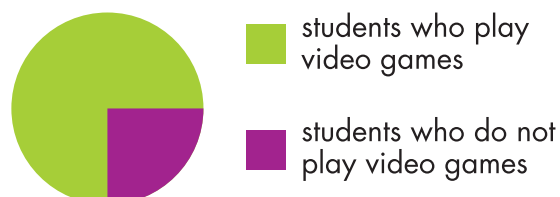
Graph

Graphs are drawings that show mathematical information with lines, shapes, and colors. Graphs are also known as charts. People use graphs to compare amounts of things or other numbers. Graphs are useful because they can be easier to understand than numbers and words alone.

There are many different kinds of graphs. Some of the most common kinds are circle graphs, bar graphs, and line graphs.

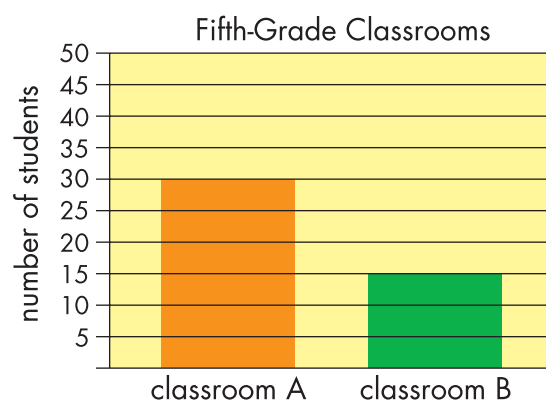
Circle Graphs

Circle graphs are also called pie graphs because they look like a pie divided into wedges. Circle graphs show amounts of different things as small or large sections of the circle. For example, a circle graph



could show that three quarters of the students in a classroom play video games. The whole circle would represent all the students. Three quarters of the circle would be one color, to represent the video-game players. The remaining quarter of the circle would be another color, to represent the students who do not play.

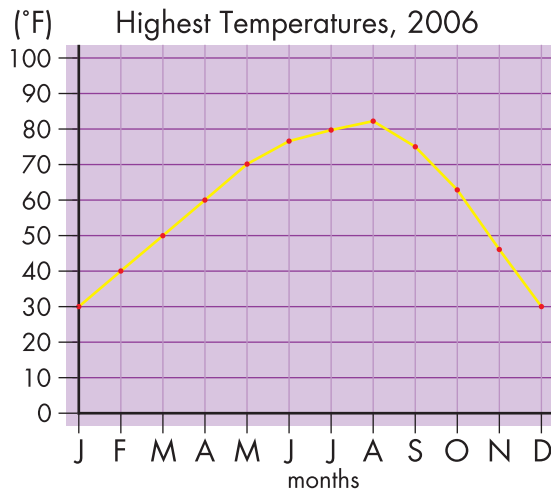
Bar Graphs



A bar graph shows amounts as bars of different sizes and, sometimes, of different colors. Longer bars represent larger numbers. For example, a bar graph could show that one classroom had 30 students and another classroom had 15 students. Two bars would represent the different classrooms. The bar for the classroom with 30 students would be twice as long as the bar for the classroom with 15 students.

Line Graphs

A line graph uses dots connected by lines to show how amounts change over time. For example, a line graph could show the highest temperature for each month during one year. One side of the graph would show a range of temperatures. The bottom of the graph



would show the months. A dot over each month would represent the highest temperature for that month. Each dot would line up with the correct temperature on the side of the graph. A line connecting the dots would show how temperatures rose and fell over the year.

► More to explore

Mathematics • Numbers and Number Systems

Grass

Grasses are a family of plants with leaves that usually look like blades. Most of them also have hollow stems and many branching roots. The green grass found in yards, the grasses growing on open land, grains, and bamboos all belong to the grass family.

Where Grasses Grow

Grasses grow almost everywhere on Earth because they can survive in many different climates. Large areas of wild grass are called grasslands.

Physical Features

Some grasses, such as bluegrass, are very short. Others, such as giant bamboos, grow as tall as 100 feet (30 meters). Most grasses are soft and bendable, but bamboos are harder, woody grasses.

In tropical regions grass leaves are broad. Desert grasses have spiky leaves that help keep moisture inside. The leaves of some water grasses are waxy. The waxiness protects them from the water.

Uses

Since ancient times people have eaten the seeds of many grasses. These grasses, called grains or cereals, include corn, barley, millet, oats, rice, rye, sorghum, and wheat. Livestock, or farm animals that are raised by people, also eat grains. Both livestock and wild animals graze on wild grasses.

After people take the seeds from cereals, the stalks of the plants are left. When dried, these stalks are called straw. Farmers cover the floors of barns with straw.



The green grass in Central Park helps New York City look nice and is also good for the environment.

People in some parts of the world use straw to build roofs. People also weave straw to make furniture, mats, baskets, and hats.

People grow grass lawns because grass makes a yard look green and attractive. But grasses are also important to the environment. Grass roots spread in all directions. These roots prevent erosion, or the loss of soil, by holding the soil in place.

► **More to explore**

Bamboo • Grain • Grassland

Grasshopper

Grasshoppers are leaping insects that are found all over the world. They live mostly in forests or grasslands, but they are also common in gardens. Their brown or green coloring helps them blend in with the plants and dirt around them. Grasshoppers are closely related to crickets.

Compared to many other insects, grasshoppers are large. Some are more than 4

inches (11 centimeters) long. Grasshoppers have long hind legs that are good for jumping. They have antennas, or feelers, on their heads that they use to touch and smell. They also have special eyes that allow them to see in all directions at once.

Most grasshoppers eat only plants. Some kinds, such as locusts, move in swarms and destroy farmers' crops.

Usually only male grasshoppers chirp or sing. They make their song by rubbing their wings together or by rubbing their hind legs against their front wings. The song is the male's way of calling females.

► **More to explore**

Cricket • Insect • Locust

Grassland

Grasses grow in wide, open spaces around the world. Large areas covered with grasses are called grasslands. Tropical grasslands grow close to the equator. Temperate grasslands grow in regions farther from the equator.

Features

Many different kinds of grass grow on the world's grasslands. Grasslands may have no trees or only a scattered few. Usually the land is flat. Sometimes it has rolling hills.

Grasslands are good for grazing livestock. Grasslands also have good soil for farming. Wheat, oats, corn, and other crops have replaced many wild grasses.



Grasshoppers use their long hind legs for jumping.

Types of Grasslands

Tropical grasslands are often called savannas. Africa, India, Southeast Asia, Brazil, and Australia all have areas of tropical grassland. The climate of savannas is extreme. Temperatures are high, and there are wet and dry seasons.

The climate in temperate grasslands is less extreme. The prairies of North America are temperate grasslands. So are the pampas of Argentina, the veld of southern Africa, and the steppes of central Asia. The huge rangelands in Australia's southeastern corner are also temperate grasslands.

Life in the Grasslands

The large animals that live in tropical grasslands include zebras, gazelles, lions, and kangaroos. Horses, antelope, hawks, and prairie dogs are a few of the animals that live in temperate grasslands.

In the past wandering peoples lived on many of the world's grasslands. For example, the Mongols lived on the steppes of central Asia. The Plains Indians lived on the prairies of North America.



The grasslands in central North America are called prairies.

Changing Grasslands

In the 1800s farmers moved onto the grasslands of southern Africa, Australia, South America, and North America. They began changing the grasslands into farmland. In North America the prairies once extended down the middle of the continent, from Canada to Texas. Now most of this land is farmland. The Australian grasslands and the South American pampas have also become mostly farming and grazing lands. Grasslands have also disappeared as cities and towns have expanded.

But much grassland still exists. The veld still carpets large parts of southern Africa. Steppes extend 5,000 miles (8,000 kilometers) from eastern Europe to eastern China. They are mostly unspoiled wilderness, and few people live there.

► More to explore

Grass



The sun sets on a savanna in the African country of Kenya.

Gravity

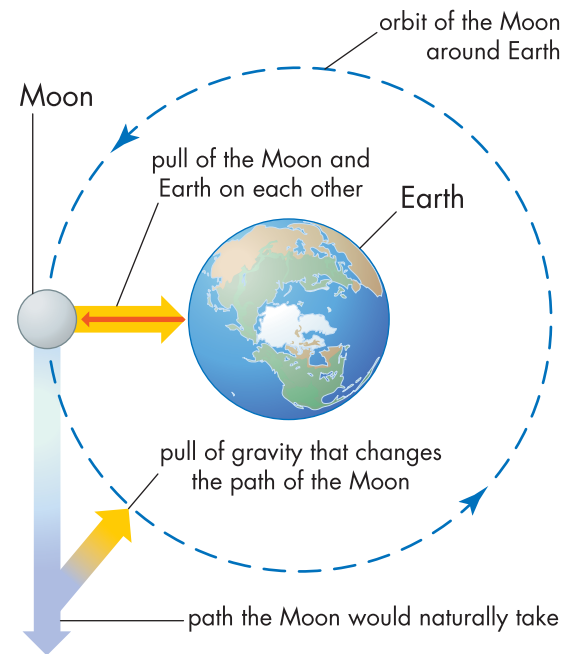
All objects attract other objects because of a force called gravity. Gravity is a pulling force that works across space. That is, objects do not have to touch each other for the force of gravity to affect them. For example, the sun, which is millions of miles from Earth, pulls on Earth and the other planets and objects in the solar system.

Gravity on Earth

On Earth gravity pulls objects toward the center of Earth. This is what makes objects fall. It is also what gives an object weight. Weight is a measurement of the force of gravity between an object and the surface it stands on. If a person stands on a scale, gravity pulls the person against the scale. The scale shows the strength of this force, or the person's weight.



Gravity is what gives weight to objects on Earth. Scales measure the pull of gravity as weight.



Gravity keeps the Moon moving in an orbit around Earth.

Gravity in Space

In the solar system the planets all orbit, or travel around, the sun in a constant path. They would move in a straight line, but the force of gravity pulls them toward the sun. At the same time, the speed of the planets in their orbits keeps them from falling into the sun.

Spacecraft and satellites travel around Earth in a similar way. Earth's gravity keeps them in orbit, and their speed keeps them from falling back to Earth.

When astronauts are inside a spacecraft in orbit, they experience weightlessness. The astronauts float freely because they are traveling around Earth at the same speed as the spacecraft. But even though Earth's gravity does not pull them toward the floor—as it does on Earth—they have not escaped it. Earth's gravity

keeps the astronauts in orbit, just as it does the spacecraft.

Newton's Law of Gravity

Isaac Newton, an English scientist, discovered a law, or truth, about gravity in the late 1600s. Newton said that the force of gravity between objects depends on their mass, or the amount of material they contain. The greater the mass of an object, the greater is its force of gravity. For example, the sun, which has a very large mass, has a greater force of gravity than Earth, which has a much smaller mass. Even a speck of dust has a force of gravity. But its gravity is very, very small.

The force of gravity also depends on the distance between two objects. The smaller the distance, the greater is the force of gravity between them.

► More to explore

Newton, Isaac • Solar System

Great Barrier Reef

The Great Barrier Reef is the largest coral reef on Earth. A barrier reef is a long, narrow coral formation that lies parallel to the shoreline of a landmass and is mostly underwater. The Great Barrier Reef is in the Coral Sea, off the northeastern coast of Australia. It extends 1,250 miles (2,000 kilometers) from north to south.

The Great Barrier Reef is a tourist attraction and a protected marine environment. The sea life of the reef is



Colorful corals and fish help to create the striking beauty of the Great Barrier Reef.

extraordinary. The reef has been formed over millions of years from the skeletons of millions of tiny corals. There are at least 300 types of hard coral on the Great Barrier Reef. Other animals include sponges, anemones, worms, snails, lobsters, crayfish, prawns, jellyfish, and giant clams. Certain algae give the reef a purplish red rim. There are also hundreds of different birds in the area and more than 1,500 types of fish, many with brilliant colors and unusual shapes.

► More to explore

Australia • Coral

Great Britain

Great Britain is the largest island in Europe. It contains England, Scotland, and Wales. Together with Northern Ireland, they make up the country of the United Kingdom of Great Britain and Northern Ireland. Sometimes the term Great Britain is used to refer to the whole United Kingdom. Great Britain is



located off the northwestern coast of mainland Europe.

► More to explore

England • Scotland • United Kingdom
• Wales

Great Depression

During the 1930s much of the world faced harsh economic conditions. Many people were out of work, hungry, or homeless. This period is called the Great Depression. It started in the United States, but it quickly spread throughout the world.

Effects in the United States

During the 1920s many people invested their money in stocks (shares of ownership in companies). For a few years the value of stocks rose rapidly. In September 1929, however, stock prices began to fall. On October 29 they “crashed.” This meant that people’s stocks were now worth almost nothing. This day became known as Black Tuesday.

Many people lost all the money they had. Banks were hurt as well. People who had borrowed money from banks were unable to pay it back. Many banks failed because crowds of people tried to take out all their money at once. When a bank failed, people with accounts there lost their savings. In addition, factories and businesses closed because not enough people were able to buy the goods they produced or sold.

By 1932 about 12 to 13 million people were out of work. People with jobs were paid only about half of what they had earned before. Dry weather in the Great Plains made things even worse for farmers. They could not grow enough crops to sell. The land was so dry that it was called the Dust Bowl.

Effects Around the World

The situation in the United States affected countries all over the world. The United States could no longer lend as much money or trade as many goods



Women serve soup and bread to the unemployed during the Great Depression.

with other countries. Great Britain, Germany, and other countries suffered from the loss of U.S. loans and trade.

End of the Great Depression

In the United States angry voters turned President Herbert Hoover out of office in 1932. The new president, Franklin D. Roosevelt, had a program that he called the New Deal. The New Deal put some people back to work right away. It also changed the financial (banking and money) system to prevent the same problems from happening in the future.

The Great Depression ended in the United States only after the country entered World War II in 1941. Factories began to produce weapons, airplanes, ships, and other products necessary for the war effort. Many people were then able to get jobs.

► More to explore

Dust Bowl • New Deal • Stock Exchange

Great Lakes

The Great Lakes are five large lakes in eastern North America. They are Lakes Superior, Michigan, Huron, Erie, and Ontario. Together the Great Lakes cover an area of about 94,850 square miles (245,660 square kilometers). They form the largest connected area of freshwater on Earth.

Lake Michigan is the only one of the Great Lakes that is completely within the United States. The other four form a natural border between Canada and the



United States. Lake Superior is the largest and the deepest of the Great Lakes. Lake Ontario is the smallest. Lake Erie is the shallowest. Lake Huron has the longest shoreline.

The Great Lakes affect the climate of the surrounding land. They absorb a lot of heat in the summer. In the winter they release heat into the air. As a result, the land closest to the lakes has cooler summers and warmer winters than areas farther inland. Large parts of the lakes freeze during winter.

The Great Lakes are important to the economy of North America. Major cities in the region include Milwaukee, Wis-



Sailboats compete in a race across Lake Huron.

Did You Know?

The Great Lakes are at different heights above sea level. Lake Superior is the highest, and Lake Ontario is the lowest.

consin; Chicago, Illinois; Cleveland, Ohio; Detroit, Michigan; and Toronto, Ontario. ships carry iron ore, coal, grain, and manufactured goods to and from the cities. The Saint Lawrence Seaway connects the Great Lakes with the Atlantic Ocean. The lakes also supply water to nearby cities.

Fishing was once a major industry on the lakes. However, pollution and other factors led to its collapse. Today only some commercial fishing takes place. Sport fishing is more common.

The Great Lakes are popular recreation areas. Powerboating and sailing are popular. Many beaches stretch along the shores.

► More to explore

Erie, Lake • Huron, Lake • Michigan, Lake • Ontario, Lake • Saint Lawrence River and Seaway • Superior, Lake

Great Victoria Desert

The huge Great Victoria Desert stretches across southern Australia. It lies in the states of Western Australia and South Australia. Sand dunes cover much of the desert. In some places a layer of tightly packed pebbles covers the ground.

Summers in the Great Victoria Desert are very hot. Winters are cooler, and nighttime temperatures may drop below freezing.



Scattered eucalyptus and acacia trees, shrubs, and grasses grow in the desert. Skinks, geckos, monitor lizards, copperhead snakes, and other reptiles live there. Mice, dingoes, and foxes also make their home in the desert.

Few people live in the Great Victoria Desert. The government of Australia uses parts of the desert for weapons testing. Some Aboriginal people live in the eastern regions. There are also several national parks in the desert.

► More to explore

Australia • Desert

Great Wall of China

The Great Wall of China winds across the Chinese countryside for more than 4,000 miles (6,500 kilometers). It is one of the biggest structures ever made by humans. The ancient Chinese built the wall to protect against invading armies. Today it is a tourist attraction and a symbol of China.



The Great Wall of China winds through a hilly area.

The Great Wall is made of dirt, stone, and brick. Its height ranges from 15 to 30 feet (5 to 9 meters), and its width is 15 to 25 feet (5 to 8 meters). Many watchtowers rise above the wall, and a roadway runs along the top.

Workers began constructing the Great Wall in the 600s BC. It was built in several sections. In the 200s BC the Chinese joined the sections together. The Chinese stopped using the wall for protection in the 1600s. The wall fell into ruin, but in the 1900s parts of it were rebuilt.

► More to explore

China

Great Zimbabwe

Great Zimbabwe was a city at the heart of an African trading empire from about

1100 to 1500. Ruins of the city can still be seen in what is now the country of Zimbabwe in southern Africa.

The people of Great Zimbabwe were part of a group called the Shona. The Shona are Bantu-speaking peoples who still live in Zimbabwe. They farmed and raised cattle. They made pottery, sculpture, and



A hut has been built close to the ruins of the Great Zimbabwe city.

bone tools. However, they are best known as traders of gold. They traded along the coast of the Indian Ocean.

People stopped living in Great Zimbabwe before 1500. They left behind stone and brick buildings that archaeologists study today.

The oldest part of the city was built on a hill. Archaeologists call it the Hill Complex. It may have been a religious center. Its walls are up to 20 feet (6 meters) thick and 36 feet (11 meters) high. They were built partly with odd-shaped rocks and partly with blocks of cut stone.

South of the Hill Complex is something known as the Great Enclosure. The outer wall is about 820 feet (250 meters) around. It rises 36 feet (11 meters) at its highest point. The Great Enclosure was the largest structure in ancient Africa south of the Sahara. Archaeologists do not know what it was used for.

► More to explore

Zimbabwe

Greco, El

Paintings by El Greco are known for their brilliant colors and strong contrasts of light and shadow. El Greco also stretched out the figures in his paintings. Their bodies and limbs are unusually long, thin, and muscular. Although El Greco was Greek, he lived much of his life in Spain, where he became the first great master of Spanish painting.

El Greco was born in 1541 in Candia (now Iráklion), on Crete, an island south of Greece. His original name was Doménikos Theotokópoulos. Not much is known about his early life. In the 1560s he traveled to Italy, where he studied the painting style of Italian artists of the period. While in Italy he acquired the nickname El Greco, which means “The Greek.”



El Greco painted Saint John the Evangelist. El Greco often used secondary colors—green, purple, and orange—in his paintings.

El Greco left Italy for Spain in the late 1570s. He settled in Toledo, Spain, which was then a religious and cultural center. He created many religious paintings for the city’s Roman Catholic churches and monasteries as well as for private clients. El Greco died in Toledo on April 7, 1614. He remains one of the world’s most admired painters.

► More to explore

Painting

Greece

In ancient times Greece was a center of science, philosophy, and art. In the 1900s the country experienced wars and changes of government. Today Greece has become an important member of the European Union. The capital and largest city is Athens.

Geography

Located in southeastern Europe, Greece includes a mainland and about 2,000 islands. The Greek mainland shares borders with Albania, Macedonia, Bulgaria, and Turkey. The Ionian, Mediterranean, and Aegean seas surround all of Greece.

About 80 percent of Greece consists of mountains. The Pindus Mountains run north and south on the mainland. Greece's highest peak, Mount Olympus, is in the east; it rises to 9,570 feet (2,917 meters). Summers are hot and dry, and winters are mild and rainy. Earthquakes are common.

Plants and Animals

About one fourth of Greece is forested. The northern mountains have forests of chestnut, ash, and beech trees. Firs and pines grow on the upper slopes. Other plant life includes evergreen oak and cypress trees, as well as juniper, myrtle, and oleander shrubs.

Bears, wolves, wildcats, martens, wild boars, lynx, and deer live in the mountain forests. Jackals, wild goats, and porcupines live in the south.

Greece's birds include herons, storks, and pelicans.

People

Ethnic Greeks make up more than 90 percent of the population. There are small numbers of Macedonians, Albanians, Turks, and others, but the Greek government does not view them as separate groups. Nearly all people speak modern Greek, a language similar to ancient Greek. Most Greeks belong to the Greek Orthodox church, which is a branch of Christianity. Muslims form a small religious minority. More than half of the population lives in cities.

Economy

Services—including tourism, shipping, and banking—are the main economic activities. Each year, Greece's natural beauty and ancient ruins draw more than 10 million tourists.



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Houses are built on top of lava rock in the city of Oia on the Greek island of Thera.

Facts About GREECE



Population
(2008 estimate)
11,239,000

Area
50,949 sq mi
(131,957 sq km)

Capital
Athens

Form of government
Republic

Major cities
Athens, Thessaloniki, Piraeus (Piraiévs), Pátrai, Peristéirion, Iráklion

Manufacturing is also important to the economy. Factories produce food and beverages, chemicals, machinery, clothing, petroleum products, and other goods. Mines provide bauxite, the raw material for making aluminum. Greece also has high-technology and telecommunications industries.

Agriculture forms a smaller part of the economy. However, Greece is known for making wine and olive oil from its grapes and olives. The grapes and olives, as well as oranges and lemons, grow in the warm coastal regions. Other crops include sugar beets, wheat, corn, tomatoes, cotton, and tobacco. The mountain regions are used mainly for herding sheep and goats. The

fishing industry also provides food for Greece.

History

Greece became part of the Byzantine Empire in the late 300s. (For the early history of Greece, read the article *Greece, Ancient*.) In 1453 the Turkish Ottoman Empire conquered Greece, along with the rest of the Byzantine Empire. The Greeks often revolted against Turkish rule. In 1821 they began a war of independence. Supported by Great Britain, France, and Russia, Greece declared its independence in 1829.

Unification

The new state did not include all of the territory of ancient Greece. During the 1800s and early 1900s Greece regained control over much of its historic land. In 1912–13 Greece fought alongside Serbia, Bulgaria, and Montenegro in the First Balkan War against Turkey. In 1913 Greece joined Serbia in the Second Balkan War against Bulgaria. As a result of the Balkan Wars, Greece regained control over Crete and much territory on the mainland.

Wars with Turkey

In 1917 Greece entered World War I on the side of the Allies. Turkey sided with the Germans. Fighting between Greece and Turkey continued long after the end of World War I in 1918. By 1919 Greece had won significant territory from Turkey, including the city of Smyrna. In 1921–22 Greece and Turkey fought another war. Turkey easily

defeated Greece and reclaimed much of the land that Greece had taken.

World War II and Civil War

In 1941, during World War II, Nazi Germany invaded Greece. The German army withdrew from Greece in 1944.

After World War II, civil war broke out in Greece between Communist and anti-Communist forces. Many Greeks supported the Communists, who had played a leading role in the war against Germany. Worried by the spread of Communism, the United States and Britain supported the anti-Communist forces. The anti-Communists won the war in 1949.

Postwar Greece

After the war, political problems made rebuilding difficult. In 1967 a group of army officers seized control of the country. The military government remained in power until 1974, when a democratic government was elected.



Greek women perform a folk dance.

That year Greece and Turkey nearly fought a war over control of the island of Cyprus.

During the late 20th and early 21st centuries Greece worked to improve relations with its neighbors. Athens hosted the Summer Olympics in 2004.

► More to explore

Athens • Cyprus • European Union
• Greece, Ancient



TIMELINE

The Ottoman Empire conquers Greece.

1453

Greece wins territory at the end of the Balkan Wars.

1913

Anti-Communists win the Greek civil war.

1949

Greece returns to democracy.

1974

Greece wins independence.

1829

Greece loses land to Turkey.

1922

The military takes over Greece's government.

1967

Greece, Ancient

The area that is now Greece was home to the first civilizations in Europe.

Ancient Greece had powerful cities, great thinkers called philosophers, and fine art. The idea of democracy—rule by the people—also came from ancient Greece.

Aegean Civilizations

Greek civilization began sometime after 3000 BC on the island of Crete. Crete lies south of Greece, on the southern border of the Aegean Sea. This first civilization is called the Minoan civilization.

In the 1500s BC Greek-speaking people developed another civilization on the Greek mainland. This civilization was called the Mycenaean civilization. The Mycenaeans conquered the Minoan capital between 1500 and 1400 BC. In about 1200 BC they probably fought a war against Troy, a city in Asia Minor (modern Turkey). Many Greek legends tell of this war, called the Trojan War.



Many remains from ancient Greece are still standing today. Three columns remain from a temple called the Tholos at Delphi. The temple was built in the early 300s BC.

Two great poems from ancient Greece tell of Mycenaean times. The poems, the *Iliad* and the *Odyssey*, were said to be the works of a man named Homer.

In about 1100 BC the Dorians, a people from the north, invaded. Mycenaean civilization came to an end. Many Mycenaeans moved across the Aegean Sea. They settled in Ionia in Asia Minor.

Greek Cities

The Dorians settled mostly in the western sections of Greece. The people in the eastern parts became known as Ionians. Together, the Dorians and the Ionians formed the civilization known as classical, or ancient, Greece. They built cities in most of what is now Greece.

By 800 BC the Greeks were building cities in new lands, too. Some went east to the Black Sea. Others settled in the west, on the island of Sicily and the mainland of Italy.

Most of the classical Greek cities, called city-states, were independent of each other. Athens and Sparta grew to be the most important city-states. Athens spread its influence by uniting all the surrounding villages. By contrast, Sparta sent armies to make slaves of its neighbors. By the 500s BC Sparta had the strongest army in Greece.

The Hellenes

Despite their differences, the Greeks came to think of themselves as one people. They called themselves the Hellenes.

The Hellenes shared a similar culture and spoke forms of the Greek language. They even invented the word barbarian to describe anyone who did not speak Greek.

The ancient Greeks believed in many gods. They pictured their gods as larger, more beautiful, and more powerful humans. These gods were said to live on Mount Olympus in northern Greece.

People often gathered together for festivals in ancient Greece. The most famous festival was the original Olympic Games, which began in about 776 BC.

Democracy and Culture in Athens

Powerful leaders ruled most of the city-states. Eventually, Athens took the first steps toward democracy. In 621 BC a ruler named Draco drew up a written code of laws. Then, in the last years of the 500s BC, another leader set up a

democratic government. All free men with Athenian parents were members of the city's lawmaking group. However, women, foreigners, and slaves were not included.

Athens also became the Greek center of literature and the arts. The philosophers Socrates, Plato, and Aristotle were great teachers there. Poets and playwrights wrote works that are still read and performed today. Painted pottery became a fine art and a great industry. Athenians built beautiful buildings and sculptures out of marble.

The Persian Wars

In the 500s BC the empire of Persia (modern Iran) took over the Greek cities in Ionia. In about 499 BC the city of Miletus started a rebellion against the Persians. Athens sent 20 ships to aid the Ionian Greeks, but the Persians crushed the revolt.



An ancient Greek mosaic shows the sea god Poseidon riding two dolphins. The mosaic was made from many small, flat colored stones.

Beginning in 490 BC the Persians attacked the Greek mainland several times. The Greeks fought back and finally defeated the Persians in 479 BC. After the Greek victory, Athens grew stronger.

The Peloponnesian War

By the 400s BC Athens controlled most of eastern Greece, many of the Aegean islands, and the Ionian coast in Asia Minor. The Spartans thought that Athens was too powerful. They began the Peloponnesian War against Athens in 431 BC.

At first, the Athenians avoided battle on land. They stayed within the walls of their city. Their navy attacked Sparta from the sea. The Athenians stayed safe until 430 BC, when plague (a deadly disease) broke out in the city. The disease killed one quarter of the people, including Pericles, their leader.

Sparta won the war in 404 BC. Sparta kept a leading position for only 30 years, however. In 371 BC another Greek city, called Thebes, defeated Sparta.

Rise of Macedonia

In the 300s BC Macedonia, a kingdom to the north, gained strength. The Macedonians were distantly related to the Greeks. The Macedonian king Philip II conquered the Greek city-states by 338 BC. When he died in 336, his son Alexander came to power.

Alexander, called Alexander the Great, was a military genius. First he defeated the Persian king Darius III in 333 BC.

Then he spent a decade conquering lands from Egypt to India. He took Greek civilization to much of the ancient world.

The Hellenistic Age



A sculpture from about 320 BC shows a young woman of the Hellenistic Age of ancient Greece.

Alexander died in 323 BC. The period following his death is called the Hellenistic Age. “Hellenistic” means “Greek-like.”

Alexander’s empire broke into three main kingdoms in Macedonia, Egypt, and the Middle East. In these kingdoms, Greek culture mixed with local cultures. In Greece itself, some of the cities regained their independence or joined together in leagues.

Ancient Rome conquered all of Greece and the three Hellenistic kingdoms by 30 BC. Greece remained under the

Did You Know?

One of the last of the Hellenistic rulers was Cleopatra, queen of Egypt.

Roman Empire until AD 395. Then it became a part of the Byzantine Empire.

► More to explore

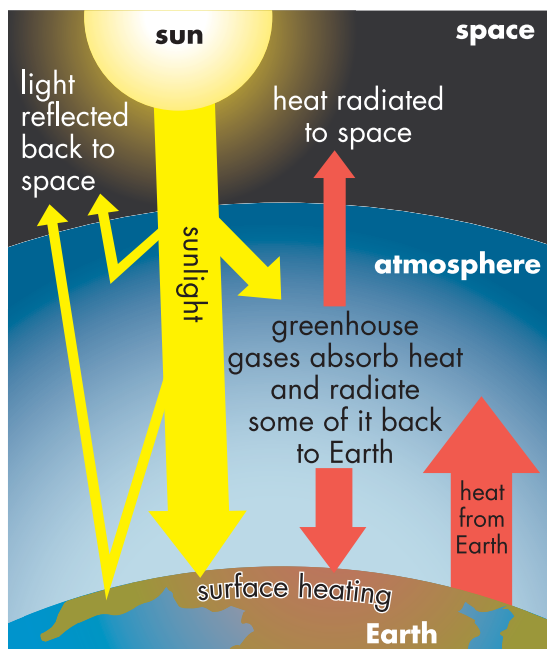
Aegean Civilization • Alexander the Great • Athens • Homer • Persian Wars • Sparta

Greek Orthodox Church

► see Eastern Orthodox Churches.

Greenhouse Effect

The greenhouse effect is a warming of Earth's surface and the air above it. It is caused by gases in the air that trap energy from the sun. These heat-



Energy from the sun heats Earth's surface and atmosphere. Greenhouse gases keep much of this heat from reflecting back into space.

trapping gases are called greenhouse gases. The most common greenhouse gases are water vapor, carbon dioxide, and methane. Without the greenhouse effect, Earth would be too cold for life to exist.

Land, oceans, and plants absorb, or soak up, energy from sunlight. They release some of this energy as heat. Greenhouse gases absorb the heat and then send it back toward Earth. Without greenhouse gases, this heat would escape back into space.

Scientists believe that human activities are increasing the greenhouse effect. When people drive a car or operate a factory they burn coal, oil, and other fossil fuels. This adds extra greenhouse gases to the air, and the extra gases trap more heat. Many scientists think that this has led to global warming, or a steady rise in the average temperature of Earth's surface.

► More to explore

Air • Earth • Fossil Fuel • Global Warming

Greenland

Greenland is the world's largest island. It lies in the very cold northern part of the world. Greenland belongs to Denmark. The capital and largest town is Nuuk.

Geography

Greenland is in the northern Atlantic Ocean. The northern tip is less than 500 miles (800 kilometers) from the North Pole. A massive ice sheet, or glacier, cov-

Did You Know?

Greenland never was very green. Erik the Red gave that name to the island because he wanted people to move there.



ers most of Greenland. At its deepest point the ice is 10,000 feet (3,000 meters) thick. Mountains run along the island's east and west coasts. The coast-line is indented in many places by narrow strips of sea, which are called fjords.

People

The people of Greenland are mostly of Inuit (Eskimo) origin. Many of them also have some European roots. Most of the rest of the people are Danish (from

Denmark). The main languages are Greenlandic (an Inuit language), Danish, and English. Almost everyone lives in small towns along the coast.

Economy

Greenland relies on financial aid from the Danish government. The island's economy also depends on fishing. The part of the land that is not covered in ice is used mainly to raise sheep and reindeer for meat, milk, and wool. In the north people hunt seals, polar bears, and foxes for their meat and skin.

History

The Inuit probably crossed from North America to northwestern Greenland between 4000 BC and AD 1000. In AD 986 Erik the Red, a Viking from Norway, started a colony on Greenland. The colony lasted until the 1400s. No other Europeans lived on Greenland until the 1700s. In 1721 the combined kingdom



Greenland does not have many roads. Many people travel by dogsled.

of Norway and Denmark started a new colony. After the union of Norway and Denmark ended in 1814, Denmark kept Greenland as a colony. In 1979 Denmark gave Greenland the power to govern itself. But Denmark kept control of Greenland's foreign relations.

► More to explore

Denmark • Eskimo • Glacier • Vikings

Green Revolution

Every year millions of people get sick or even die because they do not have enough to eat. Beginning in the 1940s scientists and governments started a movement called the Green Revolution to try to end this worldwide hunger. Its main goal was to end food shortages by improving agriculture, or farming.

Methods

The Green Revolution introduced new methods for growing, harvesting, and processing such crops as wheat, rice, corn, and potatoes. It brought modern machines and other technology to farming. As a result, farmers were able to produce more and better food.

Farmers in Mexico, India, Kenya, and many other countries began to grow new plant varieties created by scientists. They got larger crops as a result. Farmers also learned how to treat their crops with pesticides and fertilizers. These chemicals protected the plants from insect pests, weeds, and disease. Complex systems of irrigation, or watering,



U.S. scientist Norman Borlaug (standing at left) helped to start the Green Revolution. He explains new ways of growing wheat to farm leaders from all over the world.

also came into use. New machinery for plowing the soil and harvesting crops made farm work easier to do.

Mixed Results

Farmers still use the methods of the Green Revolution. One positive result of the movement was that many poor countries became able to grow enough food to feed their own people. This lowered the risk of famine, or a severe shortage of food.

However, the Green Revolution was not a complete success. Many of the pesticides and fertilizers were harmful to humans and polluted the land and water. Also, farmers had to buy the new seeds from other countries instead of using seeds from their own land. Finally, even though the movement produced more food, that food did not always reach the people who needed it.

► More to explore

Agriculture • Famine



Grenada

Grenada is a small island country in the eastern Caribbean Sea. Called the Isle of Spice, Grenada is known for growing nutmeg and other spices. The capital is Saint George's.

Geography

Grenada's territory includes the southern Grenadine Islands, which lie to the northwest of Grenada. (The northern Grenadines are part of the country of Saint Vincent and the Grenadines.) A ridge of mountains runs down the center of the island. Grenada has year-round warm weather and a long rainy season.

Plants and Animals

Rain forests of teak, mahogany, and other trees cover the mountains. Other plants include wild orchids and bamboo. Mona monkeys, agoutis (rabbit-sized rodents), mongooses, iguanas, land crabs, and rare leatherback turtles live on Grenada.



People

The majority of the population has black African or mixed African and European roots. There are also small groups of South Asians and whites. English is the main language. Most people are Christians, mainly Roman Catholics.

Economy

Grenada's economy depends on exports of nutmeg, fish, and cocoa. Grenada also grows sugarcane, coconuts, bananas, and other fruits and spices. Tourism is a very important industry.

History

The Arawak and later the Carib Indians were the earliest settlers of Grenada. In the 1600s the French took over the island and killed nearly all the Carib. The British captured Grenada in the 1700s. They brought slaves from Africa to work on sugarcane and spice plantations. The slaves were freed in 1833.

In 1974 Britain granted independence to Grenada. A dictator ruled until 1979, when a Communist party took over. In 1983 U.S. troops invaded Grenada and overthrew the Communist government. Grenada held democratic elections in 1984. In 2004 the island was seriously damaged by Hurricane Ivan.

► More to explore

Saint George's • Saint Vincent and the Grenadines

Facts About GRENADA



Population
(2008 estimate)
108,000

Area
133 sq mi (344 sq km)

Capital
Saint George's

Form of government
Constitutional monarchy

Major cities
Saint George's,
Gouyave, Grenville, Victoria

Gretzky, Wayne



Wayne Gretzky skates with the Canadian hockey team at the 1998 Winter Olympic Games.

Wayne Gretzky played ice hockey in the National Hockey League (NHL). Many people think he was the best player in the history of the game. When he retired he held more than 60 NHL records. His nickname was the Great One.

Wayne Douglas Gretzky was born on January 26, 1961, in Brantford, Ontario. He started playing hockey at a very young age. At age 6 he played against 10- and 11-year-olds. In 1978 Gretzky became the youngest player ever in professional hockey when he joined the World Hockey Association (WHA).

Gretzky first played in the NHL in the 1979–80 season. As center and team captain, he led the Edmonton Oilers to four Stanley Cup championships. Gretzky was named the league's most

valuable player eight years in a row, from the 1979–80 through 1986–87 seasons.

After the 1987–88 season Gretzky was traded to the Los Angeles Kings. In the 1989–90 season he broke Gordie Howe's NHL career record of 1,850 points (goals and assists). Howe needed 1,767 games to score that many points. Gretzky broke the record in only his 780th game.

Gretzky played the last three years of his career for the Saint Louis Blues and the New York Rangers. He retired in 1999. His career totals included 2,857 points, 894 goals, and 1,963 assists. The NHL honored him by retiring his jersey number (99) after his final game. That means that no other NHL player will ever wear the number 99. Gretzky was elected to the Hockey Hall of Fame in 1999.

► More to explore

Hockey, Ice

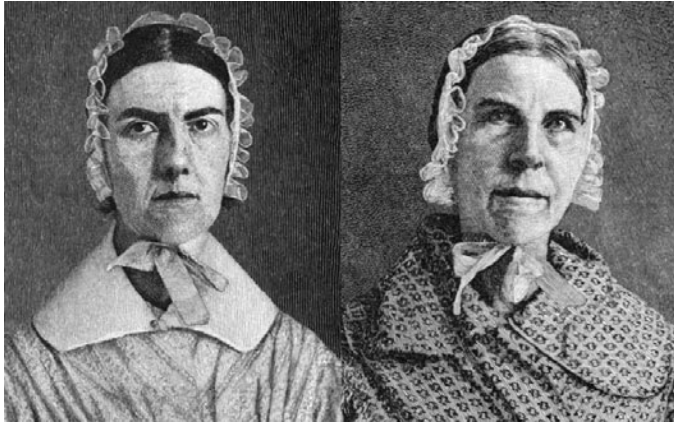
Did You Know?

Gretzky was nicknamed the Great One and the Great Gretzky.

Grimké, Sarah and Angelina

The sisters Sarah and Angelina Grimké were born to slaveholders in the southern United States. But they became leaders of the abolitionist movement, which worked to end slavery. They also supported women's rights.

The Grimké sisters were born in Charleston, South Carolina. Sarah was born on November 26, 1792. Angelina was born on February 20, 1805. As chil-



Angelina Grimké (left) and Sarah Grimké

dren they came to hate slavery. In the 1820s both sisters moved to the North.

Both Sarah and Angelina wrote powerful letters and articles. They asked Southern women and Southern churches to turn against slavery. This made them unpopular in the South. In the North, though, they spoke to large audiences. Some people said that it was not proper for women to speak in public. The Grimké sisters then began to speak out for women's rights.

The Grimké sisters lived to see the end of slavery in the 1860s. Sarah died on December 23, 1873, in Hyde Park, Massachusetts. Angelina died in Hyde Park on October 26, 1879.

► More to explore

Abolitionist Movement • Women's Rights

Grimm Brothers

The German brothers Jacob and Wilhelm Grimm collected some of the Western world's most popular stories.

They put together a famous book of folktales that has been published in at least 70 languages. The tales include such classics as "Snow White," "Rumpelstiltskin," "Rapunzel," "Cinderella," and "Little Red Riding Hood."

Jacob Ludwig Carl Grimm was born on January 4, 1785, in the German village of Hanau. Wilhelm Carl was born in Hanau on February 24, 1786. While in their 20s they began collecting folktales for a friend. The friend wanted to publish a collection of tales. The brothers wrote down tales that they heard storytellers tell out loud. The friend never used the tales, so the Grimms decided to publish them.

The Grimms sometimes changed the tales they heard. Sometimes they put their own views into the tales. Other times they combined several versions of a story into one.



Children follow the Pied Piper of Hamelin in a German illustration of the Grimm brothers' story.

The first volume of the tales was published in 1812. It was called *Children's and Household Tales*. Today the collection is commonly known as *Grimm's Fairy Tales*. The Grimms added to the collection for many years. Eventually it contained more than 200 tales.

Aside from collecting folktales, the Grimm brothers wrote books about the German language. They also worked for the government and as university professors and librarians. Wilhelm Grimm died on December 16, 1859, in Berlin, Germany. Jacob died there on September 20, 1863.

► More to explore

Folktale • Storytelling

Gros Ventre

The Gros Ventre are Native Americans of northern Montana. Early French traders gave them their name, which means “big belly” in French. The name refers to the way the tribe was identified in Indian sign language. The traders mistakenly used the name Gros Ventre for the Hidatsa people as well. To help tell the tribes apart, the Gros Ventre are sometimes called the Atsina or the Gros Ventre of the Prairie.

The Gros Ventre traditionally depended on hunting bison (buffalo). Their main food was bison meat. They used bison hides to make clothing and to cover their tepees.

The Gros Ventre once may have lived near the Great Lakes as part of the



A photograph from the early 1900s shows a band of Gros Ventre on horseback.

Arapaho tribe. By 1700, however, they had become a separate tribe. In the middle of the 1700s European traders began coming to Gros Ventre territory. The tribe then lived on the plains of what is now southern Canada. The traders brought with them diseases such as smallpox. The diseases killed many Gros Ventre.

By the middle of the 1800s the Gros Ventre had been pushed south into northern Montana. In 1888 the U.S. government moved the Gros Ventre to the Fort Belknap Reservation. Later they had to share the reservation with the Assiniboin, who were their traditional enemies.

At the end of the 20th century there were about 3,000 Gros Ventre. Many made their living through farming and ranching.

► More to explore

Arapaho • Assiniboin • Hidatsa • Native Americans

Groundhog

The groundhog is a large rodent that belongs to the squirrel family. It is also called the woodchuck. The groundhog's scientific name is *Marmota monax*.

The groundhog lives in the United States and Canada. It can be found in meadows and forests.

The groundhog weighs about 4 to 13 pounds (2 to 6 kilograms). Not counting its bushy tail, the groundhog is about 13 to 20 inches (33 to 51 centimeters) long. Its fur is brown or reddish brown. The groundhog has strong legs and heavy claws that are good for digging.

The groundhog lives in a burrow, or hole. It eats grass and other plants. During the winter the groundhog hibernates in its burrow. It hardly moves or eats for months.

In the United States and Canada, February 2 is Groundhog Day. On this day people watch as a groundhog comes out of its burrow. If the animal sees its



Groundhogs are good diggers. They spend a lot of time in the burrows that they dig.

shadow, it is said that winter will go on for six more weeks. If not, then spring is near.

► More to explore

Hibernation • Rodent • Squirrel

Guadeloupe

A group of islands in the Caribbean Sea, Guadeloupe is an overseas department (a type of province) of France. The two largest islands are Basse-Terre (to the west) and Grande-Terre (to the east).

Guadeloupe lies north of the island country of Dominica. Basse-Terre is mountainous, while Grande-Terre is flatter. Smaller islands called Marie-Galante, La Désirade, the Saintes Islands, and Saint-Barthélemy also belong to Guadeloupe. In addition, the northern part of the island of Saint Martin is a part of Guadeloupe. Guadeloupe has warm weather year-round and a rainy season. The islands are sometimes struck by hurricanes.

Forests of mahogany, chestnut, and ironwood trees cover much of Basse-Terre. Grande-Terre's forests have been cleared. The islands' warm waters are home to lobsters, octopuses, parrot fish, and rays. Iguanas, raccoons, rodents called agoutis, and a variety of birds live on land.

Most Guadeloupeans are Creoles, or people with both African and European ancestors. Blacks and people with mixed French and East Asian roots



A woman sells items in a market in the town of Marigot on Saint Martin island, Guadeloupe.

form smaller groups. French is the main language. Most people are Roman Catholics.

Guadeloupe depends on money and food from France. Many people work for the government. Tourism is another major industry. Guadeloupe produces bananas, sugar, rum, and cement.

The Carib Indians drove the Arawak Indians off the islands before Christopher Columbus arrived in 1493. French traders set up a colony in the 1600s. The French defeated the Carib and brought Africans to the islands as slaves.

In 1946 France changed Guadeloupe from a colony to a department. Guadeloupe has its own legislature as well as representatives in France's legislature.

► More to explore

Caribbean Sea

Guam

Guam is an island in the western Pacific Ocean. It is the largest and most populous island in the group called the Mariana Islands. Guam is a territory of the United States. It has important U.S. military bases.

Guam is a long, narrow island. The northern half is a plateau, or raised flat area, made of limestone. To the south are steep hills. Coral reefs and beaches line the shores. The weather is tropical.

The local people of Guam are called Chamorros. They are descendants of the island's early people, who came from Indonesia. The population also includes many Filipinos and other Asians, as well as U.S. military personnel and their families. Chamorro and English are the main languages. Most of the people are Roman Catholics.

U.S. military bases and tourism are the most important parts of Guam's economy.

People first arrived on Guam before 1500 BC. The first settlers probably were Indonesian. Europeans arrived on the island in the early 1500s. Spain claimed Guam in 1565. In 1898 the island was a battle site in the Spanish-American War. After the United States defeated Spain, Guam came under U.S. control. Today Guam governs itself, but it is still a U.S. territory.

► More to explore

Pacific Ocean • Spanish-American War

Did You Know?

The people of Guam are U.S. citizens, but they cannot vote in U.S. presidential elections.



Guatemala

The Central American country of Guatemala was the center of the great civilization of the Maya. Modern Guatemala has experienced unstable governments and much violence. The capital is Guatemala City.

Geography

Guatemala is bordered by Mexico, Belize, Honduras, and El Salvador. It has coasts on the Caribbean Sea and the Pacific Ocean. Along the Pacific in the south is a fertile coastal plain. North of the plain is a row of volcanoes. The volcano Tajumulco, at 13,845 feet (4,220 meters), is the highest peak in Central America. Mountains rise in the middle of the country. In northern Guatemala is the Petén, a heavily forested area with few people. It is known for its Mayan ruins.

The low-lying coastal regions and the Petén are hot year-round, but tempera-

tures are cooler at higher elevations.

Most of the country has a dry season, but the Caribbean coast receives rain all year.

Plants and Animals

The tropical rain forests of the Petén are rich in fine woods and rubber trees. This region also has savannas, or grasslands with some trees. Oak and pine forests grow in the mountains. Mangrove trees grow in swamps near the Pacific.

Guatemala's wildlife includes jaguars, monkeys, and parrots. The rain forests are home to the brightly colored quetzal, which is the national bird of Guatemala.

People

More than half of Guatemala's people are Ladinos, who usually have both American Indian and Spanish ancestors. Most of the rest of the people are Mayan Indians, who follow their traditional way of life. There are also small numbers of blacks and whites. Spanish is the official language, but many Indians speak their own languages. The majority of the people are Roman Catholics. Many Indians combine Roman Catholicism with traditional Mayan beliefs.

Nearly half of Guatemalans live in cities or towns. The largest city, Guatemala City, lies in the central mountains. Most of the rest of the major cities are near the Pacific coast.



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Economy

More than half of Guatemala's people work as farmers. The main food crops are corn, beans, and squashes. Commercial farms produce coffee, sugar, bananas, and livestock for export.

Manufacturing is another important part of the economy. Factories make food products, clothing and textiles, and metal goods. Guatemala also produces some petroleum (oil). Tourism is a growing industry.

History

The Maya developed an advanced civilization that spread through what are now Guatemala, southern Mexico, and northern Belize. Mayan culture reached its height between AD 250 and 900. In 1523 Spanish soldiers conquered the Maya. The Spanish forced the Indians to work on plantations and in mines. Many Indians died from European diseases.

Guatemala gained independence from Spain in 1821. Guatemala was part of the Mexican Empire until 1823. Guatemala then joined Honduras, El Salvador, Costa Rica, and Nicaragua in a union called the United Provinces of Central America. In 1839 Guatemala became an independent republic.

A series of dictators and military leaders ruled Guatemala for many years. Large landowners became wealthier while peasants became poorer. Beginning in the 1960s rebel groups attacked the government. More than 100,000 people died during the civil war, which ended in 1996. The military's control of politics also ended in the 1990s. Nevertheless, violence continued into the 21st century.

► More to explore

Central America • Guatemala City
• Maya



Mayan Indians sell fruits and vegetables in the large central plaza in the town of Chichicastenango, Guatemala.

Facts About GUATEMALA



Population
(2008 estimate)
13,002,000

Area
42,130 sq mi
(109,117 sq km)

Capital
Guatemala City

**Form of
government**
Republic

Major cities
Guatemala City,
Mixco, Villa
Nueva, Quetzal-
tenango,
Escuintla

Guatemala City



Population
(2002 estimate),
city, 942,300;
(2001 estimate),
metropolitan
area,
3,366,000

Guatemala City is the capital of the Central American country of Guatemala. It is the largest city in Central America.

Guatemala City is the center of culture and education in Guatemala. It is also the country's center of banking, business, industry, and transportation. Most of the country's manufacturing takes place in the Guatemala City area. Some factories in the city process oil. Other factories make tires, medicines, and fab-

rics. In addition, Guatemala City has an international airport.

In the 1500s Spain took control of Guatemala. For many years another city was the capital of Guatemala. In 1773 earthquakes nearly destroyed that city. Guatemala City was founded in 1776 to be the new capital.

Guatemala and other Central American colonies became free from Spanish rule in 1821. They joined together in a union. Guatemala City was the capital of the union. In 1839 Guatemala became an independent country with Guatemala City as its capital.

Earthquakes shook Guatemala City for six weeks in 1917 and 1918. Much of the city had to be rebuilt.

► More to explore

Guatemala



A cathedral towers above a public square in Guatemala City.

Guinea

The West African nation of Guinea has a largely poor, rural population. However, its rich mineral deposits could make it one of the wealthiest countries in the region. The capital is Conakry.

Geography

Guinea borders Guinea-Bissau, Senegal, Mali, Côte d'Ivoire, Liberia, and Sierra Leone. The Atlantic Ocean is to the west. The Fouta Djallon highlands cover much of central Guinea. West Africa's three major rivers—the Niger, the Gambia, and the Senegal—begin in the highlands. Guinea has a hot, humid climate with dry winters and wet summers.

Plants and Animals

Tropical rain forests of teak, mahogany, and ebony trees grow in the southeast. Grasses in northern Guinea may be 5 to 10 feet (1.5 to 3 meters) tall. Baboons, hyenas, and poisonous snakes are common.



People

Guinea's main ethnic groups are the Fulani, the Malinke, and the Susu. Each has its own language, though the official language is French. The majority of the people in Guinea are Muslims. Almost two thirds of the people live in rural areas.

Economy

Guinea's economy depends on agriculture and mining. Crops include cassava, rice, oil palm fruit, plantains, sugarcane, peanuts, and coffee. Guinea is one of the world's top producers of bauxite, which is used to make aluminum. Guinea also has reserves of iron ore, gold, and diamonds.

History

The Fulani dominated the Fouta Djallon region by the 1500s. By that time the Portuguese had already arrived on the coast. They developed the slave trade, which continued until the 1800s. By 1890 the French had made Guinea a colony. In 1895 it was made part of the colonial territory called French West Africa.

Guinea gained independence in 1958. The first president ruled as a brutal dictator. In 1984 the army took control of the government. Guinea held its first democratic elections in 1993. Military leaders were elected and remained in power into the 21st century.

► **More to explore**
Conakry



Facts About GUINEA



Population
(2008 estimate)
9,572,000

Area
94,919 sq mi
(245,836 sq km)

Capital
Conakry

Form of government
Republic

Major cities
Conakry, Kankan, Labé, Kindia, Nzérékoré, Kissidougou



Guinea-Bissau

The Republic of Guinea-Bissau lies on Africa's northwestern coast. It is one of the poorest countries in the world. The capital is Bissau.

Geography

Guinea-Bissau borders Senegal and Guinea. The Atlantic Ocean forms its western border. The country's territory includes the Bijagós Islands to the southwest. Guinea-Bissau has lowlands near the coast, a central plain, and highlands in the northeast. The climate is hot year-round, with heavy rainfall along the coast.

Plants and Animals

Mangroves and palm trees grow near the coast. The interior plain is heavily forested. The north is mainly savanna, or grassland with scattered trees. Wildlife includes crocodiles, snakes, gazelles, leopards, hyenas, apes, flamingos, and pelicans.

People

Guinea-Bissau's population includes about 20 ethnic groups. The largest are the Balante, the Fulani, the Mandyako, the Malinke, and the Pepel. Portuguese is the official language, but many people speak Crioulo, a mixture of Portuguese and African languages. Most of the people practice traditional religions or Islam. About one third of the people live in cities.

Economy

Guinea-Bissau's economy depends on farming. Crops include cashews, oil palm fruit, rice, cassava, sweet potatoes, coconuts, and cotton. Farmers also raise cattle, pigs, sheep, and goats. The main industries are wood and food processing, especially of fish. Cashews are Guinea-Bissau's most important export.

History

Farming peoples have lived in what is now Guinea-Bissau for more than 1,000 years. The Portuguese arrived in the 1440s and soon set up a slave trade. Portugal took control of the whole territory by 1915.

Guinea-Bissau won independence in 1974. During 1980–99 a military general ruled the country. In 1998 a civil war forced many people to leave. Political instability continued into the 21st century.

► More to explore

Bissau

Facts About GUINEA-BISSAU



Population
(2008 estimate)
1,503,000

Area
13,948 sq mi
(36,125 sq km)

Capital
Bissau

Form of government
Republic

Major cities
Bissau, Bafatá,
Cacheu, Gabú



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Guinea Pig



Some domestic guinea pigs are a combination of colors.

The domestic, or tamed, guinea pig is a small rodent that is popular as a pet. It is also used in medical research. Several other species, or types, of guinea pig live in the wild.

Guinea pigs have a stocky body, short ears, and no tail. They are about 8 to 16 inches (20 to 40 centimeters) long and weigh 1 to 3 pounds (0.5 to 1.5 kilograms). The front feet have four toes and the back feet have three. Each toe ends in a sharp claw.

Wild guinea pigs are found in South America. They live near forests and swamps and in grasslands and rocky places. They spend the day in underground holes called burrows. At night they come out to eat grass and leaves. They have long, rough gray or brown fur.

The domestic guinea pig can have long, short, silky, coarse, or smooth fur. It may be black, white, tan, cream, or

brown. Some have a combination of these colors. Like its wild relatives, the domestic guinea pig eats plants.

► More to explore

Pet • Rodent

Gulf of Mexico

► see Mexico, Gulf of.

Gull

The waterbirds called gulls can be found nearly all around the world. They are commonly heard screaming and seen swooping over the water at seacoasts and lakeshores. Gulls can fly, swim along the water surface, and walk well.

There are more than 40 species, or types, of gull, including kittiwakes. Gulls belong to the scientific family Laridae, along with terns. Terns are similar to gulls in many ways. However, terns tend to be smaller and more slender than gulls. Terns also have shorter legs, longer wings, and straighter bills.



A group of gulls flies through the air.

Adult gulls are usually white or gray, sometimes with dark markings. They range in length from about 11 to 31 inches (28 to 79 centimeters). Their long wings help them glide. Wing-spreads range from about 24 inches (61 centimeters) in the little gull to about 65 inches (165 centimeters) in the great black-backed gull. A gull's bill is strong and slightly hooked. Its webbed feet help it swim.

A gull's favorite food is fish. Gulls can land on the water to feed or rest. These birds also eat a great variety of other foods, including shellfish, insects, worms, mice, birds' eggs, dead and rotting animals, and even garbage.

► More to explore

Bird

Gutenberg, Johannes

In the 1400s Johannes Gutenberg of Germany invented a new method of printing. It used movable type—metal letters that could be arranged and rearranged to form words. It also used a machine called a press. His method was so good that very few improvements were made to it for 400 years afterward.

Gutenberg was born in Mainz, Germany, in the late 1300s. Little is known about his life. As a young man he learned how to work with metal.

In about 1430 Gutenberg moved to Strassburg (now Strasbourg, France).



Scholars call Johannes Gutenberg's printed Bible the 42-line Bible because each page has 42 lines of printing. It was completed by 1455.

There he tried out new printing methods. At that time most books were copied by hand. That was a slow process. He wanted to find a way to copy books more quickly using a machine.

The solution that Gutenberg found was movable type. Gutenberg made metal molds of each letter. He poured liquid metal into the molds. When the liquid hardened it formed pieces of type. He removed the pieces from the molds. He then then arranged the pieces of type to form words, sentences, and paragraphs. Gutenberg also developed a printing press to hold the type in place and press paper against it.

By 1450 Gutenberg had returned to Mainz. The most famous book he printed there was a Bible. It is sometimes called the Gutenberg Bible. He died in Mainz in 1468.

► More to explore

Printing

Did You Know?

After the Bible, Gutenberg's second most famous book was a Psalter, or a collection of sacred songs.

Guyana

The only English-speaking country in South America is Guyana. Its name, meaning “Land of Waters,” refers to its many rivers. The capital is Georgetown.

Geography

Guyana borders Venezuela, Brazil, and Suriname. The Atlantic Ocean lies to the northeast. A narrow, fertile plain extends along the coast. Forested highlands cover most of the land. Guyana’s main rivers flow from the south into the Atlantic. Guyana is close to the equator and has a rainy, warm climate.

Plants and Animals

Tropical trees fill the huge rain forests of Guyana. Along the coast are mangrove trees and saltwater grasses. The southwest is grassland dotted with palm trees.

Tapirs, jaguars, monkeys, sloths, anteaters, and macaws live in the rain forests. Giant anacondas, the largest snakes in the world, also live in Guyana.



People

East Indians, or the Indo-Guyanese, make up about half of the population. Blacks, or the Afro-Guyanese, form the next largest group. There are smaller groups of American Indians, Portuguese, and Chinese. Guyana’s main language is English. Christianity and Hinduism are the most common religions. Most people live in villages near the coast.

Economy

Guyana is a poor country with an economy based on farming and mining. Major crops include rice, sugarcane, coconuts, cassava, bananas, and pineapples. Mines provide bauxite (used to make aluminum), gold, and diamonds. Shrimp and timber are other important products.

History

Arawak and Carib Indians originally lived in the Guyana region. The Dutch set up sugarcane plantations in the 1600s. The British later bought the land. They formed the colony of British Guiana in 1831. When the colony’s African slaves were freed, the British brought in workers from India.

Guyana gained independence in 1966. Since then Guyana has argued with Venezuela and Suriname over its borders.

► **More to explore**
Georgetown



Facts About GUYANA



Population
(2008 estimate)
736,000

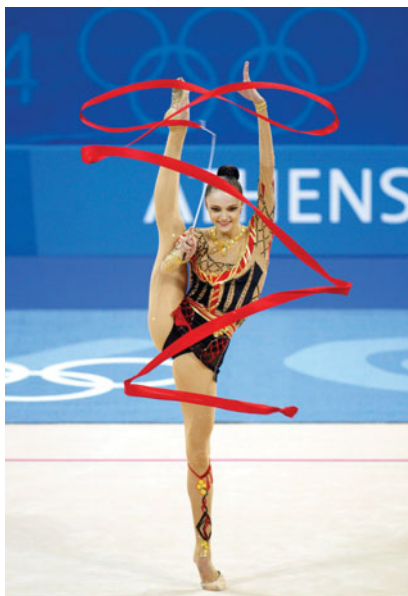
Area
83,044 sq mi
(215,083 sq km)

Capital
Georgetown

Form of government
Republic

Major cities
Georgetown, Linden, New Amsterdam, Corriverton

Gymnastics



A rhythmic gymnast performs with a ribbon.

The sport of gymnastics tests an athlete's strength, grace, and body control. Gymnasts perform such acrobatic feats as somersaults, backflips, handstands, and cartwheels. Almost all gymnastic events are performed on special equipment, such as rings or bars. This equipment is called apparatus.

Gymnastics is a very popular sport at the Summer Olympic Games. Three types of gymnastic events are held at the Olympics. They are called artistic gymnastics, rhythmic gymnastics, and trampoline.

Artistic Gymnastics

Artistic gymnastics consists of six men's events and four women's events. The men's events are floor exercise, pommel horse, rings, vault, parallel bars, and horizontal bar. The women's events are floor exercise, vault, uneven bars, and balance beam.

Men's Events

The floor exercise is performed on a square, padded mat. The gymnast does acrobatic feats while moving around the mat. The feats include tumbling, leaps, and handstands.

The pommel horse is an apparatus that looks something like a horse's midsection. It has two curved handles, called pommels, on top. Gymnasts grip the pommels with their hands. They move their bodies, especially the legs, constantly around the pommel horse.

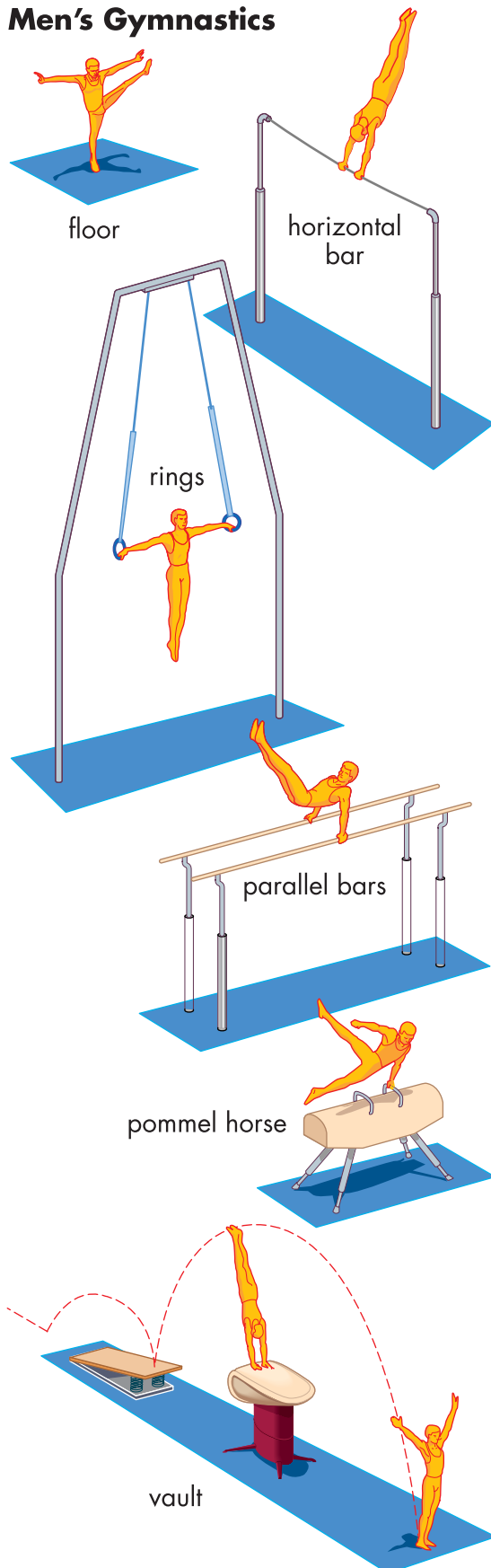
The rings (or still rings) are an apparatus made up of two small circles. The rings are attached to straps hanging from an overhead support. While grasping the rings, the gymnast performs a routine in midair. The routine combines swinging movements and the holding of certain positions.

In the event called the vault, the gymnast leaps over an apparatus called a vaulting table. A springboard is placed at one end of the vaulting table. The gymnast takes a running start and jumps off the springboard. Then the gymnast pushes off the vaulting table with the hands. Before landing, the gymnast performs such acrobatic feats as twists or cartwheels.

The parallel bars are two long bars raised 6.5 feet (2 meters) above the floor. A routine on the bars includes swings, handstands, and other feats.

The event called the horizontal bar (or high bar) has the gymnast perform on a

Men's Gymnastics



single bar. The gymnast performs acrobatic moves while swinging above and below the bar.

Women's Events

The women's floor exercise and vault are similar to the men's events. However, women gymnasts perform their floor exercise to music. The women's event highlights grace more than strength.

The women's competition called the uneven parallel bars is something like the men's parallel bar event. In the women's event, however, the two bars are not set at the same height. During the routine the gymnast swings from bar to bar.

The balance beam is a wooden beam that is only 4 inches (10 centimeters) wide. It is 4.1 feet (1.25 meters) above the floor. While balancing on the beam, the gymnast performs jumps, turns, flips, and other moves.

Rhythmic Gymnastics

Rhythmic gymnastics is a blend of ballet, acrobatics, and juggling. At the Olympics it is held for women only. The gymnasts perform to music while holding such items as ropes, hoops, balls, clubs, or ribbons. The gymnasts must display rhythm, grace, and flexibility.

Trampoline

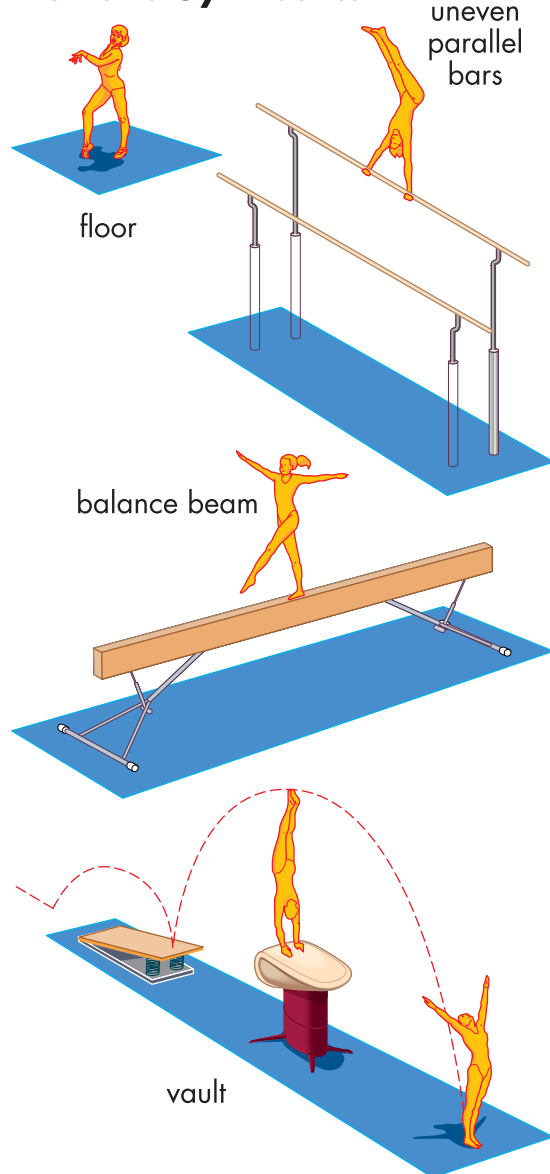
A trampoline is a mat of stretchable material on a metal frame. Springs

Men's gymnastics events are floor exercise, horizontal bar, rings, parallel bars, pommel horse, and vault.

Did You Know?

The term gymnastics comes from the Greek word meaning "to exercise naked." In ancient Greece male athletes exercised unclothed in a gymnasium.

Women's Gymnastics



Women's gymnastics events are floor exercise, uneven parallel bars, balance beam, and vault.

attach the mat to the frame. Gymnasts bounce up and down on the trampoline. While in the air they perform acrobatic moves. At the Olympics the trampoline competition is held only for individuals, not teams. There are men's and women's trampoline events.

► **More to explore**
Olympic Games

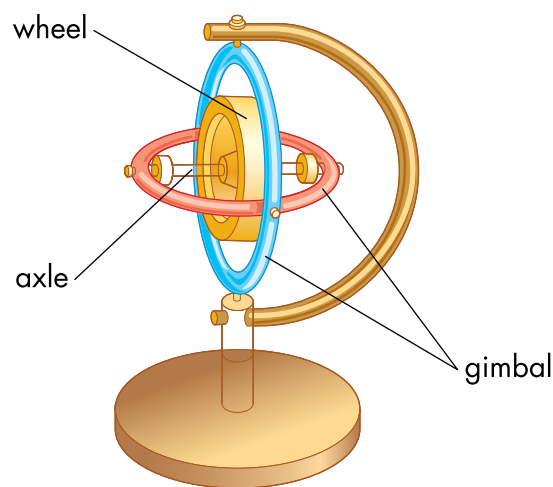
Gypsy

► see Rom.

Gyroscope

A gyroscope is a device that can be used to tell when a moving object has changed direction. Gyroscopes are most useful in navigation. They help keep aircraft and ships on a steady course. The oldest type of gyroscope is a mechanical device. It has a wheel that spins in a special frame.

When a wheel spins, it has a kind of energy called angular momentum. This means that it will keep spinning in the same direction as long as it is spinning fast enough. The gyroscope's frame allows the wheel to keep spinning in the same direction even when the frame is moved. If the frame is attached to an object, such as a boat, sensors on the frame can tell when the object has changed direction. Other gyroscopes use beams of light instead of a wheel.



A mechanical gyroscope has a wheel set in a special frame. The frame includes a rod called an axle and two rings called gimbals.

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Hair is made of the same material as horns and nails.

(See Hair.)

The human hand has more than 27 bones.

(See Hand.)

The Jewish holiday called Hanukkah is also called the Festival of Lights.

(See Hanukkah.)

Some people keep hedgehogs as pets.

(See Hedgehog.)

A helicopter can fly straight up and down, sideways, or backward. It can also spin around or hover in the air.

(See Helicopter.)

Miguel Hidalgo y Costilla is known as the Father of Mexican Independence.

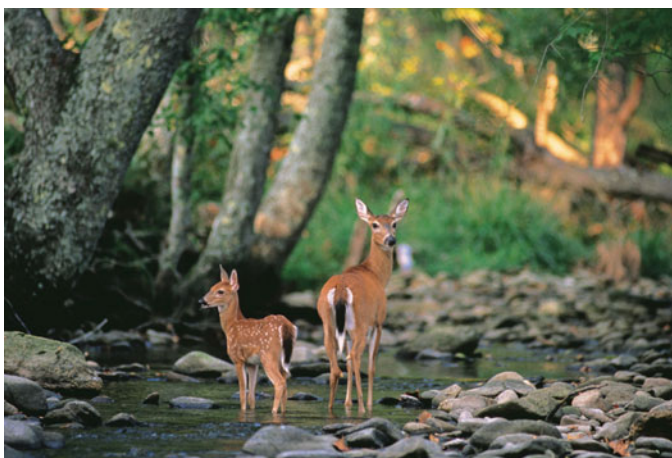
(See Hidalgo y Costilla, Miguel.)

Habitat

A habitat is the home of an animal or a plant. Almost every place on Earth—from the hottest desert to the coldest ice pack—is a habitat for some kinds of animals and plants. Most habitats include a community of animals and plants along with water, oxygen, soil or sand, and rocks. This community is known as an ecosystem.

Types of Habitats

The two main types of habitats are land habitats and water habitats. Among the many types of land habitats are rain forests, deserts, and mountains. Because of their moist climate, rain forests support more kinds of plant and animal life than any other habitat. In contrast, deserts support only animals and plants that can live without much water. Mountain habitats have thin soil and cold temperatures. Only hardy plants and animals live there. Other types of forests, grasslands, and tundras provide other land habitats.



A deer and her fawn stand in a forest. Forests provide habitats for many living things.

Water habitats may contain freshwater or salt water. Freshwater habitats include streams, rivers, swamps, marshes, ponds, and lakes. Saltwater habitats include oceans, seas, salt lakes, salt marshes, and saltwater swamps. Some animals and plants, such as fish and seaweed, live entirely in the water. Others, such as otters and riverweeds, live partly in and partly out of the water.

Adaptation

Over long periods of time animals adapt to fit their habitat. This means that they develop traits that help them to survive where they live. Animals adapt so that they can stay safe, travel well, and find food in their habitat.

Many animals that live in cold habitats grow thick coats of fur to keep them warm. Their fur may also be white so that their enemies cannot see them when the ground is covered with snow. The hard shell of the desert tortoise keeps in moisture and protects it from enemies. Dolphins have sleek bodies for swimming in the ocean. Giraffes have long necks so that they can nibble tender leaves from the tops of trees.

► More to explore

Adaptation • Ecosystem

Hades

In ancient Greek mythology Hades was the god of the underworld, or land of the dead. He was one of the 12 main gods of Mount Olympus. The ancient Greeks also called him Pluto, which was his Roman name. Once people died and



In ancient Greek mythology the god Hades ruled the land of the dead. He kidnapped Persephone and made her his wife.

went to the underworld, they could not leave. For this reason Hades was often pictured holding a key. This represented his role as jailer of the dead.

According to legend, Hades was the son of Cronus and Rhea, king and queen of the Titans. The Titans were giants who ruled the world. Hades' brothers were the gods Poseidon and Zeus. The three brothers fought and won a long war against the Titans. The brothers then drew lots to decide how to divide up the world. Hades won command of the underworld.

The most famous story about Hades explains the change of seasons. Hades carried Persephone off to the underworld. She was the daughter of Demeter, the goddess of farming. Eventually, Persephone was able to leave the underworld. But she had to return there for part of every year. Demeter would not let anything grow when Persephone was away. This created winter.

► More to explore

Mythology • Poseidon • Zeus

Hague, The



Population
(2008
estimate), urban
area, 997,323

Amsterdam is the official capital of The Netherlands. But the country's government and court meet in a city called The Hague. The International Court of Jus-



The Peace Palace is located in The Hague. It is the home of the International Court of Justice.

tice is also located in The Hague. It is the highest court of the United Nations. The Dutch royal family has a palace in The Hague as well.

The Hague is mainly a center of government and business headquarters. Trade, banking, and insurance are also important to the city's economy.

The Hague grew around a castle built in 1248. The castle buildings were home to the counts of the region called Holland. The government of Holland began meeting in the buildings in the late 1500s.

The region came under French rule in the late 1700s. The Netherlands became an independent country in 1815. Its government offices were then moved from The Hague to Amsterdam, the new capital. The government returned to The Hague in 1913.

During World War II (1939–45) German forces destroyed whole sections of

the city. The damaged areas were rebuilt after the war.

► More to explore

Amsterdam • Netherlands, The • United Nations

Haida

The Haida are a tribe of Native Americans who traditionally lived on the Queen Charlotte Islands off the coast of what is now British Columbia in Canada. In the early 1700s a small group of Haida moved to Prince of Wales Island in what is now Alaska.

The Haida were skilled in woodworking. They carved ceremonial masks and chests. They also made redwood canoes that they traded to other tribes. The Haida lived in large rectangular houses that they built from cedar planks. They



The Haida were excellent woodcarvers. They sometimes decorated their carvings with paint and seashells.

fished and hunted seals, sea lions, black bears, and deer for food.

In the late 1700s traders from Spain, England, Russia, and France began setting up posts in Haida territory. The Haida traded skins and furs in exchange for knives, metal pots, and other European goods. But the Europeans also brought diseases, such as smallpox, that killed many Haida. In addition, the Canadian and U.S. governments and Christian missionaries forced the Haida to give up some of their traditions.

In the early 21st century there were about 5,000 Haida. Some live in Canada and some live in the United States. The Canadian Haida live in two villages, Masset and Skidegate. Many of the Haida in the United States live in Hydaburg, a city at the southern end of Prince of Wales Island.

► More to explore

Native Americans

Hair

Hair is a thin, flexible structure that grows from the skin of every mammal. Like horns and nails, hair is made mainly of a protein called keratin.

Individual hairs have a shaft and a root. The shaft sticks out of the skin's surface. This part of the hair is dead. The root lies beneath the skin's surface in a pit known as a follicle. At the base of the root are living cells. As these cells multiply, they push old cells out of the skin. This is how hair grows.



The long hair on a horse's head is called a mane.

Hair growth varies widely among mammals. Many mammals, such as dogs and horses, have a coat of hair that covers most of the body. When the coat is thick and soft, as in rabbits, it is known as fur. Whales and hippopotamuses have only a few hairs.

Humans have less hair than most mammals. Usually, most of the hair on a human body grows from the scalp.

One of the main purposes of hair is to keep an animal warm. It also helps to keep moisture away from the skin. Whiskers are a type of hair that helps animals to feel things.

People make cloth from the hair of sheep, goats, camels, and other animals. They use the fur of mink, foxes, rabbits, and other animals to make coats and hats.

► More to explore

Horn • Mammal • Nail and Claw • Skin

Did You Know?

People have about 100,000 to 150,000 hairs on their head.





Haiti

The Republic of Haiti is the only independent French-speaking country in the Americas. Haiti gained independence in 1804 after its slaves revolted against their French masters. The capital and largest city is Port-au-Prince.

Geography

Haiti occupies the western third of the island of Hispaniola in the West Indies. The Dominican Republic covers the rest of Hispaniola. The Atlantic Ocean is to the north, and the Caribbean Sea is to the west and south.

The land is mountainous. At 8,773 feet (2,674 meters), Mount la Selle in the south is Haiti's highest point. Between the mountains are fertile plains. The Artibonite is the longest of Haiti's many rivers. Haiti has a warm, humid tropical climate. Droughts happen occasionally, and hurricanes are common between August and November.



A Haitian man sells paintings of Haitian scenes.

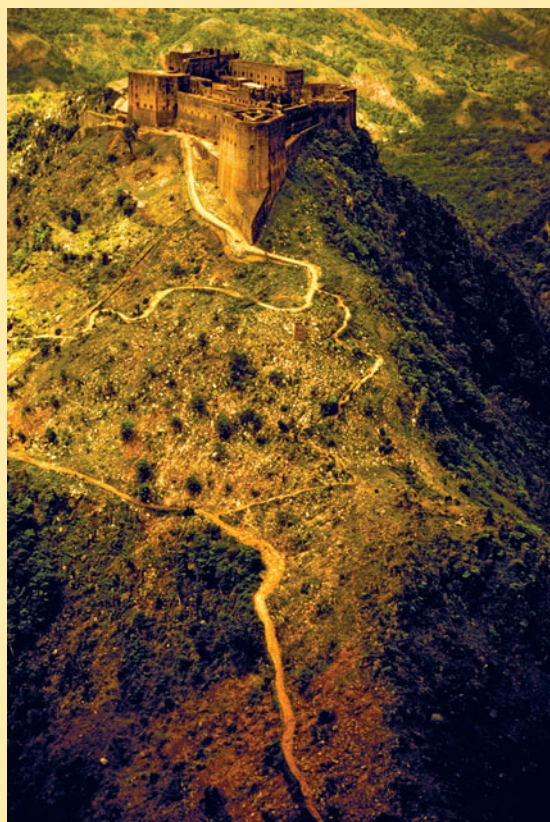
Plants and Animals

Most of Haiti's original forests have been cut down. Some evergreen forests still exist in the mountains. Coconut, coffee, cacao, avocado, mango, lime, and orange trees grow wild. Dry areas have thorny scrub and cacti.

Haiti's wildlife is also limited. It includes flamingos and such reptiles as lizards and caimans, which are similar to alligators.

People

Nearly all the people of Haiti have African roots. Most of the rest of the people are mulattoes, or people with both white and black ancestors. Most people speak Haitian Creole, a mixture of French and African languages. French is also common. Most Haitians are Roman Catholics, but many Catholics also practice voodoo. Voodoo is a folk religion that combines African and Catholic beliefs.



A fortress called La Citadelle Laferrière stands on a peak near the city of Cap-Haïtien, Haiti. The fortress was built in the early 1800s.

The majority of Haitians live in rural areas. Haiti's cities are very crowded, however.

Economy

Haiti is the poorest country in the Americas. About 80 percent of the people live in poverty.

Services—including government work, tourism, shops, and restaurants—are the main economic activities. However, most people work in agriculture. Haitians raise goats, cattle, and pigs. Food crops include cassava, bananas, corn, yams, and rice. Cocoa, coffee, and mangoes are exported.

Many of Haiti's industries put together parts imported from the United States. They produce such goods as clothing and electronic components. Other manufactured products include flour, sugar, cement, cigarettes, and alcoholic beverages.

History

When the explorer Christopher Columbus arrived in Hispaniola in 1492, more than a million Arawak Indians lived on the island. Spanish settlers wiped out the Arawak by about 1600.

In 1697 Spain gave western Hispaniola to the French, who renamed it Saint-Domingue. People brought from Africa worked as slaves on sugar and cotton plantations. In 1791 the slaves began a revolution. They declared the independence of Haiti in 1804. The new country's name came from an Arawak word meaning "mountainous land."

As an independent country Haiti continued to face political problems. U.S. Marines occupied the country during 1915–34. Dictators and the military also ruled Haiti. The country held its first free presidential elections in 1990. In 1991, however, a military group overthrew President Jean-Bertrand Aristide. U.S. troops helped Aristide to return to office. In 2004, during Aristide's second term, rebels forced the president to step down once again.

► More to explore

Dominican Republic • Port-au-Prince
• West Indies

Facts About HAITI



Population
(2008 estimate)
9,751,000

Area
10,695 sq mi
(27,700 sq km)

Capital
Port-au-Prince

Form of government
Interim government

Major cities
Port-au-Prince,
Carrefour, Delmas,
Cap-Haïtien,
Pétion-Ville

Halloween

Halloween takes place on October 31. It is a time when people dress up in costumes, go trick-or-treating, and carve jack-o'-lanterns from hollowed out pumpkins. Ghosts and witches are popular costumes of the children who go from house to house saying, "Trick-or-treat!" The treat is usually candy. The origins of Halloween date back to several ancient festivals held in the autumn.

In ancient times, the holiday was marked by customs started by pagans. Pagans believed in many gods rather than a single god. It was believed that on the last night of October, the spirits of the dead roamed Earth. The holiday is also called All Hallows' Eve. In the Christian church, All Hallows' Eve is the night before All Saints' Day. On November 1, All Saints' Day honors all of the Christian saints. Gradually, Halloween became a nonreligious celebration.



Children in colorful costumes go trick-or-treating on Halloween.

Hamilton, Alexander



Alexander Hamilton

Alexander Hamilton was one of the youngest and brightest of the founders of the United States. He was the first secretary of the treasury. He worked to create a strong U.S. government.

Early Life

Hamilton was born on January 11, probably in 1755, in the British West Indies. He later went to school in New Jersey and New York. During the American Revolution Hamilton joined the military. From 1777 to 1781 he served with General George Washington. After the war Hamilton became a lawyer.

Political Career

Hamilton believed that the United States needed a strong national government. He supported the new U.S. Constitution because it set up such a government. Hamilton, James Madison,

and John Jay wrote a famous series of essays to explain the Constitution. Those essays were later called the Federalist papers.

In 1789 George Washington, now U.S. president, made Hamilton secretary of the treasury. Hamilton planned for a tax system and a national bank. His financial program strengthened the national government.

Thomas Jefferson, the secretary of state, disagreed with Hamilton. He believed that the states should have more power. The two men and their supporters started the first U.S. political parties. Hamilton led the Federalist Party, while Jefferson led the Republican Party.

Retirement

Hamilton resigned as secretary of the treasury in 1795. He stayed active in politics, however. Hamilton got involved in the presidential election of 1800. Jefferson and Aaron Burr were two of the main candidates. Hamilton and Burr did not like each other. Hamilton set aside his quarrel with Jefferson and helped him get elected.

In 1804 Hamilton supported Burr's opponent in the election for governor of New York. Angered once again, Burr challenged Hamilton to a duel. Burr shot Hamilton on July 11, 1804. Hamilton died the next day.

► More to explore

Federalist Papers • Jefferson, Thomas
• United States Government

Hamster

Hamsters are small mammals that belong to the rodent family. Like mice, squirrels, beavers, and other rodents, they have large front teeth that they use for gnawing and nibbling. Hamsters are among the few animals born with developed teeth.

In the wild, hamsters live in dry areas in central Europe, the Middle East, and Asia. For shelter, hamsters dig burrows, or underground tunnel systems. They use these burrows for sleeping and for storing food.

Today many people in every part of the world keep hamsters as pets. The most common species, or type, of hamster kept as a pet is the golden hamster. Golden hamsters originally came from Syria.

Hamsters have a plump body and a short tail. Golden hamsters have yellowish or reddish brown fur and white bel-



Golden hamsters are popular pets. People often keep them in small cages.

lies. Other types of hamster have gray or black fur. Most adult hamsters weigh about 5 ounces (150 grams). They have poor eyesight but good senses of smell and hearing. Hamsters have large pouches in their cheeks to carry food.

Hamsters are nocturnal, or active at night. They sleep during the day. Hamsters eat almost anything, especially seeds and grains.

Most hamsters live for about three years. They begin having babies at about 2 months old. Female hamsters may have a new litter of babies every month. A litter may have one to 13 babies.

► More to explore

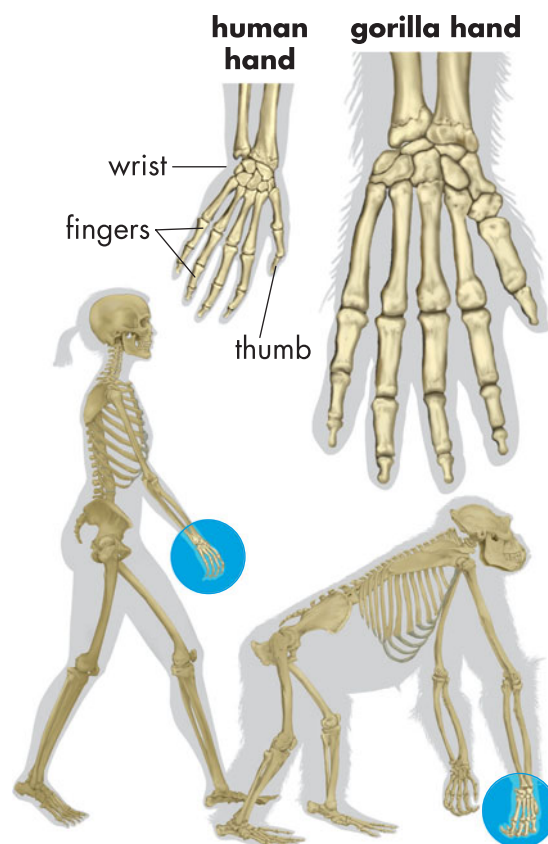
Pet • Rodent

Hand

The hand is a part of the body that extends from the end of each arm. Hands are a feature of most primates, including humans, apes, and monkeys. The hand has a flat, wide palm. It also has five parts called digits—a thumb and four fingers. Bones and muscles inside the hand allow the digits to move in many useful ways.

Structure

The human hand contains 27 main bones. Each finger has three bones. The thumb has two. The palm of the hand has five bones. The wrist, which attaches the hand to the arm, has eight bones. There are also some small bones near the base of the digits.



The hand of a human and the hand of a gorilla are similar in shape. However, a gorilla's hand is much larger and is also used for walking.

The four fingers extend upward from the palm. The thumb extends from the side of the palm. The tip of each digit has a nail. Each digit also has a unique pattern of ridges called a fingerprint.

Different muscles control the movement of each digit. All five digits can fold inward. The thumb can move to a position opposite the fingers. This so-called opposable thumb is the mark of a true hand. Animals with paws do not have opposable thumbs.

Function

Hands can push, pull, pat, scoop, and carry. They can wave, point, and make

Did You Know?

Because human fingerprints are unique to each person, they are used for identification.

many other gestures, or signs. With the opposable thumb, a hand can pick up small objects and handle tools.

Hands are also important for their sense of touch. They are very sensitive to different textures and temperatures. Their creases and ridges help them to feel and to hold things.

Hands in Apes and Monkeys

Like humans, apes and monkeys have opposable thumbs. They use their hands to pick things up, gather food, and groom each other. Many apes and monkeys also use their hands for climbing and swinging. In some species, or types, the fingers are extra long. These long fingers help them to grip tree branches.

► More to explore

Arm • Nail and Claw • Primate

Hanoi



Population
(2004 estimate)
1,420,400

Hanoi is the capital of Vietnam, a country of Southeast Asia. It is a large city located on the Red River. The city is unusual in that it has many lakes.

Modern Hanoi is a mix of new and historical buildings. One important struc-



Hanoi has many historical and scenic places, including buildings called pagodas. Pagodas are a feature of many Buddhist temples.

ture is the tomb of Ho Chi Minh. Ho was a powerful Vietnamese leader.

Factories in Hanoi make food products, electrical machinery, cloth, and other goods. The city's economy also depends on tourism and other services.

People have lived in the Hanoi area since ancient times. The city has long been a center of government. It was the capital of Vietnam from 1010 until 1802. French troops took over Vietnam in the late 1800s. In 1902 the French made Hanoi the capital of all their colonies in Southeast Asia.

The French left Vietnam in 1954. Vietnam was then split into two parts—North Vietnam and South Vietnam. Hanoi was the capital of North Vietnam. The two parts of Vietnam fought the long Vietnam War. The United States helped South Vietnam. Hanoi suffered great damage from U.S. bombing. The war lasted until 1975.

In 1976 the two parts of Vietnam again formed one unified country. Hanoi became the capital of all of Vietnam.

► **More to explore**

Vietnam • Vietnam War

Hansberry, Lorraine

Lorraine Hansberry was a U.S. writer in the mid-1900s. In 1959 her play *A Raisin in the Sun* opened on Broadway, an important theater district in New York City. It was the first play written by an African American woman to appear on Broadway.

Lorraine Hansberry was born in Chicago, Illinois, on May 19, 1930. Lorraine's parents fought for equality for African Americans. At the time, African



Lorraine Hansberry

Americans did not have the same rights as whites did.

After going to college at the University of Wisconsin, Hansberry moved to New York City. She began her writing career in New York. She was an editor and writer for a magazine called *Freedom*.

A Raisin in the Sun was the first play Hansberry wrote. It is about an African American family living in Chicago and dealing with racism. The play won several awards and was made into a movie in 1961.

Hansberry went on to write another play and other works. She died from cancer on January 12, 1965. After her death, her ex-husband took some of her writings and created a play. This play, called *To Be Young, Gifted, and Black*, was produced in 1969.

► **More to explore**

African Americans • Theater

Hanukkah

Hanukkah (also spelled Chanukah or Chanukkah) is a Jewish holiday that lasts for eight nights and usually occurs in December. It is also known as the Festival of Lights.

Hanukkah celebrates a military victory of the Jews over foreign rulers. The Seleucid kingdom from neighboring Syria took control of Jerusalem in about 198 BC. Some 30 years later the ruler Antiochus tried to force the Jews to give up their religious practices. When he



The most important custom during Hanukkah is the lighting of the menorah. A blessing is usually offered as the candles are lit.

also took over their Temple they rose up against him. The leader of the rebellion was named Judas Maccabeus. He soon defeated the Seleucids. The Jews then cleaned, rebuilt, and rededicated the Temple in 164 BC.

According to tradition, the Jews found only one small jar of lamp oil when they entered the Temple, enough for just one night. With the oil, they relit the Temple's lamps. Miraculously, the oil lasted for eight nights until more oil was obtained.

To celebrate the eight nights of Hanukkah people light candles on a branched candlestick called a menorah. They start with one candle and add a new candle each night. In addition, children receive gifts and money, which is often in the form of chocolate coins. Children also play a Hanukkah game with a four-sided top called a dreidel.

► More to explore

Festival and Holiday • Judaism

Hapsburgs

The Hapsburgs (or Habsburgs) were a royal German family that ruled Austria from the late 1200s until 1918. They ruled many other countries of Europe for shorter times. Those countries included Bohemia (now part of the Czech Republic), Hungary, and Spain. The family's name comes from the Castle of Hapsburg, or Hawk's Castle, in what is now Switzerland. Ancestors of the family built the castle in 1020.

Rise

The first Hapsburg ruler was Rudolf I. He was crowned king of Germany in 1273. A few years later Rudolf took control of Austria. From then on Austria was the center of Hapsburg power.

Frederick V was crowned emperor of the Holy Roman Empire in 1452. Then he was called Frederick III. The Holy Roman Empire included much of western and central Europe. Between 1452



A painting shows Rudolph I, a Hapsburg, riding into a city. The Hapsburgs began ruling Germany in 1273.

and 1806, all but one of the Holy Roman emperors were Hapsburgs.

A World Power

The power of the Hapsburgs was at its greatest in the 1500s under Charles V. Charles was Holy Roman emperor and the king of Spain. His lands included all of Europe except for England, France, and Russia. Across the Atlantic Ocean, Charles's armies conquered rich empires in Mexico and Peru.

Before his death, Charles divided his lands between his brother and his son. This created two Hapsburg branches. One branch ruled Spain until 1700. The other branch ruled the rest of the empire. Beginning in 1804 the land ruled by the Hapsburgs was called the Austrian Empire. In 1806 the Hapsburg emperor gave up the title of Holy Roman emperor.

Slide from Greatness

During the 1800s some national groups within the Austrian Empire wanted to be independent. Among these groups were the Hungarians. To satisfy them, the Hapsburg emperor divided his empire with Hungary in 1867. The new empire was called Austria-Hungary.

Austria-Hungary was on the losing side during World War I. When the war ended in 1918, the empire collapsed. Hapsburg rule was over.

► More to explore

Austria • Holy Roman Empire

Harare



Population
(2002 estimate)
1,444,500

Harare is the capital of Zimbabwe, a country of southern Africa. It is the largest city in the country.

Harare is Zimbabwe's center of business, banking, and industry. Factories in the city make processed foods, clothing, and metal products. Crops grown on nearby farms are traded in Harare. The crops are then shipped out on trains or trucks.

African peoples have lived in the Harare area for thousands of years. In 1890 a British trading company captured a village of the Shona people. The British company founded a new city, named Salisbury, there. The city grew rapidly as a center of trade and mining.



A bank building towers over a street in Harare.

In 1923 Salisbury became the capital of the new British colony of Southern Rhodesia. The city remained the capital through many years of changes. In 1980 the independent country of Zimbabwe was formed. Salisbury was its capital. In 1982 the name of the city was changed to Harare.

► More to explore

Zimbabwe

Harbor

A harbor is a deep body of water that protects boats near land. High waves and strong currents usually do not reach harbors, so boats stay safe while anchored there. Some harbors are created by surrounding land, which keeps the water calm. They are called natural harbors. Artificial, or man-made, harbors are created by structures called seawalls or breakwaters.

Where Harbors Are Found

Harbors are found along coasts around the world. Harbors are always part of a larger body of water—for example, a lake or an ocean. Coastlines that curve inward make good places for natural harbors. This type of coastline is often called a bay. Barrier islands, which run along a coast, also create natural harbors. For example, New York Harbor lies between the coast of New York and Long Island.

Harbor Uses

Harbors are useful for many purposes. Many harbors are used as ports. The main purpose of a port is the loading and unloading of boats. People ship goods of all kinds to and from the ports of the world. People also travel by boat to and from these ports. For these reasons some of the world's major cities grew around busy ports. A lively shipping trade brings much money to the city where the port is located.

Harbors are not just for big shipping vessels and cruise ships. Ferryboats dock in harbors to pick up passengers for short journeys. For example, ferries bring people to nearby islands and back. People anchor small sailboats, yachts, and speedboats in harbors, too. From there they can take their boats out into the lake or the ocean for fishing, water-skiing, and other fun. Harbors also provide homes for many kinds of birds and fish.

► More to explore

Boat • Ship

Did You Know?

Natural disasters such as earthquakes and tsunamis can cause much damage to harbors.



Dubrovnik, Croatia, has a good harbor on the Adriatic Sea, a branch of the Mediterranean Sea.

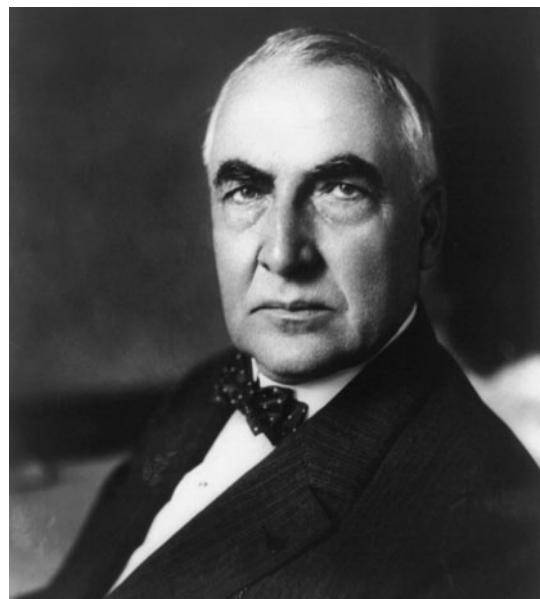
Harding, Warren G.

In 1920 Warren G. Harding easily won election as the 29th president of the United States. He was a popular leader, but he died before the end of his term. Soon after his death the public found out that politicians close to Harding had made illegal business deals. This changed many people's views about him.

Early Life

Warren Gamaliel Harding was born on November 2, 1865, on a farm near Corsica, Ohio. He was the eldest of George Tryon and Phoebe Dickerson Harding's eight children. His father was a farmer and a doctor.

Harding graduated from Ohio Central College in 1882. Two years later he bought a weekly newspaper in Marion, Ohio. In 1891 Harding married Flor-



Warren G. Harding was the 29th president of the United States.

ence Kling De Wolfe. The couple had no children.

Political Career

Harding became an Ohio state senator in 1898 and lieutenant governor in 1903. He ran for governor in 1910 but was defeated. In 1914, however, he was elected to the U.S. Senate.



TIMELINE

Harding is born near Corsica, Ohio.

November 2, 1865

Harding becomes lieutenant governor of Ohio.

1903

Harding is elected president.

1920

Harding's death makes Vice President Calvin Coolidge president.

August 2, 1923

Harding becomes an Ohio state senator.

Harding is elected to the U.S. Senate.

The United States and other countries agree to limit warships.

In 1920 Republicans chose Harding as their presidential candidate. Many voters were tired of President Woodrow Wilson and the Democrats' focus on international affairs. Harding promised to focus on the economy and other problems at home. He won the election easily.

Presidency

As president, Harding supported business and limited the number of immigrants allowed to enter the United States. During his term in office the United States also hosted an important international conference. Several countries agreed to reduce the number of warships that their navies would build. But Harding was not a strong leader. He appointed several dishonest men to government jobs. They took bribes, or illegal gifts, from companies and sold illegal liquor permits, among other things. Harding knew of some of those illegal activities but did not report them.

Death

By 1923 Congress was investigating the crimes of Harding's officials. Harding became ill, and on August 2 he died in San Francisco, California, from a heart attack or a stroke. Vice President Calvin Coolidge succeeded him as president.

► More to explore

Coolidge, Calvin • United States
• Wilson, Woodrow

Harpers Ferry

Harpers Ferry is a small town in the U.S. state of West Virginia. In 1859



An illustration shows U.S. Marines breaking into the arsenal at Harpers Ferry to capture John Brown.

Harpers Ferry was the site of a bloody raid in the movement to end slavery. The raid was one of the events that led to the American Civil War.

Harpers Ferry lies in the Blue Ridge Mountains where West Virginia, Virginia, and Maryland meet. At first the town was part of Virginia. It was named for Robert Harper. He settled there in 1734 and established a ferryboat service across the Potomac River. In the late 1700s the U.S. government set up an arsenal in Harpers Ferry. An arsenal is a place to make and store weapons.

On October 16, 1859, John Brown attacked the arsenal with a group of about 20 armed men. Brown wanted to end slavery. He believed that his raid would be the first battle in a slave rebellion. The raid was a failure. But it further divided the Northern and Southern states, which disagreed about slavery.

From 1861 to 1865 the North and the South fought each other in the Civil

War. The two sides fought many battles for control of Harpers Ferry. In 1863 the northwestern part of Virginia, including Harpers Ferry, became the new state of West Virginia. Today Harpers Ferry is part of Harpers Ferry National Historical Park.

► More to explore

American Civil War • Brown, John
• Slavery

Harrisburg



Population
(2000 census)
48,950; (2007
estimate)
47,196

Harrisburg is the capital of the U.S. state of Pennsylvania. The city lies on the Susquehanna River.

Many people in Harrisburg work for the government. The economy also depends on transportation and manufacturing.



The Harrisburg Symphony Orchestra plays for an audience on shore and in boats at a concert on the Susquehanna River.

Major highways and rail lines run through the city. Factories in Harrisburg produce steel, clothing, electronics, and machinery. The largest chocolate factory in the world is in nearby Hershey.

Harrisburg began as a trading post in about 1718. An Englishman named John Harris built the post to trade with the Susquehanna Indians. His son founded a town there in 1785. In 1812 Harrisburg became the capital of Pennsylvania. It soon developed into a transportation center. It became a stop on Pennsylvania's main railroad in 1847.

► More to explore

Pennsylvania

Harrison, Benjamin

Benjamin Harrison was the 23rd president of the United States. He won the 1888 election even though he got fewer votes than Grover Cleveland.

Early Life

Benjamin Harrison was born on August 20, 1833, in North Bend, Ohio. He was the son of John Scott Harrison, a farmer, and Elizabeth Irwin Harrison. His grandfather, William Henry Harrison, was the ninth U.S. president.

After graduating in 1852 from Miami University in Oxford, Ohio, Harrison studied in a law office in Cincinnati. In 1853 he married Caroline Lavinia Scott. The couple had two children.



Benjamin Harrison was the 23rd president of the United States.

Harrison moved to Indianapolis, Indiana, in 1854 to start his own law practice. He joined the new Republican Party and worked for the Indiana Supreme Court. During the American Civil War he fought for the Union.

Political Career

After the war Harrison returned to his law practice and his work at the Indiana

Supreme Court. In 1876 he ran unsuccessfully for governor of Indiana. Four years later he was elected to the U.S. Senate. He served there from 1881 to 1887.

In 1888 the Republican Party nominated Harrison for the presidency. His Democratic opponent was President Grover Cleveland. Harrison got about 100,000 fewer popular votes than Cleveland. However, Harrison won more votes in the electoral college, so he became president.

Presidency

As president, Harrison expanded the role and power of the United States. He made treaties with several countries. His secretary of state held the First International Conference of American States, a meeting of countries in the Western Hemisphere. Harrison also tried to make Hawaii a U.S. territory, but Congress refused.



TIMELINE

Harrison is born in North Bend, Ohio.

August 20, 1833

Harrison is elected president.

1888

Harrison is elected to the U.S. Senate.

1880

Harrison signs the Sherman Antitrust Act to promote free trade.

1890

First International Conference of American States is held in Washington.

1889-90

Harrison loses to Grover Cleveland in the presidential election.

1892

Harrison dies in Indianapolis, Indiana.

March 13, 1901

In addition, Harrison signed the Sherman Antitrust Act of 1890. This law encouraged free trade and outlawed monopolies, or industries controlled by one company.

Harrison ran for reelection in 1892, but he lost to former president Cleveland. During the campaign Harrison's wife died.

Retirement

In 1893 Harrison returned to Indianapolis and his law practice. In 1896 he married his wife's niece, Mary Lord Dimmick. They had one daughter. Harrison died on March 13, 1901.

► More to explore

Cleveland, Grover • Electoral College
• Harrison, William Henry • United States



William Henry Harrison was the ninth president of the United States.

At age 18 Harrison joined the U.S. Army. He fought against the Northwest Indian Confederation, a group of Native Americans fighting white settlement on their land. In 1795 Harrison married Anna Symmes. They had 10 children.

Political and Military Career

In 1798 President John Adams made Harrison secretary of the Northwest Territory, which became the states of Ohio, Illinois, Indiana, Michigan, and Wisconsin. After the Northwest Territory was divided, he governed the new Indiana Territory.

Between 1802 and 1809 Harrison made a number of treaties, or agreements, with Native Americans in the territory. The treaties gave millions of acres of land to the United States. Angered by the treaties, Tecumseh, a chief of the Shawnee, organized an uprising. In

Did You Know?

William Henry Harrison was the first president to die in office.

Harrison, William Henry

After an Army career, William Henry Harrison became the ninth president of the United States in 1841. Harrison died after only one month in office.

Early Life and Career

William Henry Harrison was born on February 9, 1773, at his family's plantation near Richmond, Virginia. He was the third son of Benjamin Harrison, a signer of the Declaration of Independence, and Elizabeth Bassett Harrison. Harrison attended Hampden-Sydney College from 1787 to 1790.



TIMELINE

Harrison is born near Richmond, Virginia.			Harrison wins the battle of the Thames during the War of 1812.		Harrison runs for president but loses the election.		Harrison dies after only one month as president.
February 9, 1773	1811	1813	1825–28	1836	1840	April 4, 1841	
	Harrison defeats the Shawnee at the battle of Tippecanoe.		Harrison serves in the U.S. Senate.		Harrison is elected president.		

1811 Harrison defeated Tecumseh at the battle of Tippecanoe. Harrison then became known as Old Tippecanoe.

During the War of 1812 with Great Britain, Harrison commanded U.S. forces in the Northwest. In 1813 his troops defeated the British and their Native American allies at the battle of the Thames in Ontario, Canada.

After the war Harrison served in the U.S. House of Representatives, the Ohio state senate, and the U.S. Senate. In 1836 the Whig political party nominated him for the presidency, but he lost the election to Martin Van Buren.

Presidency

In 1840 Harrison ran again for president. John Tyler was the vice presidential candidate. Their campaign slogan was “Tippecanoe and Tyler too.” Harrison won the election and took office on March 4, 1841. That day he

caught a cold that turned into pneumonia. Harrison died in the White House on April 4.

► More to explore

Shawnee • Tecumseh • Tyler, John
• United States • Van Buren, Martin
• War of 1812

Hartford



Population
(2000 census)
121,578;
(2007 estimate)
124,563

Hartford is the capital of the U.S. state of Connecticut. The city has a port on the Connecticut River.

Hartford is a center of business and industry. It is sometimes called the Insurance City. That is because many



The state Capitol is a government building in Hartford, Connecticut. It has a dome that is covered in gold.

large insurance companies are based there. Banks, hospitals, and government offices also provide many jobs. Factories in the city make aircraft parts, guns, and tools.

English settlers founded Hartford in 1635. It became one of the two capitals of Connecticut in 1701. (New Haven was the other capital.)

A newspaper called the *Hartford Courant* was started in 1764. Today it is the oldest U.S. newspaper that is still in business. The city's insurance industry started in 1794.

In 1875 Hartford became the only capital of Connecticut. In the late 1800s the city was home to two famous writers—Harriet Beecher Stowe and Mark Twain. Today people can visit the writers' homes, which have been preserved as museums.

► More to explore

Connecticut • Stowe, Harriet Beecher
• Twain, Mark

Hatshepsut

Hatshepsut was one of only a few women to rule ancient Egypt. Some 3,500 years ago she achieved rare power as a queen.

Hatshepsut's parents were King Thutmose I and Queen Ahmose. Hatshepsut married her half brother Thutmose II. This was a common practice in her day. Her father died in about 1482 BC. Hatshepsut and her husband then came to power. In 1479 BC her husband died. Thutmose III, her stepson, then became king. But he was too young to rule. So Hatshepsut governed for him.

Hatshepsut steadily gained in influence. She soon had herself crowned as pharaoh (the supreme ruler). To strengthen



A statue of Hatshepsut was carved nearly 3,500 years ago.

her image as ruler, she wore the traditional clothing of a pharaoh. She even wore the usual false beard.

The queen had a temple built in her honor near the city of Thebes. Paintings on the temple walls record major events of her reign. She also made an effort to expand Egypt's trading. She sent ships to the southern coast of the Red Sea. The ships returned with valuable goods including gold, ebony, animal skins, and spices.

As the queen and her supporters grew older and weaker, Thutmose III and his followers grew stronger. Hatshepsut died in about 1458 BC. Thutmose III then took power.

► More to explore

Egypt, Ancient • Pharaoh

Havana



Population
(2006 estimate)
2,174,790

Havana is the capital of Cuba, an island country in the Caribbean Sea. It is the largest city in the Caribbean region. Havana is known for its many buildings from the time Cuba was a Spanish colony. The city lies on a bay with a protected harbor.

Havana is the island's main port. It is also Cuba's center of business and industry. Factories in the city build ships and make processed foods, cloth, and chemicals. Havana cigars are world famous. Tourism also brings money to the city.

Spanish conquerors took over Cuba in the early 1500s. They founded Havana in 1519. The city later became the center of Spanish government in Cuba. It was also the main base for Spain's navy in the Americas. In the 1700s and 1800s Havana grew into a major port for trade.

In 1898 Cuba became an independent country with Havana as its capital. The city was famous for its lively nightclubs and places to gamble. Until 1959 Havana was a popular vacation spot for wealthy people from Cuba and the United States.

In 1959 Fidel Castro took power in Cuba. The United States disapproved of Castro and the government that he established. People from the United States stopped traveling to Havana. Castro also focused on improving conditions in the countryside, instead of in Havana. The city began to decline.

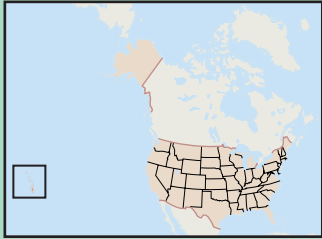
In 1982 the United Nations named Old Havana, the most historic part of the city, a World Heritage site. Then the government began to restore Havana's historic buildings.

► More to explore

Cuba

Did You Know?

Havana has several forts called castles. The oldest was built in the 1500s.



Hawaii

Hawaii is the only U.S. state that is made up entirely of islands.

Some of the area's first settlers came from a place called Hawaiki. It is believed that the state's name was formed from this word. According to legend, a man named Hawaii Loa discovered the islands. Hawaii is nicknamed the Aloha State. Aloha is a Hawaiian word with several meanings. It is often used to mean "welcome," "hello," or "good-bye." The capital of Hawaii is Honolulu.

Geography

Hawaii is made up of about 132 islands and islets. The island chain is located in the Pacific Ocean about 2,400 miles (3,860 kilometers) from the western coast of the U.S. mainland. The Hawaiian Islands were formed by volcanoes and were built up over millions of years. The eight main islands in the chain are Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, Niihau, and Kahoolawe.



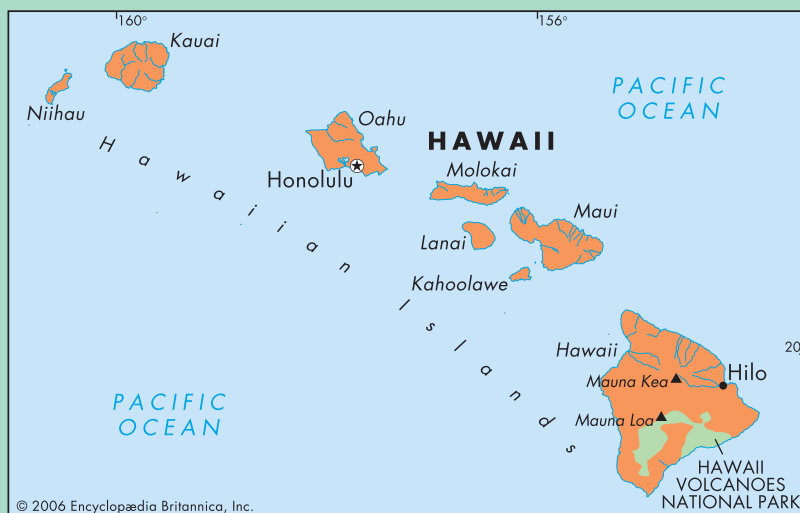
Steep cliffs in the U.S. state of Hawaii meet the deep blue waters of the Pacific Ocean. Tourists from all over the world visit Hawaii to see its great natural beauty.

The island of Hawaii is often called the Big Island. That is partly because it is the largest of the islands. The nickname also helps distinguish it from the state as a whole. Hawaii is the youngest of the islands. It includes Mauna Loa, the world's largest volcano, and Kilauea, one of the world's most active volcanoes. The island is still growing. As the lava from Kilauea cools, it hardens and adds to the land.

The entire state is known for its pleasant weather. Despite the state's tropical location, cooling ocean currents keep the climate mild.

People

Hawaii is the only state in which the majority of the population does not trace its heritage back to Europe. The first people to live in Hawaii were probably people who sailed from the Mar-



quesas Islands. The Marquesas are part of a region called Polynesia. The Polynesians arrived in Hawaii perhaps as early as AD 400. The current population includes whites, Japanese, Hawaiians, Filipinos, and Chinese. Many people are of mixed ancestry. Oahu has the largest population of all the islands. The city of Honolulu is on Oahu.

Economy

Tourism is the basis of Hawaii's economy. Almost 7 million tourists visit each year to enjoy the island scenery, mild weather, and beautiful beaches. Hawaii also has several military bases. Military spending plays an important role in the state's economy. Agriculture is another source of state income. Pineapples, sugarcane (for sugar), and macadamia nuts are major crops.

History

Hawaii was settled more than 1,500 years ago by people from Polynesia. The

first European to reach the islands was British explorer James Cook, who arrived at Kauai Island in 1778. At that time each island was ruled by its own individual chief. By 1810, however, King Kamehameha I had united all of the islands under his rule. Missionaries, traders, planters, explorers, and adventurers began arriving on the islands in the 1820s.

In 1858 the Kingdom of Hawaii asked to become part of the United States but was refused. In 1893 a revolution led to the end of the monarchy. The last queen was Queen Liliuokalani. The new government again tried to join the United States but was also turned down. Instead, the leaders of the government established a republic with a president in 1894. In 1898 Hawaii finally was accepted by the United States. It became the Territory of Hawaii in 1900.

On December 7, 1941, the Japanese airplanes attacked U.S. warships that were stationed at Pearl Harbor, near Honolulu. This action caused the United States to enter World War II.

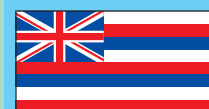
In 1959 Hawaii became the 50th state in the Union. Led by a rush in tourism, the state made major economic gains after it attained statehood. Many tourists visit the wreck of the *Arizona*, a large ship that was sunk in the attack on Pearl Harbor. The ship was left in place to honor the people who died in the attack.

► More to explore

Cook, James • Honolulu • World War II

Facts About HAWAII

Flag



Population

(2000 census)
1,211,537—
rank, 42nd state;
(2008 estimate)
1,288,198—
rank, 42nd state

Capital

Honolulu

Area

10,931 sq mi
(28,311 sq km)—
rank, 43rd state

Statehood

August 21, 1959

Motto

*Ua Mau ke Ea o
ka Aina i ka Pono*
(The Life of the
Land Is
Perpetuated in
Righteousness)

State bird

Nene (Hawaiian
goose)



State flower

Yellow hibiscus



Hawaii's Kilauea is an active volcano.

Hawk

Hawks are birds of prey, meaning that they hunt and kill animals for food. Hawks are closely related to eagles, kites, harriers, buzzards, and some vultures. Those birds are sometimes also called hawks because they are in the hawk family. There are about 50 kinds of “true” hawks. These include the sparrowhawks and the goshawks.

Two typical hawks are the sharp-shinned hawk and Cooper’s hawk. These hawks have a gray back and a rusty brown underside. The sharp-shinned hawk is about 12 inches (30 centimeters) long. The Cooper’s hawk is larger, with a length of about 14 to 20 inches (36 to 51 centimeters).

Hawks live in forests in most parts of the world. They usually have a long tail and short, rounded wings. These features allow them to fly fast and low in areas with bushes and trees. A hawk



The Eurasian sparrowhawk lives in forests in Europe and Asia. It also can be found in northwestern Africa.

often catches its prey by swiftly following the animal as it tries to escape. It uses its sharp claws and beak to catch and kill the animal.

Many people think hawks are harmful because some kinds eat songbirds and poultry. But most hawks are actually more useful to humans overall. They eat rodents, insects, and other pests. Hawks also eat other small animals such as squirrels and lizards.

► More to explore

Bird • Bird of Prey • Eagle • Vulture

Hawthorn

Hawthorns are trees and shrubs that are beautiful to look at but painful to touch. Like rose bushes, hawthorns have long, sharp thorns covering their branches. The thorns protect the plant from damage by animals. Hawthorns grow in cool-climate areas of Europe, Asia, and North America.

Hawthorns are usually small trees or large shrubs. Some hawthorns can grow to about 30 feet (9 meters) tall. They have scaly, gray bark. Their oval leaves have teeth or rounded sections along the edges. Hawthorns shed their leaves in the autumn. In late spring and early summer white or pink flowers bloom. When the flowers die, small red fruits appear.

A row of hawthorns planted together makes a good hedge. The sharp thorns prevent animals or intruders from passing through. Songbirds and small ani-



Hawthorn trees produce white or pink flowers once a year.

mals may also hide from predators among the sharp thorns. The fruit from hawthorns can be eaten fresh or made into jelly. Birds also eat the fruit. Hummingbirds and insects drink a sweet liquid called nectar from the flowers.

► More to explore

Plant • Tree

Hayes, Rutherford B.

Rutherford B. Hayes was the 19th president of the United States. He was elected in 1876. Many people argued about whether the election was fair.

Early Life and Career

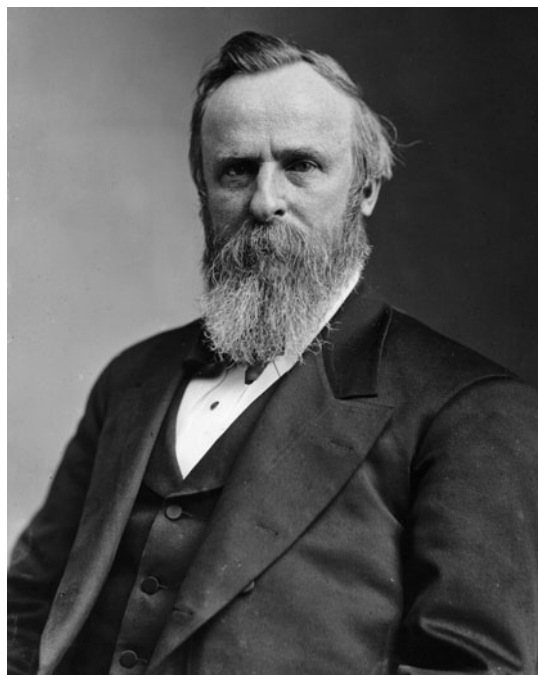
Rutherford Birchard Hayes was born on October 4, 1822, in Delaware, Ohio. His father, farmer Rutherford Hayes, died before Rutherford was born. His mother, Sophia Birchard, educated him at home.

Hayes graduated from Kenyon College in 1842. After studying law at Harvard University, he started a law practice in Cincinnati. He also joined the new Republican Party. In 1852 Hayes married Lucy Ware Webb. They had eight children.

After fighting in the American Civil War, Hayes entered the U.S. House of Representatives in 1865. He was reelected to the House in 1866. Hayes then served three terms as governor of Ohio.

Election of 1876

In 1876 the Republicans chose Hayes as their candidate for president. His Democratic opponent was Samuel J. Tilden, governor of New York. Tilden won the popular vote, but the results in the electoral college were uncertain. The Republicans said the voting results from three Southern states were wrong. In



Rutherford B. Hayes



TIMELINE

Hayes is born in Delaware, Ohio.

October 4, 1822

Hayes is elected president.

1877

Hayes signs a law to allow women lawyers to practice before the Supreme Court.

1879

Hayes dies in Fremont, Ohio.

January 17, 1893

Hayes becomes governor of Ohio.

1868

Hayes ends Reconstruction in the South.

1877

Hayes retires from the presidency.

1881

January 1877 Congress set up a commission to decide the election. On March 2 the commission, made up of eight Republicans and seven Democrats, decided in favor of Hayes. The decision angered many Democrats.

Presidency

As president, Hayes ended the period known as Reconstruction. This was the period following the Civil War when the country worked to bring the Southern states back into the Union. He took U.S. troops out of the South. He gave Southern states control of their elections. He also appointed Southerners to government offices. Hayes's policies toward the South angered conservative Republicans known as the Stalwarts.

The Stalwarts also disagreed with Hayes's efforts to end the "spoils system." In that system the government gave out jobs as political rewards. Hayes wanted to give the jobs to people who

passed a test. Congress refused to change the system, but people became more aware of its problems.

Retirement

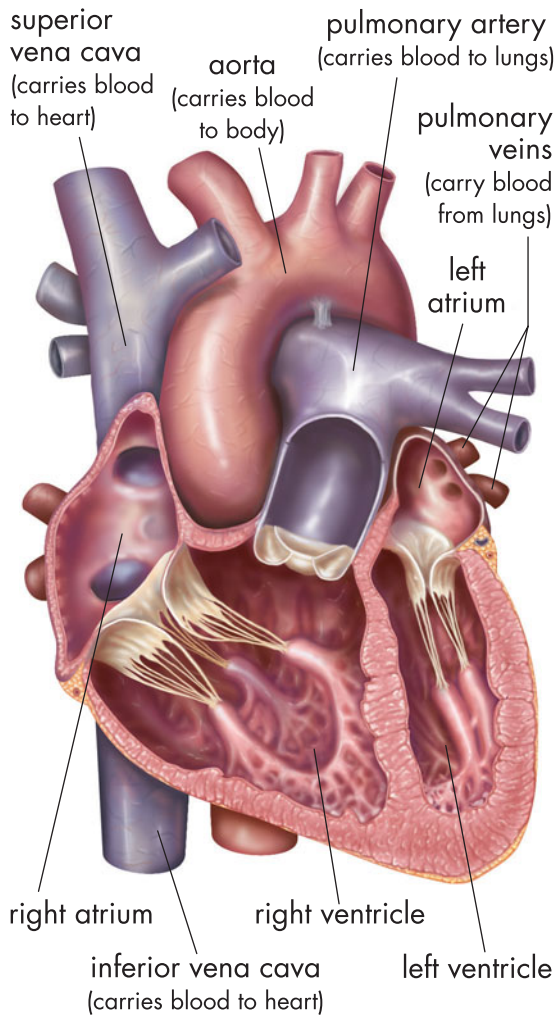
Hayes did not run for reelection in 1880. In retirement he was involved in several causes. Most notably he worked to improve prisons and to provide better education for African Americans in the South. He died in Fremont, Ohio, on January 17, 1893.

► More to explore

Electoral College • Reconstruction
• United States

Heart

The heart is the organ, or body part, that pumps blood through the body. It is the main organ of the cardiovascular system. The cardiovascular system carries substances to and from all parts of the body in the blood.



Blood enters the right atrium of the heart. It flows into the right ventricle, through the lungs, and into the left atrium. Finally, it passes into the left ventricle and then leaves the heart.

The Human Heart

The human heart is pear-shaped and slightly larger than a fist. It is located high in the chest, slightly to the left. The heart of a grown-up person weighs about 8 to 12 ounces (230 to 340 grams).

The heart is made of very strong muscle. This muscle pumps blood by squeezing and relaxing in a regular rhythm. This rhythm is called the heartbeat. The heart

muscle beats an average of 70 times per minute. More than 4 quarts (3.8 liters) of blood pass through the heart every minute.

The human heart is divided into right and left halves. Each half is divided into two hollow sections called chambers. The upper chambers are called atria. (Each of these chambers is called an atrium.) The lower chambers are called ventricles.

Blood from the body flows into the right atrium. This blood carries a waste product called carbon dioxide. The blood then passes into the right ventricle. The right ventricle pumps the blood to the lungs. In the lungs, blood picks up oxygen and releases carbon dioxide. The oxygen-rich blood enters the heart's left atrium. The blood then passes into the left ventricle. The left ventricle pumps the blood throughout the body.

Problems with the heart include irregular heartbeat and heart disease. Irregular heartbeat is a heartbeat that is too slow,



A patient runs while a machine records his heartbeats. The machine tells doctors whether the patient's heart is healthy.

too fast, or unsteady. Heart disease happens when fatty substances build up inside blood vessels. The fatty deposits block blood from getting to the heart. Heart disease can lead to a heart attack. A heart attack happens when part of the heart muscle dies. Exercise and eating a healthy diet can help to keep the heart healthy.

The Hearts of Other Animals

Like the human heart, the hearts of mammals and birds have four chambers. The hearts of other animals are different. Amphibians and lizards have hearts with three chambers. Fishes' hearts are folded tubes, with three or four sections that are like chambers. Spiders and some worms have hearts that are straight tubes.

► More to explore

Blood • Lung • Muscle

Heat

Heat is a form of energy. Heat flows from hot objects to cool objects. It flows from one object to another because of



The heat of a fire cooks peppers on a grill.

their difference in temperature. The cool object absorbs the energy and becomes warmer.

Objects are made of particles, or bits, called molecules. Molecules are always in motion. As an object is heated, the molecules in the object move faster. When this happens, the temperature of the object rises.

Heat travels in three ways: by conduction, by convection, and by radiation. Conduction is the flow of heat inside an object. It is also the flow of heat between objects in contact with each other. An example is the flow of heat from a hot frying pan to food placed on the pan to cook.

Convection is the flow of heat caused by the motion of a liquid or a gas. An example is the heating of water in a teakettle. As water is heated, the molecules that make up the water rise and the heat spreads.

Heat radiation is the flow of heat between objects that are not in contact with each other. An example is the heat felt by someone standing a distance away from a hot stove.

Radiation from the sun gives Earth most of its heat. Energy from the sun's radiation is stored in such fuels as coal, oil, gas, and wood. These fuels can be burned to provide more heat.

► More to explore

Energy • Molecule • Sun

Heather



Heather plants grow on a hill in Yorkshire, England.

Scotland is famous for its rolling hills covered with the beautiful purple flowers of the plant called heather. Scotland is not the only place that heather grows, however. Heather grows throughout Great Britain, northwestern Europe, northern Asia, and North America. Heather grows well in poor soil. It needs lots of sunlight to grow.

Heather is an evergreen plant. This means that it does not lose its leaves in autumn. Heather usually does not grow taller than 3 feet (0.9 meter). Its leaves are most often green. But they also may be gray, yellow, gold, orange, or red. Heather has tiny, bell-shaped flowers that are pink, rose, purple, red, or white.

Heather is a useful plant. It can be made into brooms and baskets. Long ago, the people of Scotland made houses of heather mixed with mud and straw. Heather also attracts bees and butterflies.

The scientific name of heather is *Calluna vulgaris*. Heather belongs to a family, or group, of plants called heaths. Other plants in the heath family include the blueberry plant.

► More to explore

Plant • Scotland

Hedgehog

Hedgehogs are small mammals that live in the wild in Europe, Africa, and Asia. They are also kept as pets in some parts of the world. People sometimes call porcupines hedgehogs, but hedgehogs and porcupines are different animals.

Hedgehogs are found in deserts, forests, grasslands, marshes, and gardens. They spend the day sleeping under leaves or in holes. They come out at night to eat insects, slugs, spiders, small reptiles, and fallen fruit.

The hedgehogs called spiny hedgehogs have thousands of sharp spines on their bodies. Spines cover everything except



There are 15 species, or types, of hedgehog. The European hedgehog is sometimes kept as a pet.

the underside, legs, face, and ears. The spines are cream colored with bands of brown and black. When threatened, spiny hedgehogs curl into a ball so that only their spines are showing. The spines keep most animals from harming the hedgehog.

Some spiny hedgehogs hibernate in the winter. Hibernation allows an animal to use less energy when food is hard to find. While hibernating, hedgehogs use the fat built up in their bodies to survive.

Hairy hedgehogs have hair instead of spines. They also have well-developed tails. They look like rats. Their hair color ranges from white to brownish red to black. The hair may be soft or very rough. Hairy hedgehogs can be the size of a mouse, or they can be as long as 18 inches (46 centimeters).

► More to explore

Hibernation • Mammal • Pet
• Porcupine

Helena



Population
(2007 estimate)
28,726

Helena is the capital of the U.S. state of Montana. The city is located near the Missouri River and the Rocky Mountains.



The Montana state Capitol, in Helena, was opened for use on July 4, 1902.

Helena is a center for the trade of crops and livestock. Many people there work for the state government. Manufacturing industries and tourism also bring money to the city. The Montana Historical Society is located in Helena. It has a museum, a library, and an art gallery.

The explorers Meriwether Lewis and William Clark passed through the Helena area in 1805. The town was founded after gold was discovered there in 1864. The miners had almost given up their search for gold. Finally they struck gold in a place they called Last Chance Gulch. The town was named for Helena, Minnesota.

Helena became the capital of the Montana Territory in 1875. Montana became a U.S. state in 1889. Helena remained the capital. Earthquakes damaged the city in the 1930s, but the damage was quickly repaired.

► More to explore

Lewis and Clark Expedition • Montana

Helicopter

A helicopter is a kind of aircraft. Unlike an airplane, a helicopter can fly straight up and down, sideways, or backward. It can also spin around or hover motionless in the air. Helicopters can fly lower than airplanes can, too.

How a Helicopter Flies

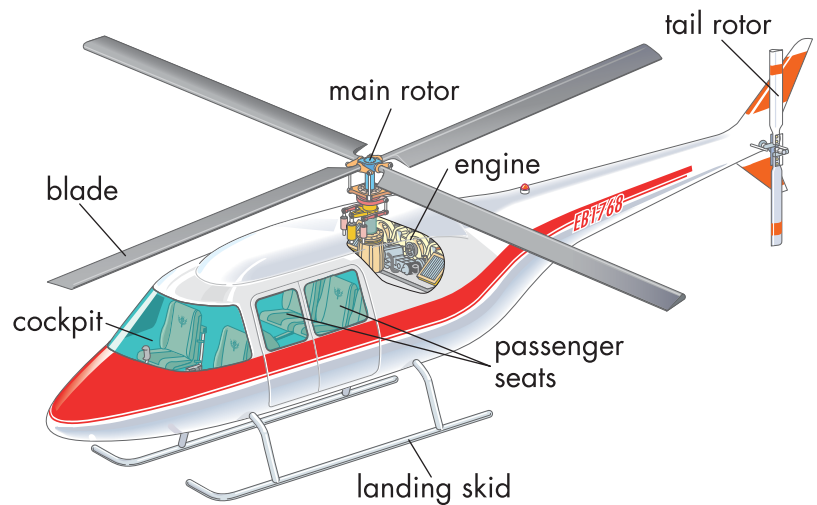
Like an airplane, a helicopter flies using wings. A helicopter's wings are thin, narrow blades that rotate, or spin around. The blades on top of a helicopter, along with the parts that connect them, are called the main rotor. The main rotor is connected to an engine. The engine sends power to the main rotor to spin the blades. Most helicopters have just one main rotor, but some have two or more.

As the blades spin, air pushes against them. A helicopter pilot has controls that change the position of the blades. This affects how the air hits them. The pilot also controls how much power the engine sends to the rotor. Using these controls together, the pilot can move the helicopter up, down, forward, backward, or sideways.

A helicopter also has a small set of blades in the back. This is called the tail rotor. To turn the helicopter, the pilot pushes pedals that move the tail rotor. The tail rotor also keeps the helicopter from spinning around.

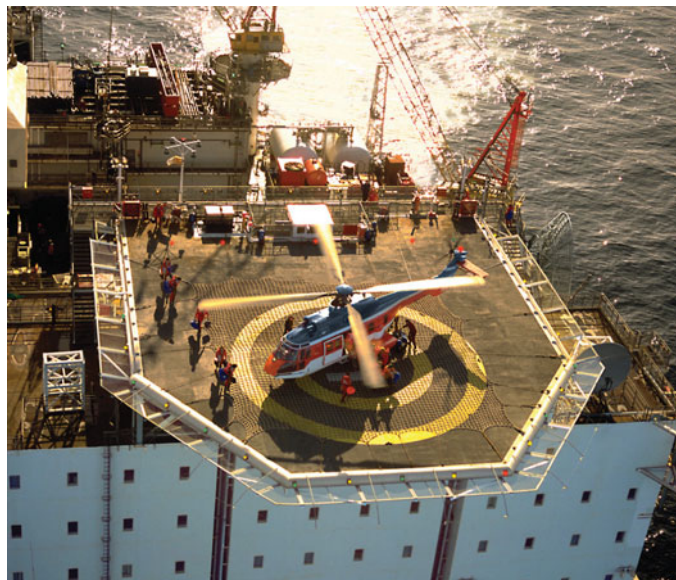
Uses

Helicopters are useful because they can fly almost anywhere. They are used to



The diagram shows the different parts of a helicopter.

rescue people from disasters such as fires, floods, and earthquakes. Helicopters can quickly carry injured people to a hospital. They can even land on the roofs of some hospitals and other buildings. Armies use helicopters to attack the enemy and to carry soldiers and equipment. Police use helicopters to look for criminals. Farmers use them to spread seeds and fertilizers on their fields.



A helicopter picks up workers from an oil platform in the North Sea.

History

People in China and Europe made toys that worked like helicopters many hundreds of years ago. In the 1400s the Italian artist and engineer Leonardo da Vinci drew an aircraft much like today's helicopters. It was never built. In 1843 the English inventor Sir George Cayley built a helicopter powered by a steam engine. It could barely get off the ground.

By the 1900s more powerful engines were available. Engineers used these engines to improve the helicopter. They also made improvements that helped keep helicopters stable in the air. The first successful helicopters were built in Germany in the 1930s. After that, engineers designed new types of helicopters that were used for all kinds of different purposes.

► More to explore

Airplane • Leonardo da Vinci

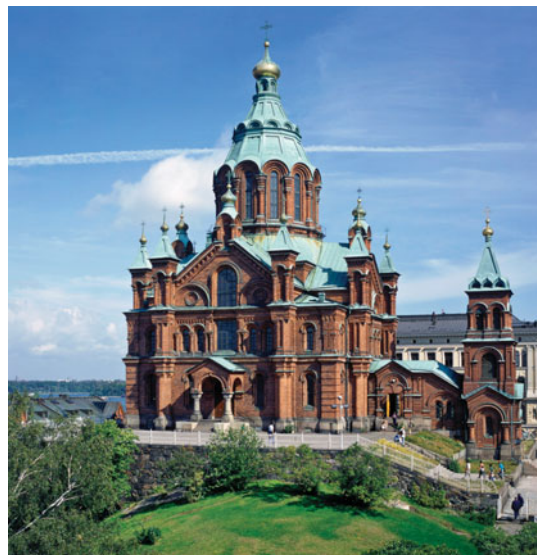
Helsinki



Population

(2008 estimate), city, 568,531;
(2003 estimate), urban area, 1,075,000

Helsinki is the capital of Finland, a country in northern Europe. It is Finland's largest city. Helsinki is located on land that sticks out into a gulf of the



The Uspenski Cathedral is located in Helsinki. It is the largest Orthodox church in western Europe. It was built in the 1860s, when Russia ruled Finland.

Baltic Sea. The city is surrounded by good natural harbors.

Helsinki is Finland's leading port and center of industry. The city's main industries include shipbuilding and printing. Factories in the city make electronics, clothing, and metal products. Most people in Helsinki work in industries that provide services. Businesses related to computers, telephones, and other kinds of technology are important to the city's economy.

The king of Sweden founded Helsinki in 1550. Finland was part of Sweden for hundreds of years.

In the early 1700s Helsinki suffered from disease, fire, and attacks by Russian forces. Russia invaded the city again in 1808. Helsinki was burned to the ground. Soon all of Finland became part of Russia.

The Russian ruler moved the capital of Finland to Helsinki in 1812. Helsinki grew rapidly as the new capital. The city center was completely rebuilt.

In 1917 Finland declared its independence from Russia. A brief but bloody war followed in Helsinki. Conditions soon became more stable. Helsinki developed into an important center of trade, industry, and culture.

► More to explore

Finland

Hemisphere

A hemisphere is half of a sphere, or ball. People use the word to describe one half of Earth. Geographers, or people who study Earth, have divided the planet into two sets of two hemispheres. These are the Northern and Southern hemispheres and the Eastern and Western hemispheres.

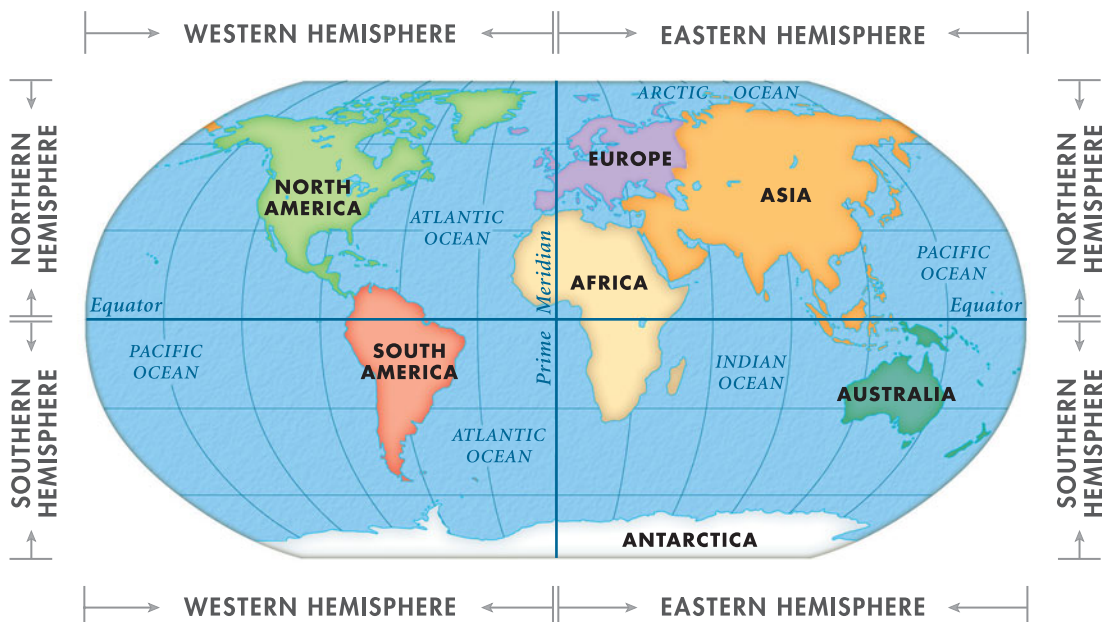
Northern and Southern Hemispheres

An imaginary line called the equator divides the Northern and Southern hemispheres. The equator is also called 0° latitude. It runs east and west around Earth's middle. Places north of the equator are part of the Northern Hemisphere. Places south of the equator are in the Southern Hemisphere.

The Northern Hemisphere includes North America, Central America, Europe, and mainland Asia. About half of Africa and a small part of South America are also in the Northern Hemisphere. The rest of Africa, most of South America, and all of Australia and Antarctica lie in the Southern Hemisphere.

Eastern and Western Hemispheres

Another imaginary line separates Earth into Eastern and Western hemispheres. On one side of Earth, this line is called



Did You Know?

Seawater covers about 80 percent of the Southern Hemisphere. It covers about 60 percent of the Northern Hemisphere.

0° longitude, or the prime meridian. It runs from the North Pole to the South Pole through western Europe, western Africa, and the Atlantic Ocean. On the other side of Earth, the line is called 180° longitude. It runs from the North Pole to the South Pole through the Pacific Ocean.

The Western Hemisphere lies west of 0° longitude and east of 180° longitude. It includes North America and South America. The Eastern Hemisphere lies east of 0° longitude and west of 180° longitude. It includes almost all of Europe and Africa and all of Asia and Australia. About half of Antarctica lies in the Eastern Hemisphere, and about half lies in the Western Hemisphere.

► More to explore

Equator • Latitude and Longitude

Hemlock

Hemlocks are tall evergreen trees in the pine family. There are about 10 species, or types, of hemlock found in North America and eastern Asia. Hemlocks grow slowly and can live for 800 years or more.

Hemlocks grow best in cool, shaded areas. They grow to an average height of 60 to 70 feet (18 to 21 meters) but can be much taller. They have drooping branches that form the shape of a pyramid. Small cones hang from the branch tips. The cones hold the tree's seeds. The leaves, called needles, are short and flat. Insects eat the needles and can destroy whole forests of hemlocks.



Many hemlock trees grow in cold places. Sometimes frost covers their needles.

The bark of hemlock trees provides tannin. Tannin is used to preserve and dye leather. People also make paper out of hemlock wood.

Some poisonous plants also are called hemlock, but they are not related to hemlock trees. They include poison hemlock and water hemlock. These plants are poisonous herbs of the parsley family. They grow in North America and Europe. Animals and people can die from eating these plants.

► More to explore

Herb • Pine • Tree

Henry VIII

England had eight kings named Henry. The last of them, Henry VIII, is remembered for his six wives and his quarrel with the Roman Catholic church.



A painting from the 1500s shows King Henry VIII of England. A famous artist named Hans Holbein the Younger made the painting.

Henry VIII was born in England on June 28, 1491. He was not yet 18 when he became king in 1509. Later that year he married Catherine of Aragon. Catherine had six children, but only one, named Mary, survived to adulthood.

Henry wanted a boy to inherit the throne. He believed that he needed a new wife to have his son. At the time, Henry and most English people belonged to the Roman Catholic church. However, in 1527 the pope (the leader of the Roman Catholic church) refused to allow Henry to end his marriage to Catherine. Henry therefore cut all ties to the church and placed himself in charge of the new Church of England, or Anglican church. Henry severely punished those who continued to practice the Catholic faith.

The king soon married Anne Boleyn. Her only child was a daughter, Elizabeth. In 1536 he had Anne Boleyn put to death. A few days later he married Jane Seymour. She gave birth to Edward, the son Henry wanted. Then she died.

Henry then married a German princess, Anne of Cleves. He soon divorced her. In 1540 he married Catherine Howard. Henry had her, like Anne Boleyn, put to death. In 1543 Henry took his sixth wife, Catherine Parr, who outlived him.

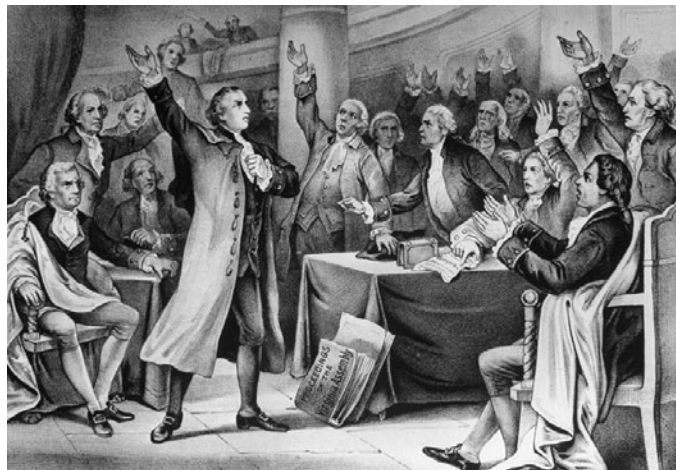
Henry died on January 28, 1547. During his reign he had united England and Wales. He had also taken control of Ireland. Three of his children—Edward, Mary, and Elizabeth—later became rulers of England.

► More to explore

Elizabeth I • England

Henry, Patrick

Patrick Henry was an early American patriot who helped shape the first gov-



Patrick Henry delivers his "give me liberty or give me death" speech in 1775.

ernment of the United States. His powerful speeches about liberty and self-government still inspire people today.

Early Life

Patrick Henry was born in Studley, Virginia, on May 29, 1736. He received very little schooling as he was growing up. Later he studied law. He became a lawyer in 1760.

Career

Henry soon became very successful as a lawyer. He also began speaking out against the British government. He strongly believed that the American colonies should be free of British rule. In a speech in 1775 Henry spoke his most famous words: “give me liberty or give me death.”

Throughout his life Henry had several jobs in government. He began in 1774 as a member of the Continental Congress. The congress was in charge of governing the 13 colonies. He also served several terms as governor of Virginia. He came out of retirement in 1780 to serve in Virginia’s legislature.

After the American Revolution Henry protested against the new U.S. Constitution. He believed that the Constitution did not give enough rights to the states or to individual citizens. Many people agreed with him. Henry’s beliefs helped get 10 amendments, or changes, added to the Constitution in 1791. These amendments are known as the Bill of Rights. The Bill of Rights gives many important freedoms to U.S. citizens.

Henry was elected to the Virginia legislature again in 1799. However, he never started his term. He died of cancer at his home near Brookneal, Virginia, on June 6, 1799.

► More to explore

American Revolution • Bill of Rights
• Continental Congress

Henson, Jim



Jim Henson poses with the Muppets.

Kermit the Frog, Cookie Monster, and Oscar the Grouch are a few of the characters known as Muppets. Their creator was Jim Henson. He made up the word Muppets as a blend of “marionette” (a type of puppet controlled by strings) and “puppet.”

James Maury Henson was born on September 24, 1936, in Greenville, Mississippi. He created the Muppets while attending college. Most puppets of the

Did You Know?

Patrick Henry helped to write the first constitution of the state of Virginia.

time were made of wood. But Henson searched for material that would be easier to move and could let characters show more personality. He chose foam rubber and plastic covered with fabric.

The Muppets began appearing in brief segments on television programs in the late 1950s and 1960s. They became very popular in 1969 when they became part of the television show *Sesame Street*. They were featured in their own television program, *The Muppet Show*, from 1976 to 1981. They later appeared in *The Muppet Movie* (1979) and other motion pictures. Henson also worked on films that had puppets other than the Muppets. He died in New York City on May 16, 1990.

Henson, Matthew

Matthew Henson may have been the first person to stand at the North Pole. He reached the Pole as a member of an expedition to the Arctic led by the explorer Robert E. Peary in 1909.

Matthew Alexander Henson was born in Maryland on August 8, 1866. When Henson was only about 13 he went to work on a sailing ship. His ship visited ports across the world. In 1887 Henson became an assistant to Peary. Peary was a young naval officer who had already made one trip to the Arctic.

Peary and Henson made seven expeditions to the Arctic. They hoped



When he explored the Arctic, Matthew Henson had to dress warmly.

to be the first people to reach the North Pole. In 1908 they set out on one of their expeditions, though they did not always stay together. On April 6, 1909, Henson arrived alone at what he believed to be the North Pole. When Peary joined him an hour later, he refused to accept Henson's calculation. Peary chose a different spot and declared it the North Pole.

When they returned home Peary received most of the credit for the discovery. This was partly because he was the leader of the expedition. But it was also because Henson was an African American. Racial prejudice at the time kept him from receiving credit for his accomplishments.

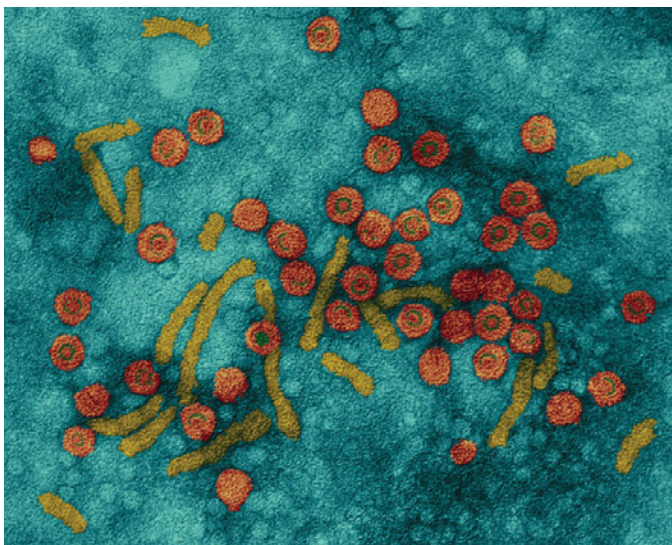
Later in Henson's life he gained some recognition for his achievements. Henson died in New York City on March 9,

1955. In 1988 he was reburied in a military ceremony at Arlington National Cemetery. He lies there next to Admiral Robert Peary.

Hepatitis

Hepatitis is a disease that damages the liver. The liver is an organ, or body part, that removes wastes from the blood. Most cases of hepatitis are caused by a particle called a virus. There are seven different hepatitis viruses. To tell them apart, the viruses are labeled with the letters A through G.

The hepatitis A virus causes the most common form of the disease. It is a mild, short-term illness. The hepatitis B, C, and D viruses can cause long-term liver problems. The hepatitis E virus usually causes a serious illness, and it can lead to death.



A photograph shows a magnified image of the hepatitis B virus. Color has been added to the photograph to make the virus easier to see.

Hepatitis A, E, and F are spread through contact with infected food or water. Hepatitis B, C, D, and G are spread through infected blood and other bodily fluids. People who take certain medicines or drink too much alcohol can also get hepatitis.

The symptoms, or signs, of hepatitis include fever, tiredness, loss of appetite, vomiting, and muscle aches. In severe cases the liver damage can lead to a condition called jaundice. Jaundice causes a person's eyes and skin to turn yellow.

A person with a serious case of hepatitis may need to stay in a hospital. If the liver fails, the person may need a liver transplant. In this type of surgery a doctor replaces the damaged liver with a healthy one.

► More to explore

Disease, Human • Liver • Virus

Hephaestus

In ancient Greek mythology Hephaestus was the god of fire. He was one of the 12 gods believed to live on Mount Olympus. Hephaestus was also the blacksmith and craftsman of the gods. Volcanoes and fires were considered his workshops. His symbols were the ax, hammer, and tongs—tools he used in his trade. Hephaestus was associated with the Roman god Vulcan because they shared many of the same characteristics.

Hephaestus was the son of Zeus, the chief god, and Hera. According to one



Hephaestus was the god of fire.

legend Hephaestus was born disabled, and his mother threw him into the sea because of that. He was rescued by two goddesses. They cared for Hephaestus and taught him to craft jewelry out of

seashells and coral. Because of his skill, Zeus allowed him to return to Mount Olympus. Hephaestus made weapons, armor, and jewelry using fire and metals. He even made lightning for his father.

People in ancient Rome celebrated a festival of Hephaestus called Vulcanalia every August. It was celebrated to protect people from destructive fires. During a ceremony, Roman families threw small fish into the fire.

► More to explore

Mythology

Hera

In ancient Greek mythology Hera was the wife of Zeus, the king of the gods. Because of this marriage, she was queen of the gods. Hera was also the goddess of marriage and women's lives. For instance, she was thought to protect women during childbirth. Hera was one of the 12 chief gods believed to live on Mount Olympus. She is associated with the Roman goddess Juno because the two shared many traits. The cow and peacock were sacred to Hera.

Hera was the daughter of Cronus and Rhea, who were Titans. The Titans were giants who once ruled the world. Hera's children with Zeus included Ares and Hephaestus. Ares was the god of war and Hephaestus was the god of fire.

Although the Greeks honored Hera, most stories portray her as jealous and

Did You Know?

In some stories Hephaestus was the husband of Aphrodite.



Hera was the queen of the gods of ancient Greece.

violent. Zeus loved many other women. Hera was always angry about her husband's affairs. She punished the women whom Zeus liked whether they were interested in him or not. She also punished the children Zeus had with other

women. For example, she tried to harm the Greek hero Heracles.

► More to explore

Ares • Greece, Ancient • Mythology
• Zeus

Heracles

In ancient Greek mythology Heracles was a hero with amazing strength and courage. The ancient Romans called him Hercules.

According to legend, Heracles' father was Zeus, the chief god. His mother was Alcmene. Zeus's wife was Hera. She was jealous of all the women that Zeus loved, including Alcmene. Because of this, Hera hated Heracles.

Hera caused Heracles to become insane for a couple of minutes. During his madness Heracles killed his wife and children. As soon as the madness passed, he was horrified and overcome with grief. He consulted a priestess who was thought to speak for the gods. He asked her how he could make up for his awful deed. She told Heracles to visit King Eurystheus and do whatever he asked. Heracles followed the advice. But the king assigned Heracles 12 tasks that seemed impossible to accomplish.

Heracles was ordered to kill or capture several dangerous monsters. These included a nine-headed serpent and the three-headed dog that guarded the gates of the underworld. Another task was to steal golden apples that were said to make people live forever. He also had to



Heracles was a hero in ancient Greek mythology.

wash horse stables that had not been cleaned in 30 years. In addition, he had to get the belt of Hippolyta. She was the queen of the Amazons, a group of women warriors.

Heracles was not brilliant. But he was determined and strong. He accomplished all 12 labors. He even showed great cleverness at times. For example, to clean the filthy stables, he changed the paths of two rivers. The rivers washed the stables in a single day.

► More to explore

Hera • Mythology • Zeus

Herb

Herbs are the fragrant leaves or other parts of certain plants. These plants are also known as herbs. Common herbs include mint, basil, oregano, bay, parsley, and thyme. People use herbs, dried or fresh, to add flavor and aroma to foods. Herbs are also used in some cosmetics, teas, and medicines. People sometimes use the word spices to describe dried herbs.

Most herbs grow in mild climates. However, herbs can be planted wherever the growing conditions are good. Many people grow herbs indoors. In general, herbs grow well in dry, well-drained soil. Many require a lot of sun. Natural fertilizers, such as manure or compost, help herbs to form the oils that give them their flavor.

Most herbs come from the leaves of a plant. Bay leaves come from an evergreen tree called the bay laurel. Rosemary and sage are the leaves of bushes. Some herbs come from other parts of a plant. Ginseng comes from the roots of ginseng plants. All parts of the fennel plant can be used as flavoring.

Did You Know?

The banana plant is often called a tree but is actually a giant herb.



Herbs can be grown both indoors and outdoors.

People have used herbs for thousands of years. Early doctors used herbs to treat many illnesses. By the Middle Ages (about AD 500 to 1500), many Europeans were using herbs in their cooking. When the first settlers came from Europe to North America, they brought these herbs with them. Native Americans taught the settlers about the herbs growing in the Americas.

► More to explore

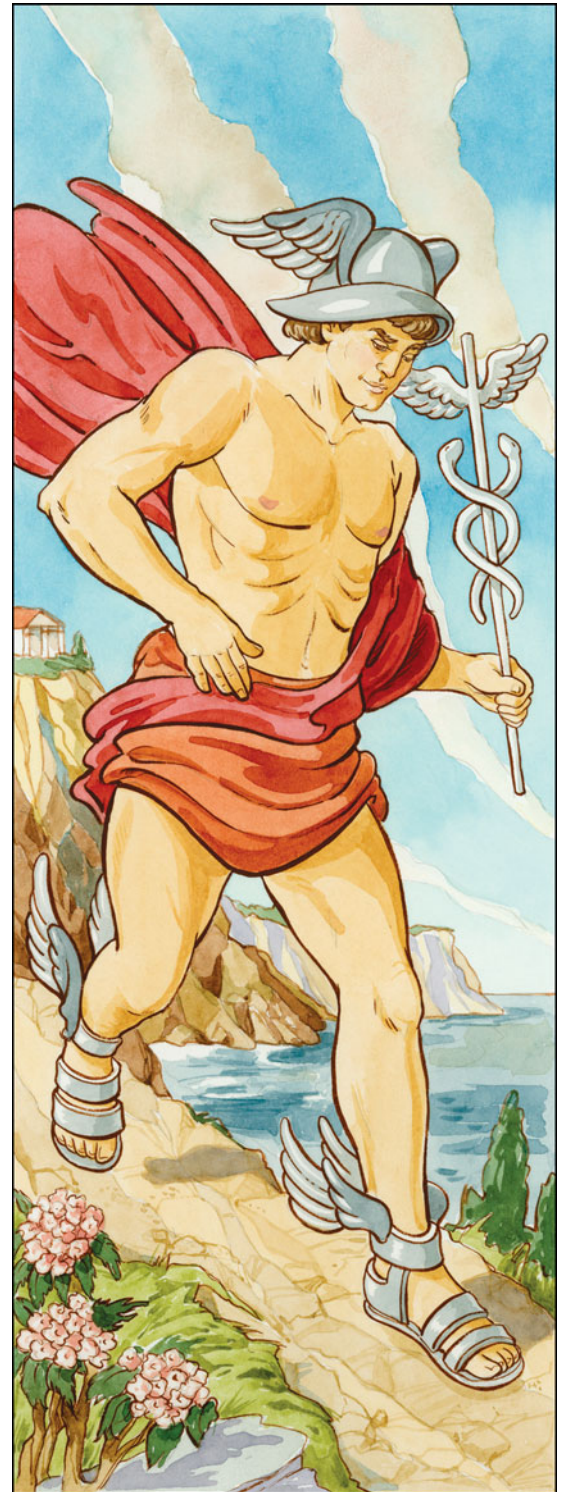
Spice

Hercules

► see Heracles.

Hermes

In ancient Greek mythology Hermes was the messenger of the gods. Zeus, the chief god, often sent him on errands. Hermes was one of the 12 major gods believed to live on Mount Olympus. He was associated with the Roman god Mercury because they shared many of the same



Hermes was the messenger of the gods of ancient Greece.

traits. Artists often pictured Hermes wearing a winged hat and winged sandals. These items were symbols of his great speed.

Hermes was the son of Zeus and Maia, a Titan. The Titans were giants who once ruled the world. Hermes had many roles in Greek mythology besides being the messenger god. It was said that Hermes led people down to Hades, or the underworld, after death. He was also considered the god of travelers, business, good luck, and thieves.

Hermes was said to be sly and deceitful. According to one story, when Hermes was only a few hours old, he stole cattle from the god Apollo. Zeus told Hermes to give the cattle back. Instead, Hermes played a stringed instrument called a lyre, which he had invented. Apollo loved his playing so much that he let Hermes keep the cattle in exchange for the lyre.

► More to explore

Apollo • Hades • Mythology

Heron

Hérons are long-legged birds typically found in ponds, marshes, and swamps. They also live along coasts and freshwater lakes and streams. Herons are wading birds, which means they feed while standing or walking in shallow water. They are found nearly all over the world, especially in warm regions.

There are about 60 species, or types, of heron. Several types of heron are called egrets. Herons are in the same family as bitterns. They are also related to storks, ibises, and flamingos.

A heron is typically a tall bird with broad wings and a long neck. Unlike most other birds, a heron flies with its head held back against its body. Its bill is long, straight, and pointed. Herons often have gray, brown, black, or white feathers. Most egrets are white.

The largest heron is the goliath heron, which is about 59 inches (150 centimeters) long. The great blue heron is slightly smaller. On the other hand, the green heron is only about 20 inches (51 centimeters) long.

Most herons feed during the day. However, the types called night herons are active mainly at night. Most kinds of heron stand still like a statue in the



The great blue heron is one of the best-known types of heron. It has a wingspan of 6 feet (1.8 meters) or more.

water while looking for food. When they spot a fish, frog, or other small water animal, they jab their spearlike bills into the prey.

► **More to explore**

Bird • Flamingo • Ibis • Stork

Hestia

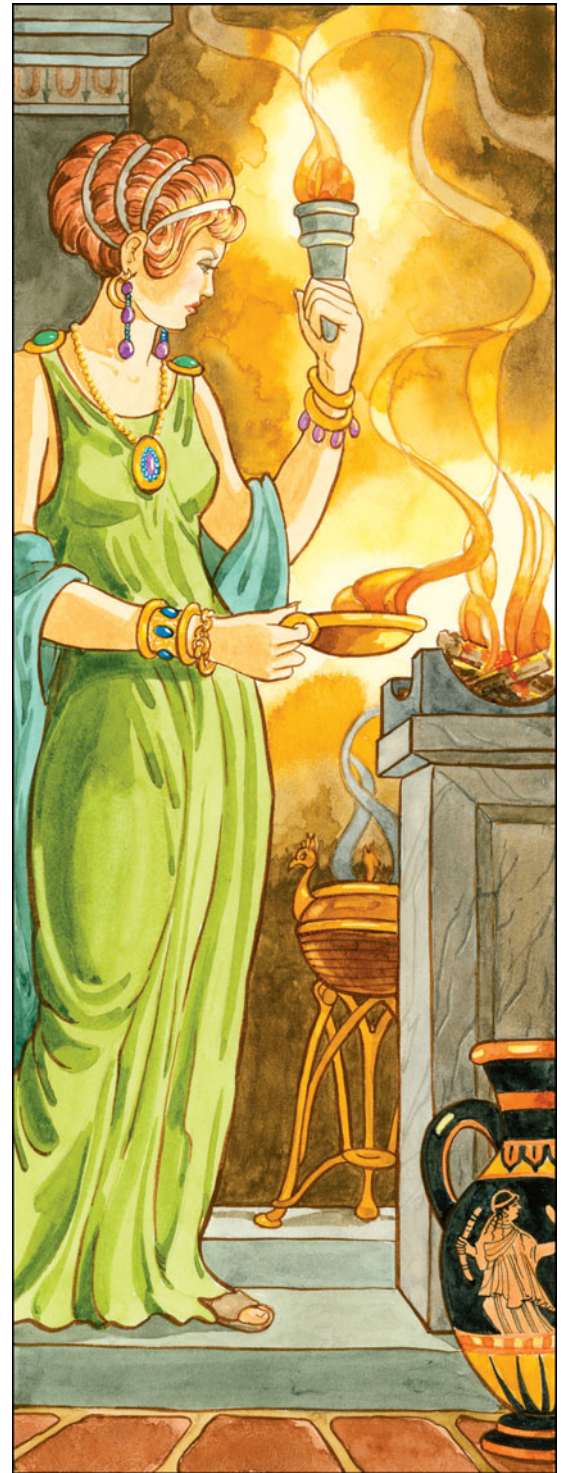
In ancient Greek mythology Hestia was the goddess of the home. She was also the goddess of architecture. Hestia was one of the 12 main gods believed to live on Mount Olympus. Unlike other Greek gods and goddesses, she was admired more for her virtues than her adventures. She was kind, generous, peaceful, and, above all, welcoming to visitors.

Hestia was the eldest daughter of Cronus and Rhea, who were Titans. The Titans were giants who once ruled the world. When Hestia became a young woman, the gods Apollo and Poseidon both wanted to marry her. Hestia refused their offers and swore to remain unmarried forever. She lived on Mount Olympus and dedicated herself to making others feel welcome and comfortable. She tended the eternal flame that burned on Mount Olympus.

In the center of every ancient Greek home, the hearth (or fireplace) was dedicated to Hestia. Most ancient cities also dedicated hearths to Hestia in town halls. When a family moved to a new home, a woman brought fire from her mother's hearth to light her own. Likewise, new communities brought torches from their former cities to light their

Did You Know?

Vesta was the ancient Roman goddess who was the most like Hestia.



Hestia was the goddess of the home.

new hearths. This tradition still survives today in a popular symbol—the Olympic torch.

► **More to explore**

Mythology

Hiawatha

Hiawatha was a legendary Native American leader. He helped five warring Indian nations—the Cayuga, the Mohawk, the Oneida, the Onondaga, and the Seneca—join together in peace. Their alliance was called the Iroquois Confederacy.

Little is known for sure about Hiawatha's life. He probably lived in the late 1500s, but some scholars think that he lived during the 1400s. Hiawatha may have been a member of either the Onondaga or the Mohawk tribe. Both tribes lived in what is now the northeastern United States.

The times were violent and dangerous for Hiawatha's people. Wars with other Native Americans and fighting between families caused much death and suffer-

ing. According to legend, a Huron prophet named Dekanawidah visited Hiawatha and inspired him to work for peace. Hiawatha asked the leaders of the warring nations to form an alliance. They accepted Hiawatha's plan and formed a peaceful union.

Although historians disagree about Hiawatha's exact role in the Iroquois Confederacy, the five nations did join together during the 1400s or 1500s. The strong alliance protected all the nations from attacks by outsiders. The Iroquois Confederacy stayed together until the American Revolution (1775–83) split it apart. Iroquois people today still respect Hiawatha as an important early leader.

► More to explore

Iroquois • Native Americans

Did You Know?

Legend says that Hiawatha was a powerful magician who taught his people how to practice medicine and to write using pictures.



A statue of Hiawatha stands in Ironwood, Michigan.

Hibernation

Hibernation is a way that some animals deal with the harshness of winter. They curl up in a safe place and stay there until winter ends. Hibernating animals seem almost dead. They barely breathe, and their body temperature is near the freezing mark. In warmer weather they return to their regular activities.

Animals that hibernate are called hibernators. They include bats, hedgehogs, ground squirrels, groundhogs, and marmots. Some animals are inactive in the winter but are not true hibernators.

How Animals Hibernate

Hibernators like dark, quiet winter homes. Some go underground or into



A small mammal called a dormouse hibernates in its nest.

caves. They may line their hibernation place with leaves, grass, hair, and other materials.

Hibernators prepare for winter with extra eating. They store fat to keep them alive during the months when they do not eat. The animal's body breaks down the fat when it needs energy. Some hibernators collect and store food before hibernating. At times during hibernation, these animals arise to eat.

A hibernator's body responds to weather conditions. If the weather becomes too cold, the animal needs to move around to raise its body temperatures. An animal that does not do this may die. Warmer temperatures tell an animal to come out of hibernation.

How Hibernation Differs from Sleep

Many animals save energy in the winter by sleeping more, but these animals are not truly hibernating. When an animal just sleeps, its body temperature does not

drop much. In addition, noise can wake a sleeping animal but not a hibernator.

Bears are an example of animals that change their activities in the winter but are not true hibernators. They spend most of the winter asleep, but their body temperature barely drops. A bear will move around if woken up. Also, females give birth and nurse during this time.

Other Forms of Hibernation

Only certain mammals are true hibernators. But other kinds of animals do something similar. Many reptiles and amphibians of mild climates become inactive in winter. Frogs and toads rest in holes or in mud at pond bottoms. Snakes may crowd together in caves. Many insects and spiders are frozen solid during the winter.

► More to explore

Amphibian • Animal • Mammal
• Reptile

Hickory

Hickory is the name of a group of similar trees, all belonging to the walnut family. More than 15 different species, or types, of hickory grow in eastern North America. Three species grow in eastern Asia. Some of the best-known hickories are shagbark, shellbark, mockernut, and pecan.

Most hickories grow to about 100 feet (30 meters) tall. They have a long taproot, or main root that grows downward. Hickories have compound leaves,

Did You Know?

In zoos, many animals that normally hibernate stay active during the winter because of noise and light.



The shagbark hickory grows in the eastern half of the United States. It grows very slowly. It takes 200 to 300 years to grow to 80 to 100 feet (24 to 30 meters) tall.

or leaves made up of several parts called leaflets.

Hickory flowers have no petals. The flowers grow either in spikes or in long, thin clusters called catkins. The fruit has a fleshy husk with a hard pit inside. The pit contains the fruit's seed, which is commonly called a nut.

Many types of animals eat the nuts of hickories. People also eat hickory nuts, especially pecans. People grow pecan trees for their nuts and for their light-colored wood. They use hickory wood for fuel, tools, furniture, and flooring.

Hickory trees have a place in U.S. history. Native Americans ground hickory nuts into flour for making bread. They also used hickory-nut oil for cooking.

Pioneers used the trees' wood to make ax handles, wagon wheels, and axles. They burned hickory in their woodstoves, both for cooking and for keeping warm. They enjoyed the flavor of hickory-smoked meats, just as many people do today.

► More to explore

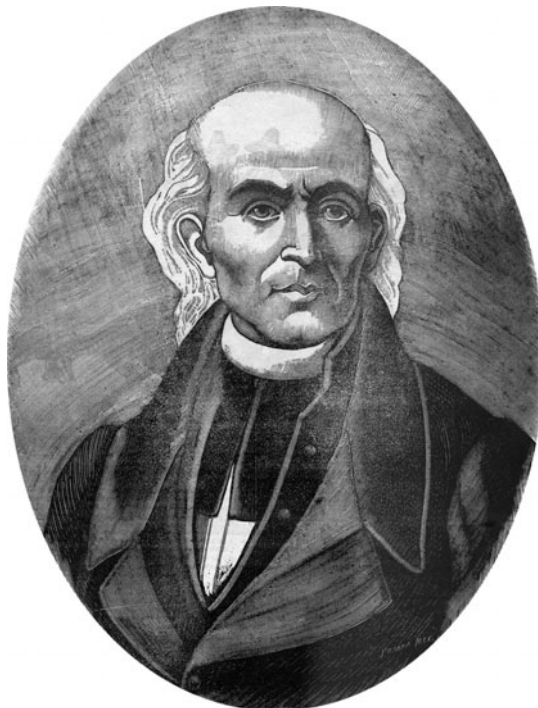
Nut • Tree

Hidalgo y Costilla, Miguel

Miguel Hidalgo y Costilla is known as the Father of Mexican Independence. In the early 1800s he led a major uprising against Spain, which then ruled Mexico.

Early Life

Hidalgo was born on May 8, 1753, near Guanajuato, Mexico, northwest of



Miguel Hidalgo y Costilla

Mexico City. He earned a degree in theology, or religion. In 1778 he became a Roman Catholic priest.

Father Hidalgo worked as a priest in the town of Dolores. He worked to improve the lives of the people there. He taught them new farming techniques. He also helped them to start pottery and brick-making businesses.

Fight for Independence

In 1808 France invaded Spain. The French forced the Spanish king to step down. These events encouraged many poor Mexicans to begin fighting for independence from Spain. Spanish soldiers fought back fiercely. They destroyed many Mexican farmlands.

Moved by the problems of his people, Father Hidalgo joined the fight for independence. On September 16, 1810, he rang a church bell and called the people to revolt against Spain. His call became known as the Grito de Dolores (the cry of Dolores). Thousands of Mexicans joined Hidalgo to march against the Spanish.

Hidalgo and his army of rebels won a number of battles. In the end, however, the Spanish defeated them. The Spanish captured Hidalgo on March 21, 1811. On July 31 they put him to death for being a traitor.

Ten years later Mexico finally won its independence from Spain. But Mexicans did not forget that Hidalgo had started it all. Mexico still celebrates its Indepen-

dence Day on September 16—the date of Hidalgo’s cry for freedom.

► More to explore

Mexico

Hidatsa

The Hidatsa are Native Americans of North Dakota. They have lived along the Missouri River for hundreds of years. Early European traders mistakenly thought that the Hidatsa were related to the Gros Ventre people. The traders used the name Gros Ventre for the Hidatsa as well. The Hidatsa are still sometimes called the Gros Ventre of the Missouri.

The Hidatsa traditionally lived in dome-shaped homes called lodges. They built their lodges by covering a wood frame with dirt. The Hidatsa grew corn, squash, and beans. They also hunted bison (buffalo) on horseback.



The Hidatsa wore clothing made from bison skins. The clothing was usually decorated with paint.

Did You Know?

Every Mexican Independence Day, the Mexican president shouts a version of Hidalgo’s Grito from the balcony of the National Palace.

By the late 1700s French and English traders were visiting the Hidatsa. The tribe's villages became a major trading center. The Hidatsa gave the Europeans horses, animal hides, and coats and blankets made from bison skins. In return they received guns, knives, and other goods.

The Europeans also brought diseases such as smallpox and measles. In 1837 smallpox almost wiped out the Hidatsa. The survivors came together to live in a single village. By 1862 the Mandan and the Arikara had joined them.

In 1870 the U.S. government set up the Fort Berthold Reservation in what is now North Dakota. The Hidatsa, the Mandan, and the Arikara lived there together. In 1934 the tribes became known as the Three Affiliated Tribes. At the end of the 20th century there were about 600 Hidatsa living in the United States.

► More to explore

Arikara • Gros Ventre • Mandan
• Native Americans

Hieroglyphics

Hieroglyphics is a writing system that uses pictures and symbols instead of letters and words. It is most often associated with the ancient Egyptians. However, other groups, including the Maya, used similar writing systems.

Each symbol in hieroglyphic writing is called a hieroglyph. The word hieroglyph means “holy carving.” The Egyp-



Hieroglyphs often decorated the tombs of important ancient Egyptians. Queen Nefer-tari's tomb has hieroglyphs and a picture of her playing chess.

tians used hieroglyphs on their temple walls and public monuments. They carved them in stone but also painted them on wood and other smooth surfaces.

Hieroglyphs were used in several ways. Some represented the objects that they depict. For example, the word sun would be represented by a large circle with a smaller circle in its center. Other hieroglyphs represented ideas that were associated with the picture. The sign for “sun” might serve as the sign for “day.” Hieroglyphs could also stand for particular sounds or groups of sounds.

Hieroglyphics developed thousands of years ago. By 2900 BC, the Egyptians were using hieroglyphic writing. It remained in use for more than 3,000 years. During the AD 100s and 200s,

many Egyptians became Christians. Egyptian Christians used the Greek alphabet. Slowly, people stopped using hieroglyphics. Eventually, no one could read hieroglyphic writing anymore.

In 1822 a French scholar rediscovered the meaning of hieroglyphics. He did it by studying the Rosetta Stone. Soldiers had found the stone in 1799. The message on it was written in both hieroglyphics and Greek. The scholar could read Greek, so he could figure out what the hieroglyphs on the stone meant.

► More to explore

Egypt, Ancient • Writing

Hillary, Edmund

Edmund Hillary was a famous mountain climber and explorer. He and Tenz-



Edmund Hillary stands in front of an airplane that he used to explore Antarctica.

ing Norgay of Nepal were the first people to reach the top of Mount Everest, the highest mountain on Earth. They made their climb in 1953. Hillary later explored Antarctica.

Edmund Percival Hillary was born in Auckland, New Zealand, on July 20, 1919. He became interested in mountain climbing while in his teens.

In 1953 Hillary joined a group of climbers who planned to reach Everest's peak. The group left Kathmandu, Nepal, on March 10, 1953. On May 29, Hillary and Tenzing reached the peak.

Hillary stayed active after his historic climb. In 1958 he led the first trip since 1912 to reach the South Pole by land. In 1967 he was among the first people to climb Antarctica's Mount Herschel. In 1977 he traveled by boat up the Ganges River of India.

Hillary wrote many books about his adventures. He returned to Nepal several times but never climbed to the top of Everest again. He helped build schools, air strips, and health clinics for the Sherpa people of Nepal. He died on January 11, 2008, in Auckland.

► More to explore

Everest, Mount • Tenzing Norgay

Himalayas

The highest mountains on Earth are found in the Himalayas. This great mountain system of southern Asia stretches for about 1,550 miles (2,500



kilometers) from west to east. Most of the Himalayas lie within India, Nepal, and Bhutan. In the Sanskrit language of India, the name Himalayas means “abode of snow.” It refers to the vast, year-round snowfields on the lofty peaks.

Geography

No other mountain range on Earth compares to the Himalayas. Nine of Earth’s 10 highest peaks are Himalayan; the other, K2, is in the nearby Karakoram Range. The peak of Mount Everest, at 29,035 feet (8,850 meters) above sea level, is the highest point on Earth. It lies on the border between Nepal and Tibet. Nineteen major rivers, including the Indus, Ganges, and Brahmaputra, begin in the Himalayas.

People

Few people live in the highest parts of the Himalayas, where the climate is very harsh. More people live on the lower slopes and in the valleys. The people are a mix of ethnic groups. The Sherpa, who live to the south of Mount Everest, are famous as guides for mountain climbers.

Economy

Most of the people of the Himalayas support themselves by growing crops and raising animals. Rice, corn, wheat, millet, and sugarcane are among the major crops. Fruit orchards in some valleys produce apples, peaches, pears, and cherries. The Darjeeling district of northern India is famous for its tea.

History

Mountain climbers first turned their attention to the Himalayas in the 1880s. In the 1900s mountaineers climbed the highest Himalayan peaks for the first time. The New Zealander Edmund Hillary and the Sherpa Tenzing Norgay reached the summit of Mount Everest in 1953. The Himalayas challenge an increasing number of trekkers and climbers every year.

► More to explore

Everest, Mount

Hinduism

Hinduism is the world’s oldest major religion. Some traditions of Hinduism date back more than 3,000 years. Over the centuries, however, its followers—called Hindus—have accepted many new ideas and combined them with the old ones. More than 800 million people practice Hinduism worldwide. Most of them live in India, where Hinduism began.

Beliefs

Hinduism has neither a founder nor a central organization. No one has set

Did You Know?

In Hinduism the law of karma says that a person’s actions in the present life will affect the quality of the next life.

Some Important Hindu Holidays		
Holiday	Meaning	Date
Diwali	festival of lights; honors Laksmi, the goddess of wealth	October/November
Vasantpanchami	honors Sarasvati, the goddess of learning	February
Holi	festival of colors; celebrates spring	February/March
Dussehra	celebrates the triumph of the hero Rama over the evil Ravana	September/October
Note: Actual dates depend on the Hindu lunar (moon) calendar.		

down a list of beliefs for all Hindus to follow. But all Hindus revere the Veda, an ancient body of sacred writings.

Hindus believe in a spiritual power called Brahman. Brahman is the source of all existence and is present in every thing and every place. The human soul, called atman, is part of the universal Brahman. Hindus generally believe that when someone dies, the atman is reborn in another body. A soul may return many times in human, animal, or even plant form. This idea is known as reincarnation. The cycle of rebirth continues until one accepts that the atman and Brahman are one. Most Hindus consider breaking free from this cycle to be a person’s highest purpose.

Hindus are expected to act according to the principle of ahimsa, which means “nonviolence.” This means that one must never wish to harm anyone or anything. Hindus consider many animals to be sacred, especially the cow. Devout Hindus eat only vegetarian food.

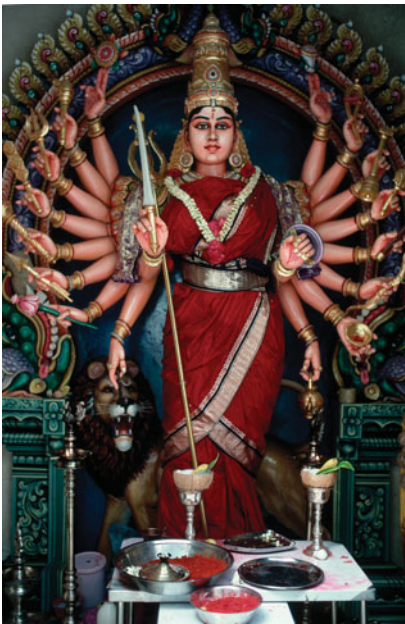
Hindus worship many gods. The god Vishnu is considered the protector and preserver of life. The god Siva represents the forces that create life as well as those that destroy it. The supreme goddess is

most commonly called Shakti. Like Siva, she can be either beneficial or fierce, depending on her form. The worship of Vishnu, Siva, and Shakti are the three major branches of modern Hinduism.

Brahma (not to be confused with Brahman) is considered the creator of the universe. In ancient times he was widely worshipped, but his following is now small.

Practices

In a form of worship called puja, Hindus pray for a god to enter a home or



A shrine in a Hindu temple honors Durga, one of the many forms of the goddess Shakti.

temple and then treat the god as an honored guest. They worship an image of the god and offer up food, water, and other items.

Tantrism is the search for spiritual knowledge and for release from the cycle of rebirth. It involves chanting sacred sounds and words called mantras and drawing symbols called mandalas.

Pilgrimages, or journeys to holy places, have been common in Hinduism since ancient times. Many pilgrimage sites lie along the Ganges River in northern India, which Hindus consider the holiest of rivers.

History

In about 1500 BC people called Aryans invaded India from what is now Iran. The Aryans composed the oldest writings in the Veda. They developed a religion, called Vedism, that centered on making animal sacrifices to the gods. Vedism was the starting point of Hinduism. But the influence of other peoples and ideas over the years made Hinduism a very different religion from Vedism. Over time, for example, people began to disapprove of the killing of animals as sacrifices. From the 100s BC to the AD 300s, the older gods of Vedism were slowly replaced by newer ones. But some rites of Vedism have survived in modern Hinduism.

In the 1000s Muslims invaded northern India and Islam influenced some new schools of Hinduism. In the late 1400s a new religion, Sikhism, combined Hindu and Islamic elements.



Hindu children in Kolkata, India, participate in the colorful festival of Holi. Holi is a celebration of spring.

In the early 1800s Great Britain began making India into a colony. In reaction to foreign rule, Hinduism underwent a revival. It helped unify Indians against the British. Also during this period, however, some Hindu leaders began criticizing elements of traditional Hinduism. The reformer Ram Mohun Roy, for example, spoke out against the ancient form of social organization called the caste system. Under this system, people were treated differently depending on which social class they were born into. The reformers used some Western ideas to make Hinduism more modern.

The most famous Hindu leader of the 1900s was Mahatma Gandhi. He brought the idea of ahimsa into politics. He helped win India's independence from Britain using only nonviolent methods.

Differences between Hindus and Muslims grew after the colony of British India was divided into the independent

countries of India and Pakistan in 1947. Millions of Hindus left their homes in Pakistan for India, and millions of Muslims left India for Pakistan. Many Hindus and Muslims were killed. In India and elsewhere, violence between Hindus and Muslims continued into the 21st century.

► **More to explore**

Caste • Gandhi, Mahatma • Ganges River • India • Pilgrimage • Sikhism • Veda

Hinton, S.E.

S.E. Hinton is an author of popular fiction for young adults. Her realistic way of describing teenage life has brought her fans worldwide. Hinton has also published books for younger children and adults.

Hinton's full name is Susan Eloise Hinton. She was born in Tulsa, Oklahoma,



S.E. Hinton

on July 22, 1950. As a child she loved reading, especially animal stories. At age 16 Hinton wrote *The Outsiders*, the story of two rival high school groups. A friend's mother helped Hinton publish the book. It remains Hinton's most famous and best-loved novel.

Hinton later wrote more novels for teenagers. They included *That Was Then, This Is Now*; *Rumble Fish*; *Tex*; and *Tamming the Star Runner*. Like *The Outsiders*, these novels deal with teenagers in tough situations. Hinton's first four novels were later made into movies.

In the 1990s Hinton wrote *Big David*, *Little David* and *The Puppy Sister* for younger readers. She published *Hawkes Harbor*, a novel for adults, in 2004.

► **More to explore**

Fiction

Hip-Hop

Hip-hop is a type of music. It is also a culture, or way of life. It includes many types of expression—for example, rapping, deejaying, dancing, and graffiti painting. Fans of hip-hop culture also wear certain styles of clothing.

Hip-hop music often has heavy beats and electronic sounds. It may also include other musical styles, such as jazz or rock and roll. Rap is usually set to hip-hop music. Rap is speech that has a rhythm and rhymes.

Another part of hip-hop music is deejaying. Deejays change the sound of



Hip-hop artist Kanye West performs in Los Angeles, California.

recorded music in various ways. They may mix songs together or speed up or slow down a song's beat.

New styles of dancing developed along with hip-hop music. Break dancing was one of the earliest styles. Break dancing is acrobatic. It includes such moves as spinning on the back and springing from the ground on the arms.

Many young people copy the clothing styles of hip-hop stars. Some popular hip-hop styles have been oversized T-shirts, baggy pants, gym shoes, and large jewelry.

The hip-hop movement began in poor, mostly African American, parts of New York City in the 1970s. Young African Americans gathered at parties, where they developed rapping, deejaying, and break dancing.

The first rap song to become a national hit was "Rapper's Delight" by the Sugarhill Gang. It came out in 1979. The song helped to spread hip-hop culture throughout the United States and the

rest of the world. Later hip-hop artists included Run-D.M.C., LL Cool J, De La Soul, Queen Latifah, Ice Cube, Snoop Dogg, the Beastie Boys, Missy Elliott, Kanye West, and Sean Combs (known as P. Diddy, or Diddy).

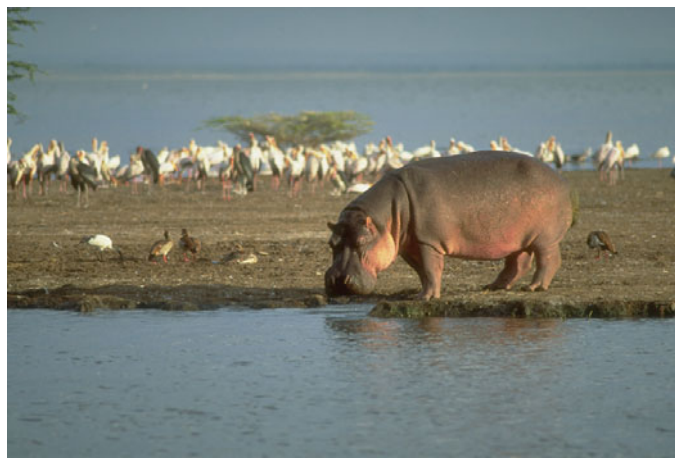
► More to explore

Popular Music • Rap

Hippopotamus

The hippopotamus is a huge mammal that lives in eastern Africa. It spends most of its time in rivers, lakes, and swamps. The hippopotamus is related to pigs. Its scientific name is *Hippopotamus amphibius*.

Hippopotamuses have a barrel-shaped body. They are about 11.5 feet (3.5 meters) long and weigh more than 7,000 pounds (3,200 kilograms). Their hide is very thick. It is grayish brown and almost hairless. Their skin releases an oily substance that looks red in sunlight. Scientists think that this substance acts as sunscreen.



Hippopotamuses live in and around water. The name hippopotamus is Greek for "river horse."

Did You Know?

Because of the oily red substance on a hippopotamus's skin, people used to think that the animal sweated blood.

Hippopotamuses spend the day resting in shallow water. They often sleep with just their eyes, ears, and nose above the water. A hippopotamus can also dive down and walk on lake and river bottoms. It can keep its head underwater for 5 to 10 minutes before coming up to breathe. At night hippopotamuses go onto land to eat grasses.

The pygmy hippopotamus is a close relative. It is very rare. It lives only in a small part of western Africa. Pygmy hippopotamuses are much smaller than other hippopotamuses. The largest weigh about 590 pounds (270 kilograms). They spend less time in the water than the larger hippopotamuses.

► More to explore

Mammal • Pig

Hiroshima

The city of Hiroshima is a port on the island of Honshu in Japan. It was the first city ever to be struck by an atomic bomb.

Hiroshima was founded as a castle town in the 1500s. Beginning in the 1860s it was a military center. On August 6, 1945, in the last days of World War II, the United States dropped the atomic bomb. Much of Hiroshima was destroyed. More than 70,000 people died right away. Radiation left by the bomb killed many more people later on.

Hiroshima was rebuilt after the bombing. It is now a large industrial city. Factories in the city produce steel,



People leave artwork and origami (folded paper) objects at the Peace Memorial Park in Hiroshima, Japan. Origami in the shape of a crane is a symbol of peace.

automobiles, rubber, chemicals, ships, and machinery.

The place in Hiroshima where the bomb exploded is now a park called Peace Memorial Park. It has a museum and monuments to the dead. The Atomic Bomb Dome is the ruins of one building that was left partially standing after the blast.

► More to explore

Bomb • Japan

Hispanic Americans

Hispanic Americans are people living in the United States who are descendants of Spanish-speaking peoples. Most Hispanics are from (or have ancestors from) Latin America. For this reason, they are often known as Latinos. Latin America includes Mexico, Puerto Rico, Cuba, and the countries of South and Central

America. In addition, some Hispanics have ancestors who are African, American Indian, or European.

Hispanics are the largest and fastest-growing minority group in the United States. But Hispanics do not always think of themselves as a single group. Instead, many Hispanics identify with the country or area that they or their ancestors are from. Today more than half of all Hispanics are Mexican Americans. People with roots in Puerto Rico, Cuba, El Salvador, or the Dominican Republic make up the next largest groups of Hispanics.

Coming to the United States

Hispanics have moved to the United States for different reasons. Some have come to escape poverty and find better job opportunities. Others have fled political problems and wars in their home countries. In the case of many



Alberto R. Gonzales, a Mexican American lawyer, became the U.S. attorney general in 2005. The attorney general is the head of the Department of Justice.



A *quinceañera* is a Mexican American celebration of the 15th birthday of a girl.

Mexican Americans, their ancestors were already living in the Southwest before it became part of the United States.

Mexican Americans

In the 1500s Spain conquered what is now Mexico and made it a Spanish colony. Spain also conquered what is now the southwestern United States. The Spanish ruled this territory as a part of Mexico. After the Mexican War of 1846–48, the territory became a part of the United States. Many of the people there spoke Spanish. Their descendants are Mexican Americans. So are the many Mexicans who have immigrated, or moved, to the United States since then.

Puerto Ricans

The United States took over the island of Puerto Rico after the Spanish-American War of 1898. In 1917 Puerto Ricans became U.S. citizens. By 1940 there were nearly 70,000 Puerto Ricans

living in the mainland United States. Puerto Ricans can move freely between the mainland and the island. However, the U.S. Census Bureau counts only those Puerto Ricans living on the mainland as Hispanic Americans.

Cubans



English and Spanish signs mark a street corner in the Cuban American section of Miami, Florida. The neighborhood is called Little Havana because Cuba's capital is Havana.

Large numbers of Cubans moved to the United States after a new leader named Fidel Castro took power in 1959. Many of these immigrants were middle-class shop owners, businesspeople, and professionals. They were afraid that Castro would change their way of life. The U.S. government treated these immigrants as refugees, or people seeking protection from their home country's government. After the 1950s Cubans continued to move to the United States.

Central Americans

From the 1970s to the 1990s a new wave of immigrants came to the United States from Central America. These immigrants were from countries that were involved in civil wars, such as Nicaragua, El Salvador, and Guatemala. Hundreds of thousands of people moved to the United States (and other nearby countries) to escape violence at home.

Important Issues

Migrant Workers

Migrant farmworkers are people who move from place to place to harvest crops. Migrant workers first came from Mexico to work in U.S. cotton fields after the American Civil War (1861–65). Hispanic migrant workers soon became an important part of U.S. farming. However, they usually received low pay and suffered harsh working conditions.

In the 1960s a former migrant worker named Cesar Chavez helped migrant workers to form groups called labor unions. He organized a five-year strike by migrant grape pickers in California. This meant that the grape pickers refused to work until they got better treatment. Chavez also convinced many Americans to stop buying California grapes.

Chavez helped to improve the lives of many Hispanic migrant workers. However, migrant workers today still earn less than other U.S. workers.

Illegal Immigration

Most people who have immigrated to the United States have done so legally. However, more people want to move to the United States than U.S. laws allow. Therefore, some people enter the country without permission. These people are called illegal immigrants or illegal aliens. In the early 21st century there were probably more than 10 million such people in the United States. More than half were from Mexico. About one quarter were from other Latin American countries.

Americans disagree about whether this illegal immigration is helpful or harmful to the United States. Some believe that illegal immigrants help the economy. They do this by taking low-paying jobs that other Americans do not want. Others think it is unfair that the states must pay for public services for people who immigrated illegally. For example, states must pay for the education of children of illegal immigrants.

Bilingualism

Many Hispanic Americans can speak both Spanish and English. This ability is called bilingualism. But many new immigrants—and their children—speak only Spanish at first. Some Americans think that schools should teach Spanish-speaking children in Spanish until they learn English. Other Americans, however, think that schools should teach Spanish-speaking children in English, along with the English-speaking children.

Hispanic Americans Today

By 2004 there were more than 41 million Hispanic Americans in the United States. They made up about 14 percent of the U.S. population.

Many Hispanics are proud of their roots. They want to pass their culture and the Spanish language on to their children. At the same time, Hispanics are an important part of U.S. society as a whole. In 2009 Sonia Sotomayor became the first Hispanic justice of the United States Supreme Court.

► More to explore

Castro, Fidel • Census • Central America • Chavez, Cesar • Cuba • Mexican War • Mexico • Migration, Human • Puerto Rico • Refugee • South America • Spanish-American War

History

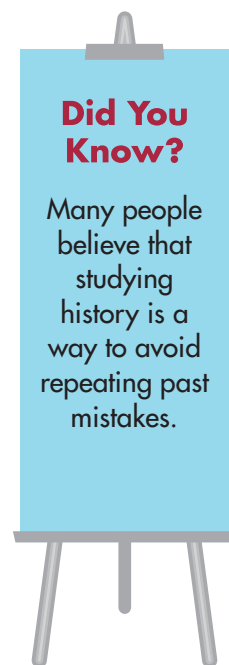
History is the study of the past. The study of history helps make sense of humankind. It also helps people understand the things that happen today and that may happen in the future.

People trained in history are called historians. Historians usually choose a particular time period or a particular group of people to study. They may write books and articles to help other people understand the past. They often use written records such as diaries, letters, and newspaper articles to learn about the past.

Today records are easy to get. They are mostly written on paper or stored on

Did You Know?

Many people believe that studying history is a way to avoid repeating past mistakes.





An English scholar named Bede was an early historian. In the 700s he wrote a history of the English people up to that time. His book is now part of history itself. A page from the work shows what books were like at that time.

computers. But records from long ago may have been written on stone or drawn on buildings. These records may be buried in the ground, partially destroyed, or covered in layers of paint. Historians who study ancient time periods must uncover these records.

Historians may also use the tools of archaeology to study ancient times. Archaeology is the study of the things that ancient people made, used, and left behind. Some people a long time ago did not have a way to write things down. But historians and archaeologists still learn much about the way these ancient people lived. They do this by studying the tools, homes, clothing,

weapons, and other objects that the ancient peoples used or owned.

► More to explore

Archaeology • Writing

Hitler, Adolf

Adolf Hitler ruled Germany from 1933 to 1945. He called himself Führer (Leader). Hitler believed that Germans were born to rule over other peoples. This led to World War II. He also believed that there was no place in society for Jewish people. This idea led to the Holocaust, when millions of Jews were killed.

Early Life

Adolf Hitler was born into a German family on April 20, 1889, in Braunau am Inn, Austria. He grew up in Linz, Austria. In about 1913 Hitler moved to Munich, Germany. When World War I began in 1914, he joined the German army.



Adolf Hitler

After the war Hitler joined a tiny political group in Munich. In 1921 Hitler took control of the group. By then it was known as the Nazi Party. In the 1920s he published his autobiography, *Mein Kampf*, meaning “My Struggle.”

The Third Reich

By 1932 the Nazi Party was the largest party in the Reichstag (Germany’s law-making assembly). Hitler became chancellor, or leader, of Germany in 1933. In 1934 he took complete control. He created what he called the Third Reich, or empire.

Hitler soon put his beliefs into practice. Soon Jews were not allowed to own businesses or attend certain schools. Many were arrested and sent to concentration camps. Hitler also strengthened Germany’s military power.

World War II and the Holocaust

Hitler then moved to enlarge the Third Reich. He took over neighboring countries. When Germany invaded Poland in September 1939, World War II began.

During the war Hitler stepped up his campaign against the Jews. The Nazis killed many in the concentration camps. Others died while working as slave laborers. Eventually some 6 million Jews died in the Holocaust.

By 1944 the war was going badly for Hitler. Hitler killed himself on April 30, 1945, in Berlin, Germany. Germany

surrendered, and the war in Europe ended on May 8.

► More to explore

Germany • Holocaust • Nazi Party
• World War II

Hobby



Stamp collecting is a popular hobby. Philately is another word for stamp collecting.

A hobby is a fun activity based on a person’s interests. Many people practice hobbies during their time off from work or studying. Popular hobbies include drawing, collecting baseball cards, and building Web sites. A person with a hobby is called a hobbyist.

Types of Hobbies

Most hobbies involve collecting, creating, observing nature, or using special equipment. Many people collect stamps, coins, seashells, jewelry, or even action figures. Creative hobbyists enjoy arts

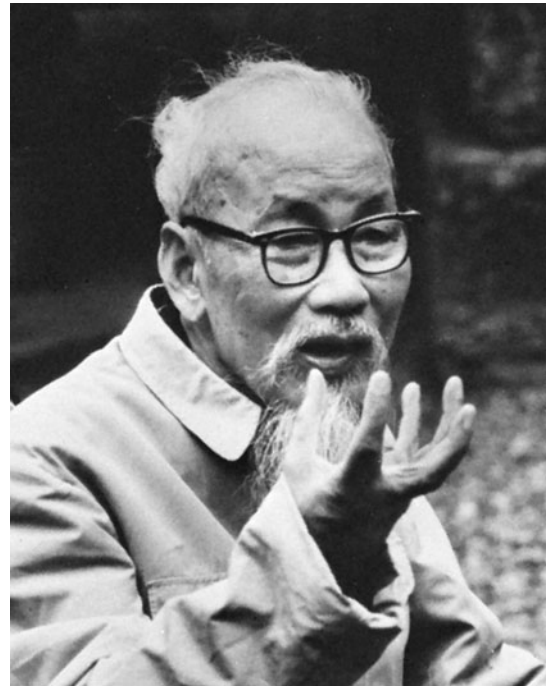
Did You Know?

Hobbies can lead to careers. A child who likes to collect rocks could one day become a geologist.

and crafts—for example, painting, singing, writing, carving, sewing, or building models. Hobbies for people who enjoy nature include bird-watching and gardening. Photography, ham radio (amateur radio), and computer programming are hobbies that require equipment. Many hobbies are done alone, but people often form groups or read magazines based on their hobby. No matter what the hobby, there is always an opportunity to learn from it.

History

Before the 1900s most people spent nearly all their time working and caring for their families. Only wealthy people could afford to have hobbies. After the Industrial Revolution, modern technology and machines gave people more spare time, so more people developed hobbies. In the late 20th century computers created a whole new class of hobbies. Many people today spend their spare time surfing the Internet and playing video games.



Ho Chi Minh

Indochina, which was a colony of France. As a young man, Ho worked as a seaman and traveled widely.

Career

While living in Paris, France, Ho became a Communist. Communism is a political system in which the common workers are important.

In 1930 he helped organize a Communist party in Vietnam. The French government did not want him in Vietnam, so he lived in other countries. In about 1940 he began to use the name Ho Chi Minh, which means “he who enlightens.”

In 1945, during World War II, the Japanese took Vietnam from the French. Then the United States defeated Japan. Ho declared Vietnamese independence on September 2, 1945. However, the

Did You Know?

While he lived in France, Ho Chi Minh was known as Nguyen Ai Quoc (“Nguyen the Patriot”).

Ho Chi Minh

Ho Chi Minh was a powerful leader of Vietnam during a troubled period of that country’s history. Ho fought to make Vietnam a united, independent, and Communist country. After his death this dream came true.

Early Life

Ho Chi Minh was born on May 19, 1890, in Hoang Tru, Vietnam. His original name was Nguyen Sinh Cung. Vietnam was then part of French

French soon took back control of southern Vietnam. Ho's forces finally defeated the French in 1954. But Vietnam was then divided into two countries, North Vietnam and South Vietnam.

Ho was president of North Vietnam. An anti-Communist was president of South Vietnam. Ho wanted to reunite the two halves of Vietnam. Starting in about 1959, he supported a Communist rebellion in South Vietnam. The South Vietnamese fought back. This fighting became known as the Vietnam War.

Death and Legacy

Ho Chi Minh died on September 2, 1969, while the Vietnam War was still being fought. The Communists won control of all of Vietnam in 1975. They then changed the name of South Vietnam's capital city from Saigon to Ho Chi Minh City.

► More to explore

Communism • Vietnam • Vietnam War

Hockey, Ice

Ice hockey is a fast-moving team sport. It is usually played on an ice surface called a rink. Hockey players wear ice skates and move with great speed and skill across the ice. Two teams of six players compete to score the most points, or goals. A team scores when it moves the puck—a small, hard rubber disk—into the opponent's goal. Hockey is a rough sport, with a great deal of body contact between the players.

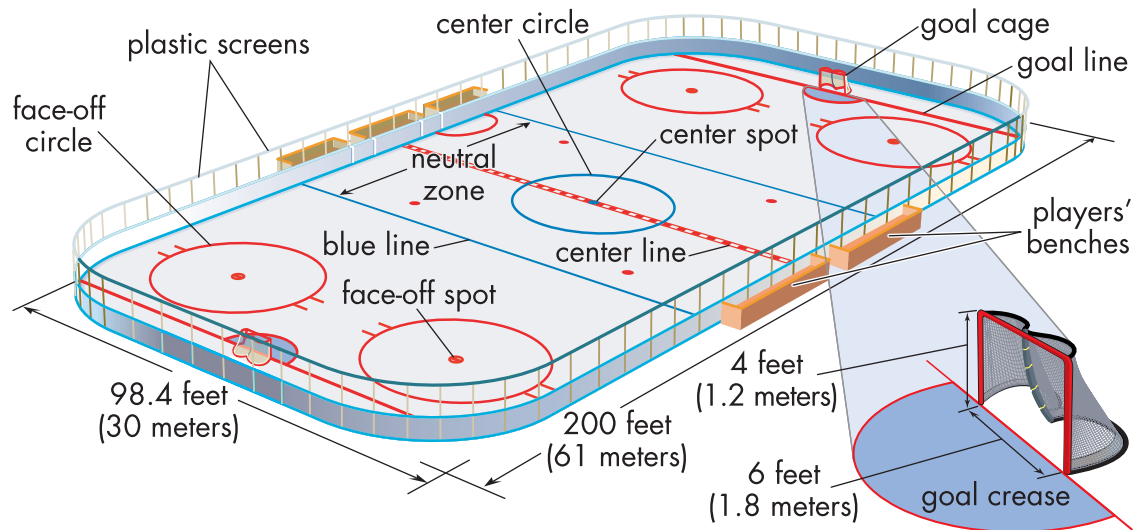
Playing Area and Equipment

A hockey rink is a rectangle with rounded corners. In international hockey the rink is 200 feet (61 meters) long and 98.4 feet (30 meters) wide. Professional hockey in North America is played on a narrower rink.

Several boundary lines run across the width of the rink. Two blue lines divide the rink into three zones. Between the



Children who live in cold climates often learn to play ice hockey.



The rinks for international hockey and the National Hockey League (NHL) are similar. However, an NHL rink is narrower than an international rink.

two blue lines, at the middle of the rink, is a red center line. At each end of the rink is a red goal line with a goal cage in the middle. The cage is 4 feet (1.2 meters) high and 6 feet (1.8 meters) wide. A net encloses the sides and back. The ice surface also includes markings for face-offs. A face-off is used to start or restart play after it has been stopped.

The hockey stick is the players' main tool. Hockey sticks are made from a variety of materials, such as wood or aluminum. A hockey stick is a long shaft with a flat-faced surface, called a blade, at one end. Players use the blade to hit the puck. The puck is 3 inches (7.6 centimeters) across and 1 inch (2.5 centimeters) thick.

Hockey players wear helmets and heavy padding to protect their bodies. The goalkeepers, or goalies, wear extra pads and gloves. They also wear special masks over their faces. The skates that players wear are specially designed for hockey.

Playing the Game

A hockey game is divided into three periods that are 20 minutes each. The game starts with a face-off in the center of the rink. During the face-off an official drops the puck between two opposing players. The players then use their sticks to try to get control of the puck for their team.

The team that gets the puck starts an offensive attack. The players may handle the puck only with their sticks. They can move the puck themselves or pass it to teammates. They try to get the puck to a player who has a good shot at the opponent's goal. Hitting the puck into the goal scores one point.

There are limits on how a team may send the puck down the ice. For example, a player may not cross the blue line near the opponent's goal until after the puck crosses the line. If this happens, the officials stop play. The game starts again with a face-off.

The team that does not have the puck tries to get it. Its players poke their stick at the puck. They try to steal passes and to block shots. Players often take the puck away from an opponent by using a hit to the body, called a check. But some kinds of body contact are against the rules. For example, a player cannot check another player from behind. This is called a penalty. Players who commit penalties sit in a penalty box, usually for 2 minutes. During this time their team plays one player short.

The players on a hockey team have different positions, or roles. In general, a team has a goalkeeper (usually called a goalie), two defensive players, and three forwards. The goalie tries to keep the puck out of his team's goal. The main job of the defensive players is to assist the goalie. The forwards mostly try to score goals.

History

Ice hockey developed in Canada from games played with sticks and a ball. The first use of a puck was recorded in 1860. In 1875 students at McGill University in Montreal, Quebec, played the first known indoor ice hockey game.

The International Ice Hockey Federation was started in Europe in 1908. Ice hockey became an event in the Olympic Games in 1920. Women's ice hockey was added to the Olympics in 1998.

In North America the National Hockey League (NHL) was created in 1917. The NHL has professional teams from Canada and the United States. At the

end of each NHL season, the league's best team is awarded the Stanley Cup.

► More to explore

Olympic Games • Skating

Hohokam Culture

The Hohokam culture was one of the first great Native American civilizations in what is now the United States. The Hohokam people lived in what is now Arizona from about 300 BC to about AD 1400.

The Hohokam got most of their food from farming. They grew corn, beans, pumpkins, and squash. They also grew cotton, which they wove into cloth. The soil where they lived was dry and sandy.



Rock carvings on a cliff in Phoenix, Arizona, show two people hunting animals. The Hohokam people carved these designs into the rocks hundreds of years ago.

Did You Know?

Snaketown has ruins of large ball courts. The Hohokam played a game similar to soccer using small rubber balls.

They built wide canals from the Gila and Salt rivers to their fields so they would have enough water for farming.

The largest Hohokam settlement is now known as Snaketown. It is located near Phoenix, Arizona. Early Hohokam lived in pit houses. They made these houses by digging a shallow pit and covering it with a dome of wood and mud. By about 1100 the neighboring Anasazi had taught the Hohokam how to build homes from bricks made of adobe (sun-baked clay).

During the early 1400s the Hohokam abandoned their villages. No one knows why they left or where they went. The people of two modern tribes—the Pima and the Tohono O’odham—are probably their descendants. The name Hohokam means “those who have gone” in the Pima language.

► More to explore

Anasazi • Native Americans • Pima
• Tohono O’odham

Holiday

► see Festival and Holiday.

Holland

► see Netherlands, The.

Holly

Hollies are shrubs and trees with green leaves and usually red berries. They are



American holly has prickly leaves and usually red fruits.

popular around Christmastime in Europe and North America. Hollies are often used to make wreaths. There are about 400 species, or kinds, of holly. Many of them are evergreens. Evergreens keep their green color throughout the year.

Hollies grow in the mild and tropical regions of North America, South America, and Asia. Different types of hollies vary in height and appearance. Some may grow to be about 50 feet (15 meters) tall. Others are dense shrubs that are no more than 20 feet (6 meters) in height.

Hollies generally have single leaves that grow on both sides of the branches. The small, greenish flowers develop into clusters of red, yellow, or black berries. The berries remain on the plant through most of the winter. Holly plants are either male or female. Usually only females produce berries.

People have used holly in celebrations, decorations, and religious ceremonies for hundreds of years. Today holly is used mostly for decoration. The leaves of one type, however, are used to make a tealike beverage called maté. In addition, the pale wood of some hollies is used to make furniture.

Holocaust

In 1933 the Nazi Party took control of the country of Germany. The Nazis hated Jewish people and tried to make life hard for them. Later, during World War II (1939–45), they decided to kill as many Jews as possible. Their program became known as the Holocaust. It took the lives of about 6 million Jewish men, women, and children.

Jewish people were not the only ones who died in the Holocaust. The Nazis also killed Roma (Gypsies), homosexuals, mentally and physically disabled people, and anyone who dared to speak out against them.

Anti-Semitism

Adolf Hitler was the head of the Nazi Party. He ordered acts of anti-Semitism (acts against Jews) as soon as he took power in 1933. Many Jews lost their jobs. In 1935 Jews lost their German citizenship.

On November 9–10, 1938, crowds burned synagogues (Jewish houses of worship) all over Germany. They also broke windows of shops owned by Jews. Instead of arresting the attackers, the



Nazis required Jews to wear identifying badges in World War II.

Nazis arrested thousands of Jews. They sent the Jews to concentration camps (large prison centers). The event was called Kristallnacht, or Night of Broken Glass.

By the time World War II began in 1939, Jews could not attend school or own businesses. In many areas, the Nazis made all Jews wear badges so they would not blend in with non-Jews. In some cities, the Nazis forced Jews to live in overcrowded areas called ghettos.

By late 1941, German victories in World War II put most European Jews under Nazi control. During this time the Nazis began to kill large numbers of Jews and other victims. Special units of soldiers rounded up Jews, shot them, and dumped the bodies in mass graves.

Opposition

Many Jews tried to get away from Germany even before the killings began. The family of the young diary writer Anne Frank moved to The Netherlands.

The Franks hid there for two years before the Nazis caught them. Other Jews escaped to the United States, Palestine (now Israel), and other countries.

Some people helped Jews to hide or to escape. Raoul Wallenberg, a Swedish man, saved 100,000 Jews in Hungary. Oskar Schindler, a German, protected 1,200 Jews who worked for him.

Final Solution

In 1942 the Nazis planned a “final solution” to what they called “the Jewish question.” They decided to kill all Jews in all areas controlled by Germany.

The Nazis built special death camps in Poland. Some of their names were Auschwitz, Majdanek, Treblinka, Chelmno, Sobibor, and Belzec. At the camps, the Nazis killed people with poison gas. They then burned the bodies. The Nazis kept some people alive to work as slaves. Many of these prisoners died of starvation or disease.



Visitors look out from the steps of a sculptural memorial at the Majdanek concentration camp in Poland.

Aftermath

The Holocaust came to an end when the Allies—the United States, France, Great Britain, and the Soviet Union—defeated Germany in 1945. Allied soldiers discovered the death camps and released the remaining prisoners.

The Allies also set up a court to try Nazi leaders for their crimes. The biggest trial took place in 1945–46 in Nuremberg, Germany. After this trial, seven Nazi leaders went to jail, and 10 were hanged.

Today many countries have Holocaust Remembrance days to remember the victims. Museums like the Holocaust Memorial Museum in Washington, D.C., educate people about what happened. Many people hope that learning about the Holocaust can prevent such a terrible thing from happening again.

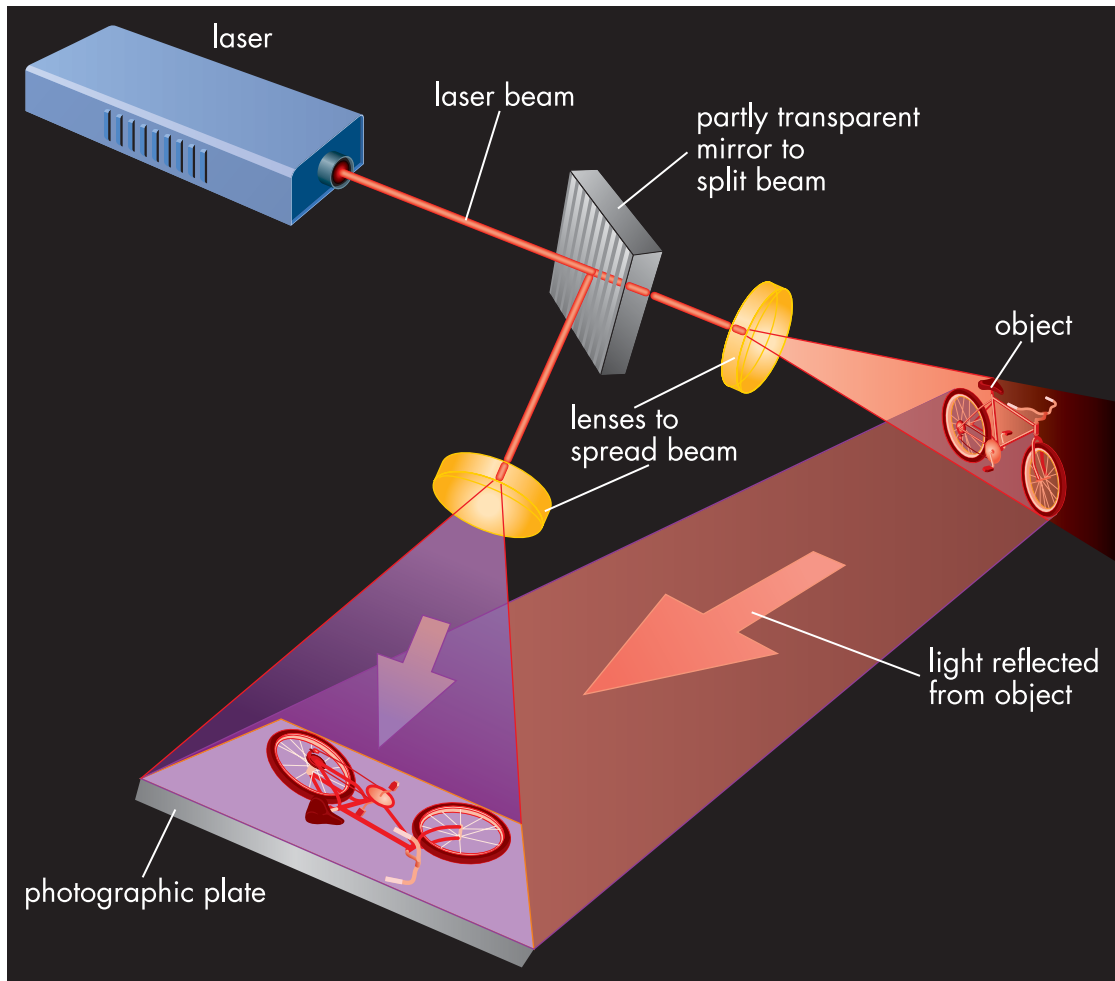
► More to explore

Frank, Anne • Hitler, Adolf • Judaism
• Nazi Party • World War II

Hologram

A hologram is like a three-dimensional photograph. Photographs show only height and width. Holograms show height, width, and depth. By moving from side to side, a viewer can see the front and the sides of an object shown in a hologram. The process of making holograms is called holography.

A typical hologram is created with a laser. A special mirror splits light from a laser into two beams. One beam shines



Holography uses no camera. Instead, two beams of light from a single laser shine on a piece of film. One of the beams reflects from the object.

directly onto a piece of photographic film. The other shines on the object and reflects onto the film. The two overlapping beams create a pattern of closely spaced lines. The pattern recorded on the film is the hologram.

Some types of hologram have to be viewed with light from a laser. Other holograms can be viewed with ordinary light.

Holograms have many uses. People can make holograms of things that are hard to see normally—for example, parts inside the human body. Then they can

study the details recorded in the hologram. Small holograms are commonly found on credit cards, driver's licenses, and paper money. The holograms make it difficult to produce illegal copies.

► More to explore

Laser • Photography

Holy Roman Empire

For many centuries, beginning in AD 800, the Holy Roman Empire ruled



Rudolf I was Holy Roman emperor from 1273 to 1291.

over much of Europe. The lands of the empire originally included what are now Germany, Austria, the Czech Republic, Switzerland, The Netherlands, Belgium, Luxembourg, eastern France, and parts of northern and central Italy.

In its later centuries the Holy Roman Empire lost most of its power. Nevertheless, it lasted for more than 1,000 years, until 1806.

Beginnings

The western part of the Roman Empire came to an end in AD 476. The Roman Empire continued in the east as the Byzantine Empire. It was ruled from Constantinople, in what is now Turkey.

In the place of the western empire rose many tribal kingdoms. One of the tribes was the Franks. The modern country of France is named after the Franks. A Frankish ruler named Charlemagne conquered surrounding lands and became very powerful. In 800 Pope Leo III, the head of the Roman Catholic church, crowned Charlemagne emperor of the new Roman Empire.

The pope wanted a strong new empire with close ties to the church. However, soon after Charlemagne's death the empire broke apart. The western part became known as France. The eastern part became known as Germany. It continued the empire.

The title of emperor did not pass automatically from father to son. Local German rulers elected a German king. If the



An illustration shows the crowning of Emperor Louis I (right). Louis was the son of Charlemagne. Many rebellions broke out during Louis's reign.

pope agreed with the choice, he crowned the king emperor.

Saxon Emperors

By the middle of the 900s, a German people called the Saxons ruled the empire. The Saxon emperor Otto III, who reigned between 983 and 1002, made Rome his capital. For a long time afterward, popes and emperors quarreled over who had the right to choose religious leaders.

Hohenstaufen Emperors

Emperors of the Hohenstaufen family gained power in 1138. The Hohenstaufen emperor Frederick I Barbarossa added the word holy to the name of the empire. This was because he wanted to have as much respect as the pope had. Frederick died in 1190. Not long after that, the empire lost some of its earlier importance.

Hapsburg Emperors

In 1273 the Hapsburg family gained control of Germany. They soon centered their power in Austria. Hapsburg kings often took the title of emperor without being crowned by the pope. The Hapsburgs ruled the Holy Roman Empire almost continuously from 1452 onward.

End of the Empire

In the 1500s some people broke away from the Roman Catholic church and formed Protestant churches. This weakened the empire. German leaders who became Protestant opposed the Roman Catholic emperors.

After about 1650 the empire was only a loose grouping of German states. In 1806 Emperor Francis II finally ended the Holy Roman Empire. Francis continued to rule, however, as emperor of Austria.

► More to explore

Charlemagne • Germany • Hapsburgs
• Roman Catholicism

Holy See

► see Vatican City.

Homeopathy

Homeopathy is a form of medical care. It is based on the idea that “like cures like.” This means that a drug that creates symptoms, or signs, of illness in a



Homeopathy is popular in many parts of the world. A store in Hong Kong has shelves full of homeopathic medicines.

Did You Know?

Homeopathic remedies are believed to help the body heal itself.

healthy person can be used to treat the same symptoms in a sick person.

Homeopathy started with German physician Samuel Hahnemann in 1796. Hahnemann did an experiment on himself. He took large doses of a drug to treat the disease malaria. He went from healthy to having symptoms of malaria. This gave him the idea of “like cures like.”

Hahnemann also thought that large doses of medicine made an illness worse. He believed that small doses were more effective. This idea is also a part of homeopathy.

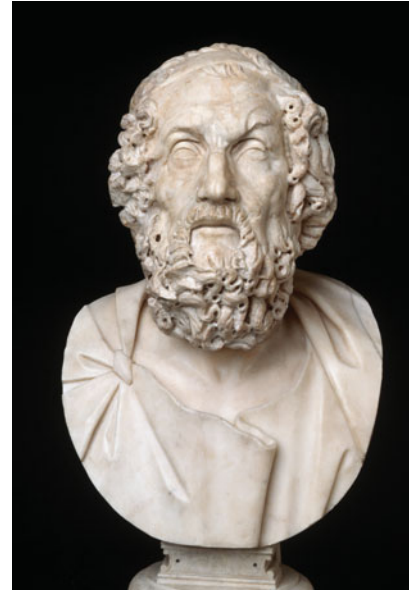
Before homeopathy, doctors sometimes treated patients with methods that were harsh and even dangerous. For example, they might draw a lot of blood from a person’s body while trying to cure a disease. Homeopathy became popular because it was a milder form of treatment. But today many doctors dislike homeopathy. They prefer to look for the cause of an illness instead of focusing on the symptoms.

► More to explore

Drug • Medicine

Homer

Homer was a poet in ancient Greece. Many people believe that he created the classic stories of the *Iliad* and the *Odyssey*. These long poems tell of historic events and heroic deeds during and after the Trojan War in ancient Greece. They have been translated into many lan-



Many artists made sculptures of Homer long after his death. However, no one knows for certain what he looked like.

guages. People all over the world still read them today.

Very little is known about Homer. Scholars think that he lived in the 800s or 700s BC in the region called Ionia (now in Turkey).

Homer was a poet in the oral tradition. This means that he traveled from place to place and recited poems aloud. The stories of the *Iliad* and the *Odyssey* were probably not written down until centuries after they were first recited.

Many scholars today also believe that the stories were written by more than one person. However, Homer is traditionally given credit for these works.

► More to explore

Greece, Ancient • Mythology • Poetry

Honduras

In 1502 Christopher Columbus became the first European to see what is now the Central American country of Honduras. Columbus named the land Honduras, meaning “depths,” because of the deep waters off its coast. The capital of Honduras is Tegucigalpa.

Geography

Honduras has a long northern coast on the Caribbean Sea and a short southern coast on the Pacific Ocean. It borders Guatemala, El Salvador, and Nicaragua. Most of the land is mountainous. In the northeast is a swampy area called the Mosquito Coast. Honduras’ weather is warm year-round.

Plants and Animals

Evergreen forests of mahogany, balsa, and Spanish cedar trees grow in the lower mountains. Pines and oaks grow on the higher slopes. Mangrove and palm trees grow near the coast. Honduras’ wildlife includes crocodiles, snakes,

peccaries (piglike mammals), pumas, and toucans.

People

Nearly 90 percent of Hondurans are mestizos, or people with mixed Spanish and American Indian roots. There are smaller groups of Indians, blacks, and whites. The main language is Spanish. Roman Catholicism is the main religion. Most people in Honduras live in the west.

Economy

The economy of Honduras is based on manufacturing and farming. Factories make mainly food products and clothing. Major crops include bananas and coffee. Tourism is a growing industry.

History

American Indians, including the Maya, lived in what is now Honduras when Spanish colonists arrived in the early 1500s. Honduras gained independence from Spain in 1821. It was part of a political union called the United Provinces of Central America until 1838, when it became fully independent.

The Honduran military played a strong role in the country during the 1900s. In 1982 an elected, nonmilitary government came to power. Since then leaders have struggled to improve Honduras’ economy.

► More to explore

Central America • Tegucigalpa



Facts About HONDURAS



Population
(2008 estimate)
7,639,000

Area
43,433 sq mi
(112,492 sq km)

Capital
Tegucigalpa

Form of government
Republic

Major cities
Tegucigalpa, San Pedro Sula, La Ceiba, El Progreso, Choluteca

Hong Kong



Hong Kong is a region on the southeastern coast of China. It juts out into the South China Sea. Hong Kong's deep harbor makes it valuable for shipping.

Hong Kong covers an area of 425 square miles (1,102 square kilometers). It is made up of the main island called Hong Kong, Lantau Island, the Kowloon Peninsula, and some 200 small islands. Hong Kong also includes a region called the New Territories, to the north of Kowloon Peninsula. Victoria, on Hong Kong Island, is the center of business and government.



Hong Kong is home to many businesses and banks. It is one of the world's major trade and financial centers.

Hong Kong has a mixed culture. The people celebrate holidays of both the East and the West, such as the Lunar (Chinese) New Year and Christmas. Many people speak English as well as Chinese.

Hong Kong's economy is based on banking, investment, and international trade. Tourism and fishing are also important to the economy. In addition, Hong Kong is a major producer of motion pictures.

People have been living in the region of Hong Kong for more than 3,000 years. In 1821 British merchants began to use Hong Kong's harbor. Great Britain and China fought several wars in the mid-1800s. Britain won those wars, and it received control over Hong Kong for 99 years.

In 1984 Britain agreed to return Hong Kong to China. The Chinese agreed to make Hong Kong a special administrative region of China. This means that Hong Kong does not follow all the policies, or rules, that the rest of China does. Control of Hong Kong went back to China in 1997.

► More to explore

China

Honiara

Honiara is the capital of the Solomon Islands, a country in the Pacific Ocean. The town is located on the coast of Guadalcanal, the country's largest



Dancers in Honiara wear traditional clothing during an outdoor ceremony.

island. It sits at the mouth of the Mataniko River.

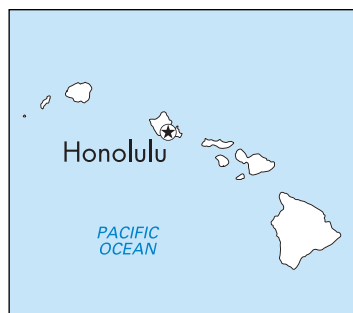
Businesses in Honiara prepare and ship the country's goods for sale around the world. These goods include timber, fish, palm oil, and coconut products. The town's tourism industry began to grow in the late 20th century.

Before World War II (1939–45) Honiara did not exist. It developed around the U.S. military headquarters on Guadalcanal. Some of the fiercest fighting between U.S. and Japanese forces during the war took place on the island.

Honiara became the capital of the Solomon Islands in 1952. In the late 20th and early 21st centuries Honiara suffered from crime and riots.

► **More to explore**
Solomon Islands

Honolulu



Population
(2000 census),
city, 371,657;
(2007 estimate)
375,571

Honolulu is the capital of the U.S. state of Hawaii. The city is located on the coast of Oahu Island.

Honolulu is Hawaii's main port. It is also the state's center of business and industry. Factories in the city make food products, clothing, cement, and many other goods.

Tourism is also important to Honolulu's economy. Many people go to the city to enjoy its beaches and pleasant climate.

Polynesians from other Pacific islands settled in Honolulu hundreds of years ago. In the 1800s Honolulu became wealthy as a supply port for the whaling industry. The city became the capital of



Waikiki is a popular tourist area in Honolulu. It is especially known for its beach.

the kingdom of Hawaii in 1850. In the 1890s Hawaii became a territory of the United States. Honolulu remained the capital of Hawaii.

In 1941 Japanese forces bombed a U.S. naval base at Pearl Harbor, just outside Honolulu. The United States then entered World War II. The U.S. military built many bases on Oahu. When Hawaii became a state in 1959 Honolulu remained the capital.

► More to explore

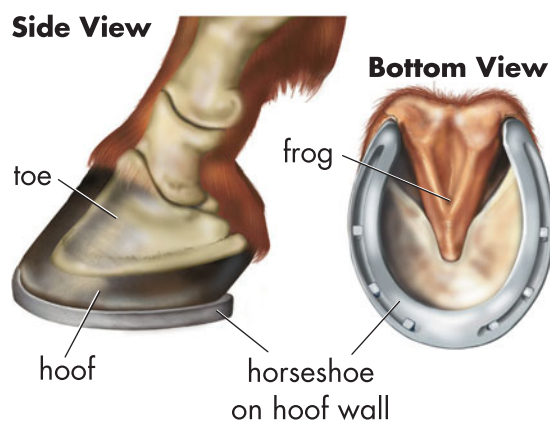
Hawaii

Hoof

Hooves are hard coverings that protect the toes of many animals. Hooves are not feet. They are more like toenails. Hooves allow animals to walk for long distances on hard surfaces without damaging their toes.

Horses, cattle, deer, pigs, sheep, camels, and other animals have hooves. Some

Hoof of a Horse



Horses have one hoof at the end of each leg. Horseshoes are nailed onto the hoof wall to protect the hoof.

animals, including horses and zebras, have a single hoof at the bottom of each foot. Other animals, including cattle and rhinoceroses, have separate hooves covering each toe.

Structure

Hooves are made of a protein called keratin. Keratin also makes up hair, fingernails, horns, and feathers. Even though hooves are hard and tough, they wear down with use. But like hair, hooves continue to grow throughout an animal's life.

Hooves are not one solid piece. They grow in layers. Dead cells make up the hard, outer shell of the hoof. This part of the hoof, called the hoof wall, supports the animal's weight. It also protects the softer parts of the toe.

Inside the wall of the hoof is a spongy growth called the frog. The frog acts as a cushion. Without the frog, an animal's leg bones could be damaged by walking on hard surfaces. The frog also pumps blood through the hoof as the animal walks.

The only part of the hoof that grows is the area where it attaches to the toe. If the hoof cracks or is damaged, it cannot grow back together in the same way that a cut heals. It must grow from the inside out.

Hoof Protection

Working animals, especially horses, benefit from having metal shoes attached to the bottom of their hooves. These horseshoes protect the hooves from cracks

and too much wear. People nail the shoes onto the hoof wall. This does not hurt the horse because the hoof wall is dead tissue.

► More to explore

Hair • Horn • Horse • Nail and Claw

Hoover, Herbert

In 1929 Herbert Hoover became the 31st president of the United States. Soon after his election the country sank into the Great Depression. Hoover had helped starving people in Europe during World War I. However, he could not help the millions of U.S. citizens who lost their jobs during the depression.

Early Life

Herbert Hoover was born on August 10, 1874, in West Branch, Iowa. Herbert's



Herbert Hoover was the 31st president of the United States.

father, Jesse Clark Hoover, was a blacksmith. He died when Herbert was 6 years old. Herbert's mother, Hulda Minthorn Hoover, died three years later. After his parents died, Herbert moved to Newberg, Oregon, to live with his uncle and aunt.

Career

Hoover graduated from Stanford University in 1895 with a degree in geology. He became a mining engineer and worked in many countries, including China. In 1899 Hoover married Lou Henry. The couple had two sons. Hoover eventually started his own engineering firm with offices around the world.

During and after World War I (1914–18), Hoover headed organizations that sent food to soldiers and hungry people in Europe. From 1921 to 1928 Hoover served as secretary of commerce under presidents Warren G. Harding and Calvin Coolidge. He supported efforts by workers to improve their conditions. He also supported major engineering projects, including the construction of the Hoover Dam.

Presidency

The Republican Party chose Hoover to run for president in 1928. He easily defeated the Democratic candidate, Alfred E. Smith. When Hoover took office, the economy was strong. In October 1929, however, the stock market crashed, and the worst depression in U.S. history began.

Did You Know?

Hoover worked to relieve hunger in Europe, Asia, and South America in the 1940s.



TIMELINE

Hoover is born in West Branch, Iowa.

August 10, 1874

Hoover is elected president.

1928

Hoover loses the presidential election to Franklin D. Roosevelt.

1932

Hoover dies in New York City.

October 20, 1964

Hoover becomes secretary of commerce.

1921

The stock market crashes and the Great Depression begins.

October 29, 1929

Hoover heads a group that reorganizes U.S. government departments.

1947–49

Hoover quickly asked companies not to fire workers or cut wages. But many people had already lost their jobs. Hoover encouraged state and local governments to join private charities in caring for the new poor. He also approved a program that lent government money to states, banks, and companies. Hoover refused to give money directly to citizens, though. As the Great Depression worsened, the public began to blame the president.

Retirement

Hoover ran for reelection in 1932, but the Democratic candidate, Franklin D. Roosevelt, won. Hoover disagreed with the way Roosevelt handled the depression. He later helped reorganize several government agencies. Hoover died in New York City on October 20, 1964.

► More to explore

Great Depression • Roosevelt, Franklin D. • United States

Hopewell Culture

The prehistoric Native Americans of the Hopewell culture lived in east-central North America between about 200 BC and AD 500. They lived mainly in what is now southern Ohio.

The Hopewell Indians are best known for the earth mounds they built. Like the Indians of the Adena culture who came before them, they built large mounds in which they buried the bodies of important people. They also created earthworks in geometric shapes such as circles, rectangles, and octagons.

The Hopewell Indians lived in villages along rivers and streams. They built dome-shaped houses covered with bark, animal hides, or woven mats. They got their food by hunting, fishing, and gathering wild nuts, fruits, seeds, and roots.



Hopewell Indians shaped objects out of copper.

They also grew crops such as corn and possibly beans and squash.

By about AD 400 the Hopewell culture began to decline. No one knows for sure what happened to it. Some scientists think that a long drought or change in climate brought about a food shortage. Others believe that the Hopewell Indians began to fight each other over farmland or that they were overwhelmed by more warlike tribes.

► More to explore

Adena Culture • Mound Builder
• Native Americans

Hopi

The Hopi are one of the Native American groups known as Pueblo Indians. Many Hopi live on a reservation in northeastern Arizona, in the United States. This land is part of their traditional homeland. Like the other Pueblo Indians, the Hopi are descendants of the Anasazi people. The Anasazi are also known as the Cliff Dwellers.

The Hopi traditionally lived in homes made of stone and adobe, or sun-baked clay. Their houses had flat roofs and were sometimes several stories high. They were often joined together in groups similar to modern apartment buildings.

The Hopi grew corn, beans, squash, melons, and other fruits and vegetables. They also raised sheep. Hopi women made baskets and fine pottery.

Spanish explorers arrived in Hopi lands in 1540. In 1680 the Hopi joined other Pueblo Indians in a revolt against the Spanish. They drove the Spanish from their lands for 12 years. The Spanish reconquered the area in 1692. Later the land was ruled by Mexico.

The United States took control of the land in 1848. In 1882 the U.S. government set up a reservation for the Hopi. The Hopi reservation is surrounded by



Hopi dancers perform at a celebration in Washington, D.C.

the much larger reservation of the Navajo. This has led to disagreements between the Hopi and the Navajo over land. At the end of the 20th century there were more than 10,000 Hopi living in the United States.

► More to explore

Anasazi • Native Americans • Navajo
• Pueblo Indians

Hormone

Just about every living thing made up of more than one cell produces hormones. Hormones are chemicals that tell cells and body parts to do certain things. For example, hormones tell the body when to grow and when to stop growing.

In humans and other animals, organs called glands release hormones into the blood. Together these glands make up the endocrine system. Other organs, such as the stomach and the small intestine, also release hormones.



One type of hormone controls how much a person grows. A man who had too much growth hormone grew to be more than 8 feet (2.4 meters) tall.

Types of Hormones

Plants produce hormones that control their growth. Plant hormones also cause flowers and fruit to grow.

Insects make hormones, too. One hormone causes insects to molt, or shed their exoskeletons. Others cause metamorphosis (the change from baby to adult).

Insects and many other animals release hormones called pheromones into their habitats. These pheromones can attract mates, mark the location of food, or warn other animals of danger.

The human body makes more than 20 major hormones. Growth hormone helps to build muscles. Adrenaline, also called epinephrine, makes the heart beat fast during stressful times. Insulin controls the level of sugar in the blood. Estrogen causes girls to grow into women. Testosterone causes boys to grow into men.

How Hormones Work

In humans, hormones travel through the blood to cells throughout the body. Many different hormones may be in the blood at one time. Each hormone can affect only a certain type of cell. These cells are known as target cells. A hormone travels to its own target cells and locks onto them. When this happens, the hormone causes the cells to start or to stop certain activities.

► More to explore

Blood • Cell • Endocrine System

Horn

Many animals have hard structures, called horns, growing from their heads. Most horned animals also have hooves. Sheep, cattle, goats, and antelope are some of the most common horned animals.

Structure

Horns are hollow and pointed. They are attached to the bone of an animal's head. Horns are made of keratin, a type of protein. Keratin is the same material that makes up hooves, hair, fingernails, and feathers. Animals may be born with those things, but animals are not born with horns. The horns grow as the animals get older.

Horns grow in pairs, one on each side of the head. Horns vary greatly in size and shape. Bighorn sheep have large, curled horns. Antelope have long, thin horns that point upward. Oxen have long, heavy horns that stick out from the sides of their heads.

Uses

Animals use horns as weapons to protect themselves from enemies. They also use their horns in battles with other animals

of their kind. In some types of animals, only the male has horns. In others, both males and females have horns. A large set of horns may impress mates. They show that the animal has lived a long time and can defend itself.

False Horns

Hornlike antlers grow from the heads of deer, elk, and moose. Antlers are not true horns, however. They are bone with a velvety covering. Antlers fall off every year. Horns never fall off.

Many lizards have bony stalks that look like horns. Giraffes have knobby growths made of bone covered with skin and hair. The single horn of a rhinoceros is actually made of hardened hairs that are tightly bunched together.

► More to explore

Hair • Hoof • Nail and Claw

Horse

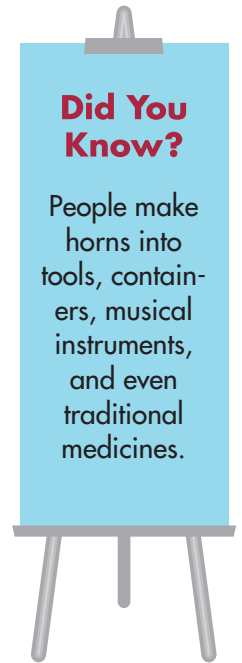
The horse is a mammal that people have valued for thousands of years. In the past people commonly used horses to get from place to place and to pull heavy loads. People still use horses in sports and recreation. The scientific name of the horse is *Equus caballus*.

Where Horses Live

Horses once roamed free over grasslands in North America, South America, Europe, Asia, and Africa. Today, however, almost all horses are domesticated, or tamed. Domesticated horses are kept by people all over the world.

Did You Know?

People make horns into tools, containers, musical instruments, and even traditional medicines.



Animal horns grow in many different shapes.



Przewalski's horse has a short mane that stands upright.

The only surviving type of horse that has never been tamed is called Przewalski's horse. It now lives mostly in zoos. Other horses that roam free came from horses that were raised by people. These horses include the mustangs of western North America.

Physical Features and Breeds

Horses are large and very strong. A typical domesticated horse stands 5 feet (1.5 meters) tall at the shoulder. It weighs about 1,150 pounds (520 kilograms).

A horse's legs are strong even though they look very slender. A horse's foot is actually a single toe protected by a hard covering called a hoof. The hoof is made of the same material as a human toenail or fingernail.

Over the centuries people have bred horses to have features that they considered useful or desirable. The breeds can be grouped into three general types: light horses, heavy horses, and ponies. Light horses are used mostly for riding.

They include the Thoroughbred, a breed that is used for racing. Heavy horses, also called draft horses, can pull heavy wagons. Some heavy horses weigh more than 2,000 pounds (900 kilograms). The smallest breeds are called ponies. Some ponies weigh only 385 pounds (175 kilograms) or less.

Behavior

Horses eat grass. Most free-living horses graze and wander in groups called bands. One type of band is called a breeding band. A breeding band usually has one adult male, several adult females, and their young. A bachelor band consists of males only.

Horses have several gaits, or ways of stepping. The fastest gait is called a gallop. A slower gallop is called a canter. The trot is slower than the canter. The walk is slowest of all.

Life Cycle

About 11 months after mating, a female horse usually gives birth to a single



A pony ride is a treat for a child.

young, or foal. Within a few hours after birth, a healthy foal is on its feet. Horses usually live between 20 and 35 years, but some have survived past age 40.

Horses and Humans

People hunted horses until they learned to tame them. Scientists believe that people first tamed horses in central Asia, probably long before 2000 BC.

Warhorses

Ancient people used horses in wars. By about 1,600 BC people in southwestern Asia were fighting on horseback. They also fought in chariots, which were wheeled vehicles pulled by horses. About 800 years later Asians brought horses to Europe. The army of ancient Rome included troops on horseback.

During the Middle Ages (AD 500 to 1500) warriors called knights rode heavy horses. When warriors stopped wearing armor, they switched to lighter and faster horses.

Workhorses

At first horses could not pull heavy loads without hurting themselves. Then, in the 1100s, people started using padded horse collars. A horse with a collar could pull a plow. Horses also pulled railroad cars and other vehicles. Horses were a major source of power until the 1900s, when machines took over the work.

Horses in Sports

Horse racing is an ancient sport. As early as 700 BC the Olympic Games of ancient Greece featured horse races.



The Kentucky Derby is the most important Thoroughbred horse race in the United States.

Today horses race on oval tracks or straight courses. Some courses have obstacles that the horse must jump over. In harness racing the horse pulls a two-wheeled vehicle with a driver.

Horses and riders also compete in jumping or riding sports known as equestrian events. The Olympic Games feature equestrian events. Other sports that use horses include polo and rodeo.

► More to explore

Hoof • Knight • Mammal • Sports
• War

Hospital

A hospital is a place where people go for medical attention and treatment. Someone needing help for a serious illness or injury may go to a hospital. Women also go to hospitals to have babies. People may stay in a hospital for a few hours or for many days.



A girl greets her newborn sister in the nursery of a hospital.

Types of Hospitals

General hospitals handle most medical problems. Special hospitals focus on certain diseases, such as cancer. Others care for specific groups, such as older people or people with mental illnesses. Medical schools run teaching hospitals to train doctors.

Religious and educational groups own many hospitals in the United States and Canada. They do not keep any money made by the hospital. Some U.S. hospitals are owned by companies that do try to make money. Governments own and run most hospitals in the rest of the world.

Hospital Divisions

Most hospitals are divided into areas with different purposes. The emergency room handles sudden illnesses and injuries. Patients with breathing problems or bad burns go to the intensive care unit. For surgery, patients go to an operating room. Women having babies go to the labor and delivery department. The

laboratory does medical tests. The pharmacy prepares medicines.

Doctors guide the care of hospital patients. Nurses follow doctors' instructions and make patients comfortable.

History

In the 400s BC Hindus in what is now Sri Lanka created the first known hospitals. The ancient Romans also treated patients in hospitals. Christians later created many hospitals in Europe. The first medical hospital in the United States was founded in 1751. It treated mainly poor people.

As medicine got better, more middle-class and wealthy people went to hospitals. Today most people in developed countries are born in a hospital, and many die in one.

► More to explore

Disease, Human • Medicine • Nursing
• Surgery

Houston



Population
(2000 census),
city, 1,953,631;
(2007 estimate)
2,208,180

Houston is the largest city in the U.S. state of Texas. It is also the fourth largest city in the United States. The city owes

much of its growth to its large oil and natural gas industries.

The Lyndon B. Johnson Space Center in Houston is home base for U.S. astronauts. The center controls space flights and does research for the National Aeronautics and Space Administration (NASA).

Several large oil and energy companies have headquarters in the Houston area. Many factories in the city process oil into gasoline, diesel fuel, and chemicals. Houston is the second busiest port in the United States. Ships reach the city from the Gulf of Mexico through a waterway called the Houston Ship Channel.

Health care also fuels the Houston economy. The Texas Medical Center is one of the largest medical centers in the United States.

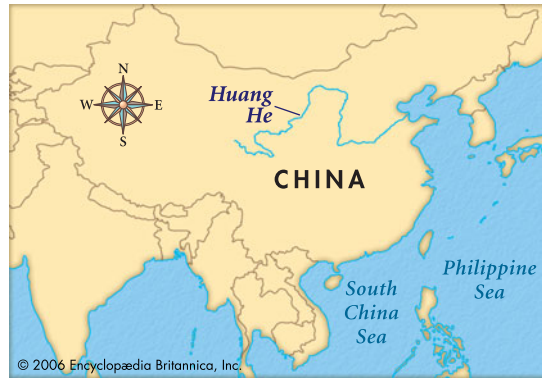
Houston was founded in 1836, the year that Texas won its independence from Mexico. It was named for Sam Houston, a hero of Texas' war for independence.

► More to explore

Texas

Huang He

The Huang He is the second longest river in China. (The Yangtze River is the longest.) The name Huang He means "Yellow River" in Chinese. The river got its name from the color of its muddy waters. A great Chinese civilization



developed along its banks by about the 1700s BC.

The Huang He is 3,395 miles (5,464 kilometers) long. It begins in mountains that rise from the Plateau of Tibet in western China. There the river drops rapidly through deep mountain gorges.

The middle course of the river is a great loop. Much of it runs through the Loess Plateau. This region is named for its crumbly soil, called loess. Large amounts of soil wash into the river.

The lower course stretches east across the North China Plain. The river empties into the Yellow Sea, which is a part of the Pacific Ocean.

Floodwaters from the Huang He deposit silt (soil particles) on the North China Plain. Crops grow well in silty soil. People have grown crops on the North China Plain for thousands of years.

Since before 500 BC, people have built earth barriers called levees to protect villages near the Huang He from floods. A break in a levee can cause a major disaster. The river now has large dams that control floods, provide electric

power, and hold back water for use in farming.

► **More to explore**

China • River • Soil • Yangtze River

Hudson Bay



Hudson Bay is a large sea in northeastern Canada. It is named for Henry Hudson, an English explorer. Hudson discovered the bay in 1610 while looking for a way to sail west from Europe to Asia.

The weather at Hudson Bay is harsh. Snowstorms and strong winds are common in winter. Floating sheets of ice cover much of the bay during the coldest months.

Most of the coast of Hudson Bay is lined with marshes. The marshes sit on top of permafrost, or permanently frozen soil. Mosses, lichens, and small trees and bushes grow along the shore. Some pine forests grow near the shore in the south.

Hudson Bay was once very important to the economy of Canada. The Hudson's Bay Company built and operated fur-trading posts along the shore. Today the Canadian government does not allow much economic activity on the bay. It wants to protect the area. Native people who live in small villages around the bay are allowed to fish and hunt sea mammals.

► **More to explore**

Canada • Hudson's Bay Company
• Marsh

Hudson's Bay Company

The Hudson's Bay Company is the oldest company in Canada. It was started in 1670 as a fur-trading company. Today the company runs department stores throughout Canada.

In the 1600s both rich Europeans and poor settlers in North America wore clothing and hats made of fur. Explorers



The Hudson's Bay Company had many small buildings called stations in the Canadian Arctic region.

in North America searched for animals that could provide this fur.

Two French traders found many beavers as they traveled along the coast of Hudson Bay, in Canada. With the help of the king of England, they formed a company to trade beaver pelts, or skins, for other goods.

The Hudson's Bay Company built trading posts along the coasts of Hudson Bay, James Bay, and the Arctic Ocean. The company traded with Native Americans, who brought pelts from beavers, foxes, bears, and wolves. In exchange for the pelts, the company gave the Indians such goods as weapons, gunpowder, beads, fishhooks, axes, sewing needles, scissors, cooking pots, and wool blankets.

In the late 1800s the demand for beaver pelts began to fall. The Hudson's Bay Company had to find new goods for trade. By the early 1900s the Hudson's Bay Company had turned its trading posts into shops. It also built department stores in Canadian cities. By the late 20th century the company no longer traded in furs.

► More to explore

Canada • Fur Trade

Hughes, Langston

The writer Langston Hughes was an important figure of the Harlem Renaissance. This was a period of great creativ-



Langston Hughes

ity among African American artists. Hughes wrote about the joys and sorrows of ordinary blacks. He is known especially for his poetry.

James Mercer Langston Hughes was born on February 1, 1902, in Joplin, Missouri. He lived in many different places as a child. He started writing poetry while in high school in Cleveland, Ohio.

In 1921 Hughes entered Columbia University in New York City. He was so unhappy that he left school after a year. Then he took time to explore Harlem, a mostly black New York City neighborhood. There he met other people interested in writing about the experiences of African Americans.

Hughes's career as a writer took off in 1925. He was working as a busboy at a hotel in Washington, D.C. He showed his poems to U.S. poet Vachel Lindsay while Lindsay dined at the hotel. Lind-

say helped call the country's attention to Hughes's work. Hughes then received a scholarship to attend Lincoln University in Oxford, Pennsylvania. He graduated in 1929.

Hughes published his first book of poetry, *The Weary Blues*, in 1926. His most famous work may be *Montage of a Dream Deferred* (1951). This book-length poem describes the challenges faced by African Americans living in cities.

In addition to poetry, Hughes also wrote novels, plays, essays, short stories, and children's books. He died in New York City on May 22, 1967.

► More to explore

African Americans • Poetry

Huguenots

Beginning in the early 1500s, many Christians left the Roman Catholic church and started new churches. They were known as Protestants. The Protes-



After the Huguenots lost their rights in 1685, they had to meet in secret.

tants of France were called Huguenots. Many Huguenots suffered cruel treatment because of their religion.

The Huguenots were also known as French Calvinists. This was because they followed the teachings of the Protestant leader John Calvin. Many Huguenots were poor people, but others were wealthy nobles. A few became powerful leaders of the Protestant movement in France.

A period of wars between Huguenots and Catholics began in about 1560. On the night of August 24, 1572, Roman Catholics killed almost all the Huguenot leaders in Paris. This was called the Massacre of Saint Bartholomew's Day. Catholics killed thousands of Protestants all over France during this time.

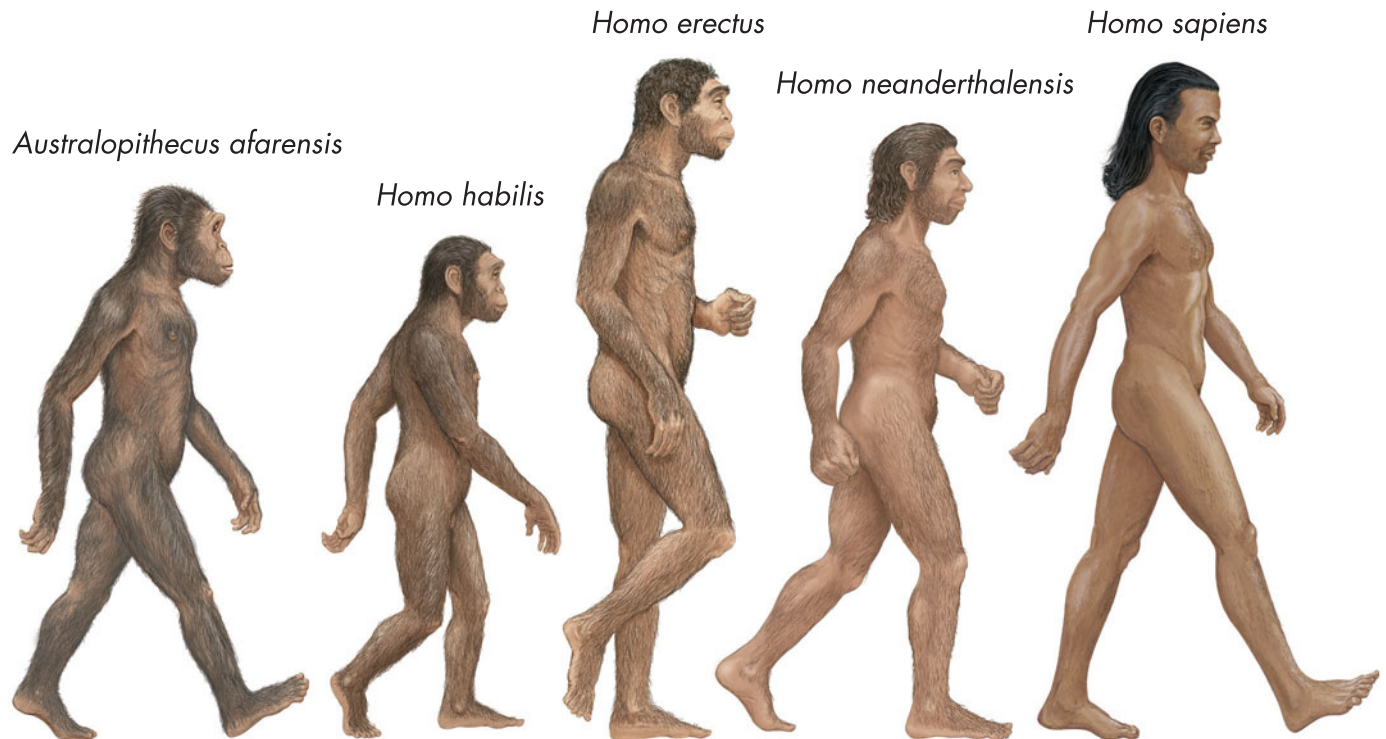
In April 1598 King Henry IV gave the Huguenots some rights. In 1685, however, King Louis XIV took away the Huguenots' rights. More than 400,000 Huguenots then left France. Some went to England. Others went to the Netherlands or America. Protestants did not get the same rights as Catholics in France until the beginning of the French Revolution in 1789.

► More to explore

Calvin, John • Protestantism

Human Origins

The study of human origins, or beginnings, involves figuring out how and when human beings began to exist. Sci-



The earliest forms of humans evolved from apelike animals. Modern humans evolved from these early humans.

Scientists have many different theories about human origins. In fact, they form new theories about this all the time. But scientists agree that humans developed over many millions of years from early ancestors that were like apes. The process by which one type of living thing develops into another type is called evolution.

Modern humans evolved in stages from a series of ancestors, including several earlier forms of humans. The bodies of these ancestors changed over many years. In general, their brains became much larger. Their jaws and teeth became smaller. Human ancestors also began walking upright on two feet and using tools. As this happened, the shape of their legs, feet, hands, and other body parts changed.

Fossils

Scientists have a fairly small amount of evidence to use in studying human origins. Most of this evidence comes from fossils, or the remains of living things preserved in the ground. The study of



Neanderthal fossils were found in Israel.

fossils is called paleontology. In Africa, Asia, and Europe scientists have found the bones and tools of human ancestors who lived millions of years ago. And scientists continue to find new clues as to how humans developed.

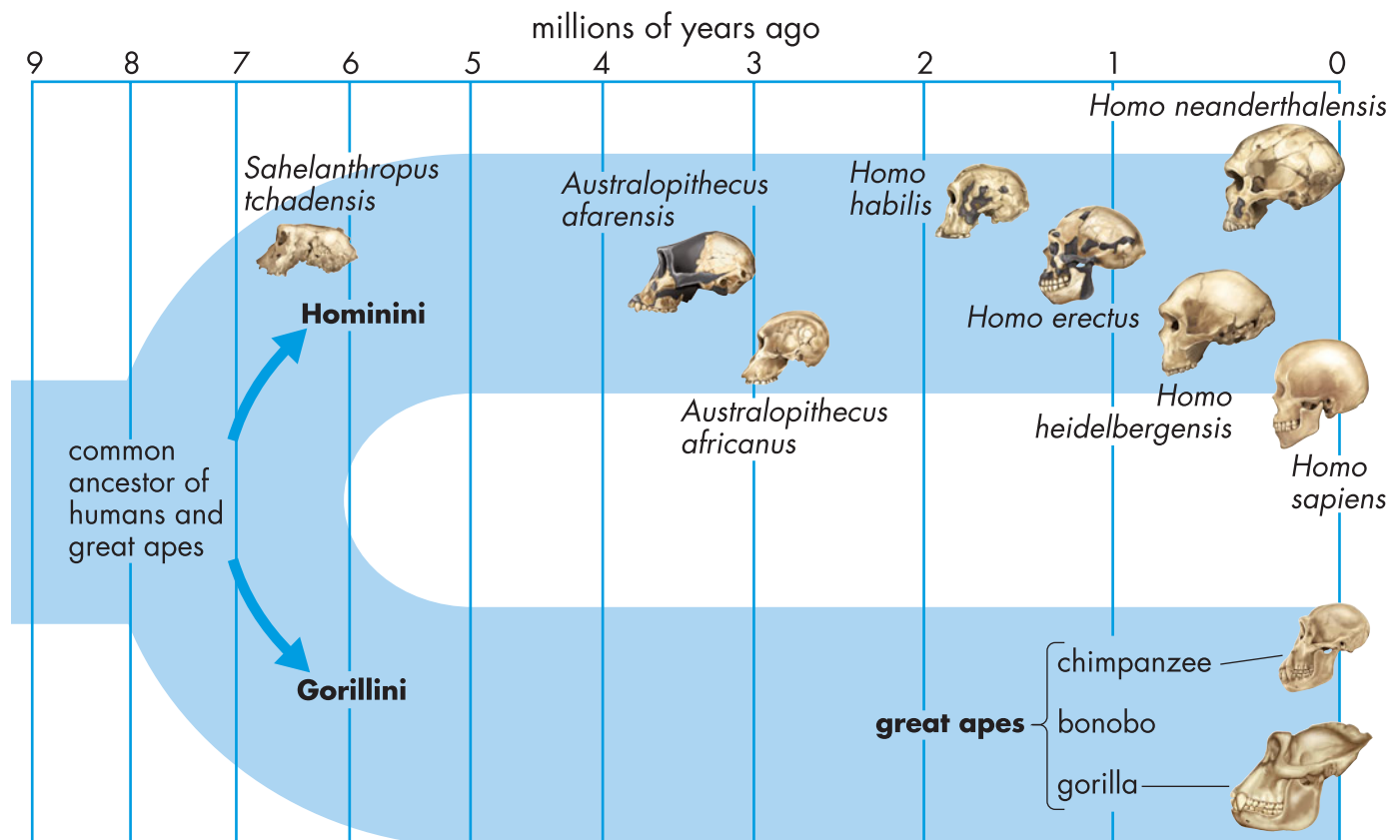
Apes and Humans

Humans did not evolve from apes. Instead, modern humans and apes both developed from the same apelike ancestor. The ancestors of humans became separate from the ancestors of apes between about 8 million and 5 million years ago. After that each group developed on its own.

Modern humans and apes are still closely related. In fact, most scientists

consider humans and great apes—chimpanzees, bonobos, gorillas, and orangutans—to belong to the same scientific family.

But there are a number of important differences between humans and apes. For this reason scientists have divided the family into three smaller groups: the Ponginae, Gorillini, and Hominini. Orangutans belong to the Ponginae group. Gorillas, chimpanzees, and bonobos belong to the group called the Gorillini tribe. Humans belong to the Hominini tribe. The term hominin refers to modern humans and all their ancestors from the time they began developing separately from those of apes.



It took millions of years for modern humans to evolve from an apelike ancestor. Great apes evolved separately from the same apelike ancestor.

Hominins

Today only one species, or type, of hominin exists—modern humans. In the past two or more species of hominin often lived at the same time. Scientists do not always agree about which species are the direct ancestors of other species. But all hominins are closely related.

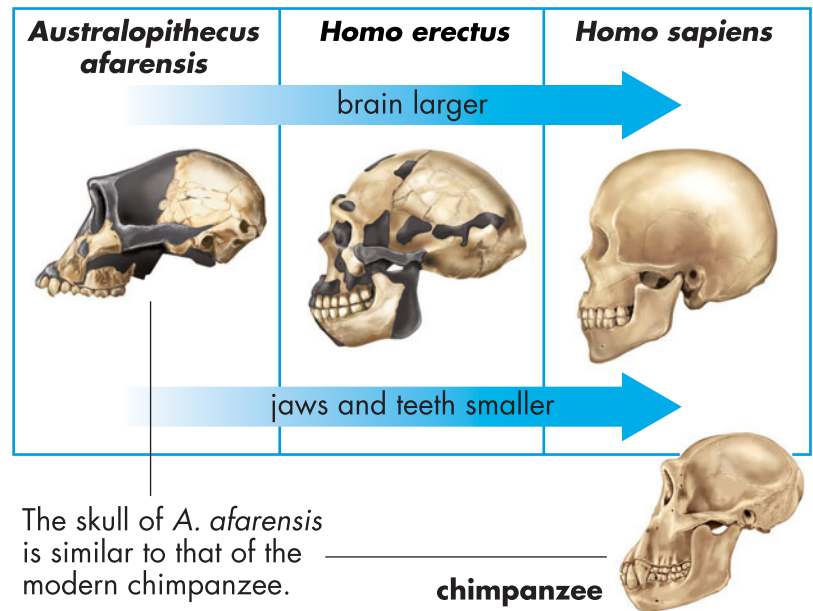
Australopithecines

Some of the earliest hominins are known as australopithecines. There were several different species of this group. Fossils show that they lived in Africa from roughly 4 million to 2.5 million years ago. One of the most famous such fossils is “Lucy”—a partial skeleton found in Ethiopia. These bones are about 3 million years old.

The australopithecines had some apelike features. For instance, their brains were much smaller than modern human brains. They could also climb trees easily. But, like humans, they walked on



Australopithecine individuals left their footprints in Tanzania about 3.5 million years ago.



The brains of human ancestors increased in size over time. The large, complex brains of modern humans make them the most intelligent animals on Earth.

two feet. Scientists know this from studying leg, knee, foot, and pelvis fossils. In addition, they found a set of footprints preserved in the ground in Tanzania.

Humans

Early forms of humans first existed about 2 to 1.5 million years ago. All species of humans belong to a scientific group within the hominin tribe called *Homo*. The scientific names of all human species begin with the word *Homo*, which means “man.” These early humans had larger brains and mostly smaller teeth and jaws than the australopithecines. Their behavior was probably also more like that of modern humans. For instance, an early human species called *Homo habilis* used stone tools to butcher animals. Later human species included *Homo erectus* and *Homo heidel-*

Did You Know?

Many Neanderthal bones were found in caves. This caused some people to think of Neanderthals as "cavemen."

bergensis. Scientists believe that these humans used fire to cook food.

The humans called Neanderthals were alive for part of the same time as modern humans. The Neanderthals died out about 28,000 years ago. They were closely related to modern humans. But most scientists think that these humans were not the direct ancestors of modern humans.

Modern humans probably developed between 200,000 and 100,000 years ago. The scientific name of the species is *Homo sapiens*. Many scientists believe that the first modern humans evolved in Africa and then spread through Asia and Europe and later the Americas. Exactly how modern humans emerged is a question that scientists are still studying.

► More to explore

Ape • Evolution • Fossil • Paleontology

Human Rights

A right that all people are born with is called a human right. Many people now agree that there are a number of human rights. Some of the most basic rights are the right to live and the right to believe what one chooses. Many people also think that a government should protect the human rights of all its people.

Civil Rights and Human Rights

Governments grant civil rights in their constitutions and laws. Human rights



Children in India carry candles to mark International Human Rights Day.

are slightly different. Some people believe that God grants human rights. Other people believe that human rights are a part of nature. The right to get a driver's license is a civil right. The freedom to travel is a human right.

Kinds of Human Rights

People believe in many kinds of human rights. Some kinds of rights put limits on the power of government. Examples of these rights include the right to freedom, the right to equal treatment under the law, and the right not to be tortured.

Other kinds of rights sometimes require governments to provide services. They include the right to a free education, the right to be protected from unemployment, the right to food, and the right to housing.

Still other rights require world cooperation. These include the right to peace and the right to live in a healthy environment.

Human Rights Through the Ages

Early Times

People in many early societies had no rights. They had only duties that they owed to their ruler.

The ancient Greeks and Romans were probably the first people to think much about rights. A Roman group called the Stoics believed in something that they called natural law. They said that natural law gave some rights to everyone, even people who were not citizens of Rome.

The Enlightenment and Afterward

The 1600s and 1700s were a time in European history that is called the Enlightenment. John Locke of England was an Enlightenment thinker who wrote that individual rights are older than governments. Jean-Jacques Rousseau of Switzerland argued that the purpose of governments is to protect those rights. Other thinkers called such rights “the rights of man.”

The American Revolution (1775–83) and the French Revolution of 1789 grew out of these ideas. The U.S. Declaration of Independence lists “Life, Liberty, and the pursuit of Happiness” as rights that “all men” get from God. French people wrote the Declaration of the Rights of Man and of the Citizen.

But even in the United States, many people did not enjoy full human rights. Slaves had almost no rights, and women had limited rights. Most slaves did not gain the basic human right of freedom until the 1800s. Women in most countries did not gain the same rights as men until the 1900s.

Human Rights Since World War II

After World War II (1939–45), the world learned that Nazi Germany had killed millions of Jews and other civilians (people not fighting the war). This crime is called the Holocaust. An international court at Nuremberg, Germany, put Nazi leaders on trial for “crimes against humanity.” The Holocaust convinced many countries that it was necessary to protect the basic rights of people everywhere.

A number of these countries formed an organization called the United Nations (UN) in 1945. In 1948 the UN issued a document called the Universal Declaration of Human Rights. The declaration calls for “human rights” instead of “the rights of man” because it includes women’s rights. The declaration has 30 articles, or sections. They mention many different rights.

Did You Know?

Amnesty International is a group that works to protect human rights. The organization was awarded the Nobel peace prize in 1977.



Lawyers march for human rights in the African country of Zimbabwe.



Former first lady Eleanor Roosevelt holds a copy of the Universal Declaration of Human Rights. Roosevelt helped to create the declaration.

The Office of the United Nations High Commissioner for Human Rights investigates abuses of human rights throughout the world. The office works with several other UN groups to protect the rights of men, women, and children everywhere.

► More to explore

Civil Rights • Holocaust • Slavery
• United Nations • Women's Rights

Hummingbird

A hummingbird is a small bird with a long, slender bill. Many hummingbirds have brightly colored, glittery feathers. Often the males are more colorful than the females. The birds are named for the humming sound made by the rapid beating of their wings.

There are about 320 kinds of hummingbird. They live only in the Americas.

Most of them live in the warmer parts of South America. About 12 kinds are found regularly in the United States and Canada.

All hummingbirds are small, and many are tiny. The largest of these birds is only about 8 inches (20 centimeters) long. It is called the giant hummingbird. The bee hummingbird is slightly longer than 2 inches (5 centimeters). It is the smallest living bird of any kind.

Hummingbirds have long wings and muscular bodies. They can fly forward, sideways, straight up or down, and even backward. Hummingbirds also hover, or hang in one place while beating their wings. Some small hummingbirds beat their wings 80 times per second.

Hummingbirds feed mainly on nectar, a sweet liquid made by flowers. The bird hovers in front of the flower and reaches inside with its long, curved bill. Hummingbirds drink nectar at the rate of about 3 to 13 licks per second.



A green violet-ear hummingbird feeds on nectar from an orchid.

Grains of pollen often stick to hummingbirds while they are feeding. They carry the pollen from flower to flower. This helps the plant to reproduce.

► More to explore

Bird

Hun

The Huns were one of the most feared groups of their time. They were fierce warriors who fought skillfully with bow and arrow on horseback. In the AD 300s and 400s they controlled a huge empire in Europe.

The Huns came from a place in eastern Asia known as Mongolia. They were animal herders who had no settled homes. They moved westward across the grasslands of central Asia with their animals.

The Huns arrived in southeastern Europe in about AD 370. During the next 70 years they conquered peoples there and in central Europe. They

attacked both the eastern and western parts of the Roman Empire.

For many years the Huns did not have a central leader. The first known king to rule the Huns was Rugila, or Rua. He took control sometime before 432. After he died in 434 his nephews Bleda and Attila took over. The two shared power until 445, when Attila killed Bleda.

Attila became one of the world's most famous warriors. He attacked the Byzantine Empire and greatly damaged it. In 451 he invaded Gaul but was defeated. During his reign Attila expanded the Hun Empire.

After Attila died in 453 his many sons divided up the Hun Empire. They began fighting among themselves. Then the people of the empire rebelled. The Huns were defeated in 455. By the end of the century the Huns were no longer a united group.

► More to explore

Rome, Ancient



A painting shows Attila the Hun and his men on horseback.



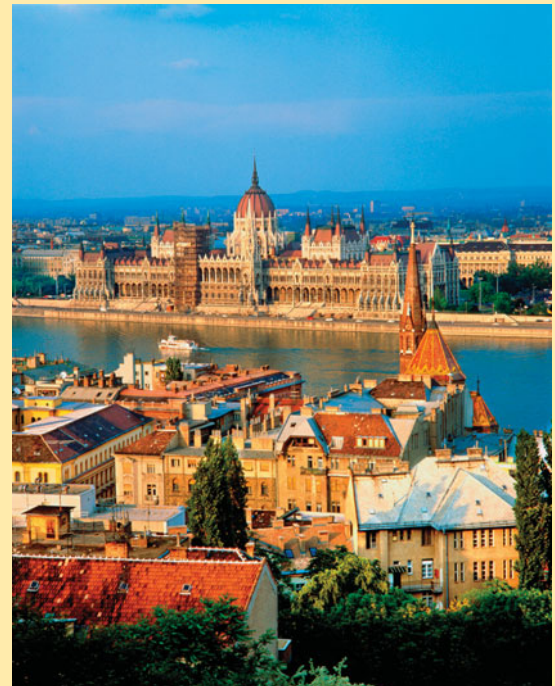
Hungary

Foreign powers controlled the central European country of Hungary for more than 600 years. After moving away from a Communist form of government in 1989, Hungary drew closer to the countries of western Europe. The capital is Budapest.

Geography

Hungary borders Slovakia, Ukraine, Romania, Serbia, Croatia, Slovenia, and Austria. The Danube and the Tisza are Hungary's major rivers. Lake Balaton, in the west, is the largest lake in central Europe.

A low plain, called the Great Alföld, covers the central and eastern parts of Hungary. A smaller plain, the Little Alföld, is in the northwest. The plains are separated by highlands. Transdanubia is a region of hills in the southwest. In the northeast are the Northern Mountains. They contain the country's



The building where Hungary's government makes laws is near the Danube River in Budapest.

highest point, Mount Kékes, at 3,327 feet (1,014 meters).

Hungary has a continental climate, meaning that summers are hot and winters are cold. The Great Alföld contains the driest part of the country. The southwestern highlands are the wettest.

Plants and Animals

Over the years most of Hungary's forests have been cleared for farming. Today forests cover about one fifth of the land. Beech trees grow at the highest elevations. Poplar and oak trees are common, and willows grow along many riverbanks.



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Deer and wild pigs live in the forests at high elevations. Partridges, pheasants, hares, and rodents are common in the lowlands. Bream, pike, perch, and many other kinds of fish are found in the rivers and lakes.

People

Most of the people are ethnic Hungarians. They are descended from the ancient Magyars, who came from an area near the Ural Mountains more than a thousand years ago. There are small groups of Roma (Gypsies), Germans, Slovaks, Jews, and others. Because Hungary is much smaller than it once was, many ethnic Hungarians live in neighboring countries.

Most of the people speak Hungarian, or Magyar, which is the official language. More than half of the people are Roman Catholics. A large number of people are not religious. The majority of Hungarians live in cities or towns.

Economy

Services—including banking, education, and tourism—are the main economic activities. Manufacturing is also important. Products manufactured in Hungary include computers, motor vehicles, food and beverages, machinery, and chemicals. The country's major mineral resource is bauxite, which is used to make aluminum.

Agriculture is a smaller part of the economy. Hungary's leading crops are wheat, corn, sugar beets, grapes, sunflower seeds, potatoes, and apples. Farmers also raise cattle, sheep, pigs, and poultry.

History

The western part of what is now Hungary became a province of the Roman Empire in 14 BC. Germanic and Asian peoples lived in the eastern part. In the AD 400s the Magyars began migrating toward Hungary from the east. Under their leader Árpád, they began to settle along the middle part of the Danube River in the late 800s and early 900s.

The Magyars' most celebrated leader, Stephen, was crowned king in about 1000. He spread Christianity in Hungary. He also organized the kingdom into a strong and independent state. Hungary was the leading power in east-central Europe in the 1100s.

Foreign Control

An invasion by the Mongols in 1241 killed half of Hungary's population. For most of the next six centuries, foreign

Facts About HUNGARY



Population
(2008 estimate)
10,032,000

Area
35,919 sq mi
(93,030 sq km)

Capital
Budapest

Form of government
Republic

Major cities
Budapest, Debrecen, Miskolc, Szeged, Pécs, Győr



The Danube Bend is a popular resort area along the Danube River in northern Hungary. Tourism is an important part of the country's economy.



TIMELINE

Stephen is crowned king of Hungary.		The Austrian Hapsburgs take over Hungary.		Austria-Hungary collapses after World War I.		Hungary holds free elections.
about 1000	1526	1699	1867	1918	1947	1990
	The Ottoman Turks defeat the Hungarian army.		The Hapsburgs form the empire of Austria-Hungary.		Communists take power in Hungary.	

kings or foreign empires ruled Hungary. The Turks made Hungary part of the Ottoman Empire in the 1500s. In the late 1600s the Hapsburg family of Austria took control of the region.

Hungarians started a revolution against Hapsburg rule in 1848, and a year later Hungary declared its independence. With Russian help, the Hapsburgs regained control. The Hapsburgs realized, however, that their empire could not continue without Hungarian support. In 1867 they agreed to establish the double monarchy of Austria-Hungary.

World Wars and Communist Rule

Austria-Hungary was defeated in World War I (1914–18). Afterward, Romania, Czechoslovakia, Yugoslavia, Austria, Poland, and Italy all received parts of Hungary. Hungary was left with only the areas where the Magyars were dominant. In an attempt to regain some of its lost territory, Hungary cooperated with

the Germans against the Soviet Union during World War II (1939–45). Hungary was defeated, however, and Soviet troops took control by April 1945.

In 1947 a Communist government came to power in Hungary. Hungarians rose up against the Communists in 1956, but Soviet troops crushed the revolt. Thousands of people died, and about 200,000 people fled the country. Communist rule later became less harsh, and living conditions in Hungary improved. Soviet control also relaxed in the late 1980s.

Recent Events

Hungary's Communists voluntarily gave up their power in 1989. Hungary held free elections in 1990. The country drew closer to western Europe. It joined the North Atlantic Treaty Organization in 1999 and the European Union in 2004.

► More to explore

Budapest • Europe

Huron

► see Wyandot.

Huron, Lake

Lake Huron is the second largest of the five Great Lakes of North America. It covers an area of 23,000 square miles (59,570 square kilometers). French explorers named the lake after the Huron Indians.

Lake Huron lies along the border between the United States and Canada. The U.S. state of Michigan is to the west. The Canadian province of Ontario is to the north and east.

Water flows into Lake Huron from two main sources. The first is Lake Superior. Its water flows into Lake Huron through the Saint Marys River. The second source is Lake Michigan. The Straits of Mackinac connect Lake Michigan with Lake Huron. At its southern end Lake Huron empties into Lake Erie.



Lumbering and fishing are major economic activities in the Lake Huron region. International shipping is also important. Goods are shipped through the Saint Lawrence Seaway. The seaway links the Great Lakes with the Atlantic Ocean.

Many resorts line Lake Huron's shores. Georgian Bay, in the northeastern part of the lake, is a popular summer resort area. Many tourists visit Georgian Bay Islands National Park and the Thirty Thousand Islands.

► More to explore

Great Lakes • Saint Lawrence River and Seaway • Wyandot

Did You Know?

Lake Huron was the first of the Great Lakes to be visited by Europeans.

Hussein, Saddam

► see Saddam Hussein.

Hydra

A hydra is a tiny animal that lives in water. Hydras can regrow parts of their bodies. They are named after an imaginary creature from Greek mythology, the nine-headed hydra. According to the myth, this monster could grow two new heads for each head that was cut off.

The real-life hydra is only about 1.2 inches (3 centimeters) long. It has a thin, tubelike body with an opening at the top. The opening is used both to eat food and to get rid of waste. Long, fingerlike tentacles grow around this opening. The hydra uses its tentacles to



A new hydra can be seen budding from an existing one. The new hydra is a smaller and paler version of the first one.

sting and paralyze its food. It eats tiny animals.

The hydra can reproduce in two ways. It can release eggs, which are then fertilized in the water. The fertilized eggs grow into new hydras. It can also reproduce by budding. During budding, a hydra grows a new body that finally nips off at its base to make a new hydra.

Hyena

Hyenas are mammals of Africa and Asia. They look something like dogs, but they are not related to them. There are three species, or types, of hyena: spotted, striped, and brown. The spotted hyena is known for its hunting cry, which sounds like human laughter.

Hyenas are gray, brown, or yellowish. Some have stripes or spots. Their front legs are longer than their hind legs. The spotted hyena is the largest species.

Female spotted hyenas are larger than males. Females measure about 6 feet (1.8 meters) long and weigh 175 pounds (80 kilograms).

Hyenas have large heads with jaws and teeth that are strong enough to crush bones. Their excellent senses of hearing and smell help them to find prey.

Hyenas live on dry grasslands with few trees. They find shelter in caves or empty underground tunnels, or burrows. Hyenas are most active at night. They live alone or in packs. Spotted hyenas may form packs of 80 or more animals. Within groups spotted hyenas communicate using signals and sounds.

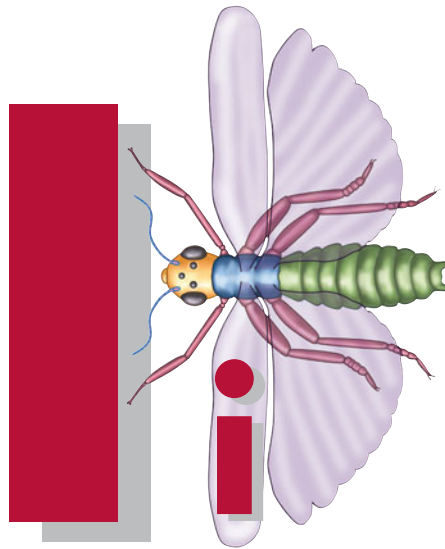
Hyenas are often seen waiting to feed on what is left of a zebra or gazelle after lions are done with it. Sometimes the prey animal was actually killed by the hyenas and then stolen by the lions.

► More to explore

Mammal



Spotted hyenas make many sounds, including yells, giggles, and whoops. These sounds may travel for several miles.



The Iditarod is a dogsled race that takes place in Alaska each year.

(See Iditarod.)

The Inca Empire included about 12 million people at its peak in the early 1500s.

(See Inca.)

There are about 1 million types of insect. They make up about 75 percent of all animals.

(See Insect.)

German engineer Rudolf Diesel developed the diesel engine in about 1890.

(See Internal-Combustion Engine.)

E-mail was invented in 1971.

(See Internet.)

A human's small intestine is about 22 to 25 feet (6.7 to 7.6 meters) long.

(See Intestines.)

Ibis

Ibises are birds with long, slender bills that curve downward. They are wading birds, meaning that they typically walk through shallow water when feeding. They usually feed, fly, and breed in huge groups. The ancient Egyptians believed that one particular type of ibis was holy. After these birds died, the Egyptians carefully preserved them as mummies.

There are about 20 species, or types, of ibis. They belong to a scientific family that also includes spoonbills. As its name suggests, a spoonbill has a beak with a rounded tip that looks like a spoon. Ibises are also related to herons, storks, and flamingos.

Ibises are found in most of the world's warm and hot regions. They tend to live near shallow bodies of water, including marshes, lagoons, lakes, and bays.

Ibises are usually about 22 to 30 inches (55 to 75 centimeters) long. Their legs,



The white ibis lives in North and Central America. Its pink face is bare of feathers.

neck, and bill are long. The tail is short. Most ibises have white, black, or brown feathers. However, the scarlet ibis is bright red. The hadada ibis has greenish feathers, and the glossy ibis has dark brown and shiny purple feathers. In many ibises part of the face lacks feathers but has brightly colored skin.

An ibis uses its long bill to search the mud for food. Ibises eat such animals as shellfish, insects, worms, and small fish.

► More to explore

Bird • Flamingo • Heron • Mummy
• Stork

Icarus

► see Daedalus.

Ice Age

An ice age is a time when thick ice sheets called glaciers cover huge areas of land. An ice age may last for millions of years and can cause big changes to Earth's surface. Ice ages have happened a number of times throughout Earth's history.

The Latest Ice Age

The latest ice age began more than 1.8 million years ago and ended about 10,000 years ago. During this period huge glaciers formed and spread south from the North Pole. Several times these glaciers partly melted so they covered less area. At times glaciers covered all of Canada, much of the United States, and

most of northwestern Europe. The ice was hundreds or even thousands of feet thick.

The lands just south of the glaciers were colder than they are today. The ground near the edges of the glaciers was permanently frozen. Nevertheless, there was a variety of plant and animal life. Few trees could grow, but grasses and some flowering plants covered the land during warmer seasons. Many large mammals, including reindeer, musk-oxen, and woolly mammoths, roamed the land. By the end of the latest ice age, modern humans were living south of the glaciers as well.

Causes and Effects

Scientists are not sure what caused the ice ages. Changes in Earth's orbit around the sun may be one cause. These changes would have caused parts of Earth to receive less heat from the sun at certain times. Another possible cause is changing amounts of dust and gases in the air. More dust and fewer gases could have caused Earth's surface to cool.

Whatever its cause, the latest ice age left lasting marks on the land. The creeping ice carried gravel, sand, soil, clay, and even boulders. When the ice melted, these materials were left behind in ridges, piles, and other formations. Many lakes formed in places where the ice melted.

► More to explore

Earth • Geology • Glacier • Prehistoric Life

Iceberg



Only a small part of a giant iceberg shows above the surface of the ocean.

A huge chunk of ice floating in the ocean is called an iceberg. Many icebergs are the size of houses or large buildings. Most of their size, however, is hidden underwater. Icebergs can easily damage or destroy passing ships.

Icebergs come from glaciers, or large masses of slowly moving ice. In a process called calving, pieces of a glacier break off into the ocean. The pieces, or icebergs, can drift for thousands of miles. When they reach waters that are warm enough, they melt.

The largest icebergs ever seen were miles across and hundreds of feet high. Although icebergs are extremely heavy, they float for the same reason that an ice cube floats in a glass of water: ice is less dense, or lighter, than water.

► More to explore

Glacier

Ice Hockey

► see Hockey, Ice.



Iceland

The island country of Iceland is a scenic land of volcanoes and glaciers. Though its closest neighbor is Greenland, it is a part of Europe. The capital is Reykjavík.

Geography

Iceland lies in the Atlantic Ocean just south of the Arctic Circle. About 200 volcanoes dot the island. Iceland is also known for its glaciers, or large sheets of ice. Winters are mild and windy, and summers are damp and cool.

Plants and Animals

Plant life covers only about one fourth of Iceland. Bogs, moors, and sparse grasslands are common. Animals include foxes and reindeer. Many fish, whales, and seals live in Iceland's waters.

People

Nearly all the people are Icelandic, mainly descendants of early settlers from Norway. The main language is Icelandic.



A volcano formed Crater Víti in Iceland.

Most people are Christians. Most of the people live in cities and towns along the coast.

Economy

Transportation, tourism, and technology are vital to the economy. Fishing is also important. Manufacturers make food products and aluminum. Farmers raise sheep and dairy cattle.

History

Iceland was one of the world's first independent, democratic republics. Its mainly Nordic settlers formed a legislature called the Althing in AD 930. Norway ruled Iceland from 1262 to 1380, when Denmark took over. Iceland regained independence in 1944. In 1980 Iceland elected Vigdís Finnbogadóttir as the world's first woman president.

► More to explore

Glacier • Reykjavík • Volcano

Facts About ICELAND



Population
(2008 estimate)
315,000

Area
39,741 sq mi
(102,928 sq km)

Capital
Reykjavík

Form of government
Republic

Major cities
Reykjavík,
Kópavogur,
Hafnarfjörður,
Akureyri,
Gardabær

Ice Skating

Ice skating is both a pleasant hobby and a competitive sport. Ice skaters glide across ice wearing skates—shoes or boots with metal blades attached to the bottom. People skate for fun both outdoors and indoors. They skate on all kinds of ice surfaces, from a small frozen pond to a large indoor arena.

Competitive skating consists of two sports: figure skating and speed skating. Both are events at the Winter Olympic Games. Figure skaters also perform in ice shows around the world. The team sport of ice hockey involves skating as well. Ice hockey is played in schools, in professional leagues, and at the Olympic Games.

Ice Skates

There are three basic types of ice skates: figure skates, speed skates, and hockey skates. Figure skates are the best type of skate for pleasure skating. A figure skate has a tall boot that extends above the ankle. The blade on a figure skate is about as long as the boot. Each skate has a toe pick, a jagged-toothed edge at the front of the blade. Figure skaters use toe picks to brace themselves when they leap into the air.

Speed skates are designed for racing. A speed skate has a long blade attached to a low-cut boot.

A hockey skate has a shorter blade that is curved at the ends. This design allows hockey players to make quick turns at high speed. A hockey boot is hardened



Hockey players, figure skaters, and speed skaters wear different types of skates.

to protect the player's foot. A stiff toe box in the front provides extra protection for the toes.

Figure Skating

Figure skating has been an Olympic event since 1908. That was before there were separate summer and winter Olympic Games. Figure skating has become one of the most popular sports in the Winter Games.

Figure skaters perform routines that involve jumps, spins, and dance moves. They perform the routines to music. Judges decide the winner in contests of figure skating. The skaters are judged on how well they do their routines. They are also judged on how artistic they are.



Figure skaters perform artistic routines on the ice.

Until the 1990s figure skaters were also judged on figures, or patterns, that they had to make with their skates on the ice. This was how figure skating got its name.

Figure skaters compete as individuals or in male and female pairs. Ice dancing is another event that features a man and a woman skating together. It became a separate Olympic event in 1976. Ice dancing is similar to ballroom dancing.



Speed skating is a type of ice skating. Speed skaters wear smooth, close-fitting clothing to cut air resistance at high speed.

Speed Skating

Speed skating and short-track speed skating are racing events. Speed skating has been an Olympic sport since 1924. Short-track races were first held at the 1992 Olympics. Speed skaters race two at a time around a track, but they do not race each other. Instead, after all the competitors have skated, the skater with fastest time wins. Short-track racers compete against each other. Several skaters race around a short track in a high-speed dash to the finish line. Teams of four compete in short-track relay races.

History

Ice skating probably started in northern Europe as early as 1000 BC. The first skates were made from the bones of elk, oxen, reindeer, and other animals. Skating became especially popular in the Netherlands, which has many artificial waterways called canals. In the winter skaters used the canals to get from place to place. Skating on frozen ponds was popular in England during the 1600s. The English later introduced skating to North America.

The first indoor skating building, called an ice rink, opened in London, England, in 1876. It had artificially frozen ice. Three years later the first indoor ice rink in the United States opened at Madison Square Garden in New York City. Indoor ice rinks provide a place for people to skate even during warm weather. They also host large ice shows featuring well-known skaters.

► More to explore

Hockey, Ice • Olympic Games • Skating

Idaho

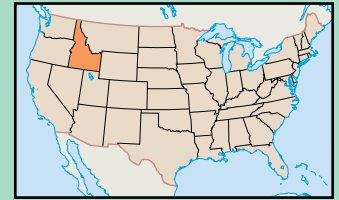
Most of the U.S. state of Idaho lies in the highlands of the Rocky Mountains. The state is known for its natural beauty. In addition to towering mountains it features evergreen forests, high waterfalls, and steep canyons.

There has been much confusion surrounding the origin of the state's name. Many people now think that the name was made up by a politician. Idaho is nicknamed the Gem State. Its official gemstone is the Idaho Star Garnet. Boise is the capital.

Geography

Located in the northwestern United States, Idaho is bordered by six other

states. Montana and Wyoming lie to the east, Utah and Nevada to the south, and Oregon and Washington to the west. The Canadian province of British Columbia lies to the north.



The Rocky Mountains cover most of the northern half of the state. They also run along the state's southeastern border. In the southern part of the state a large plain covers the area around the Snake River. In the west the Snake River flows through Hells Canyon. It is the deepest gorge in the United States.

At 12,662 feet (3,859 meters), Borah Peak in the Rocky Mountains is the state's highest point. In general, Idaho's climate is mild. The mountain areas are cooler than the southern plains area. The mountains sometimes receive large amounts of snow.

People

The state was settled by people who moved from the eastern United States. Whites of European heritage still represent more than 90 percent of Idaho's population. Hispanic Americans make up more than 7 percent of the state's population.

Boise is the largest city in Idaho. Located in southwestern Idaho, it is the state's center of business and government. Nampa is a large city not far from Boise. The cities of Pocatello and Idaho Falls are located in southeastern Idaho.



Facts About IDAHO

Flag



Population

(2000 census),
1,293,953—
rank, 39th state;
(2008 estimate)
1,523,816—
rank, 39th state

Capital

Boise

Area

83,570 sq mi
(216,446 sq
km)—rank, 14th
state

Statehood

July 3, 1890

Motto

Esto Perpetua (It
Is Forever)

State bird

Mountain
bluebird



State flower

Syringa



Economy

Tourism is a major part of Idaho's economy. Sun Valley is one of the state's many winter skiing resorts. The Boise area is the site of high-technology firms. These companies manufacture computer parts and laser printers. Idaho's farms yield dairy products, cattle, potatoes, and wheat. Food processing is an important industry. Many of Idaho's famous potatoes are processed into french fries and then packaged for shipping.

History

Native Americans had lived in the area that is now Idaho for at least 10,000 years before white explorers arrived. In the early 1800s the largest Native American groups in the area were the Nez Percé and the Shoshone.

In 1805 explorers led by Meriwether Lewis and William Clark were the first white people to explore the region. For much of the early 1800s, fur trappers were the main visitors. In the 1830s a fur-trading company known as the Hudson's Bay Company built forts in Idaho. The forts became stopover points on the Oregon Trail, a famous wagon route to the Northwest.

The discovery of gold on Orofino Creek in northern Idaho in 1860 started a gold rush. The population increased sharply as many miners arrived. Soon silver and lead mining began in the mountains.

The Idaho Territory was established in 1863. At first the territory was larger

than Texas. It included the land that is now Idaho and Montana and all of Wyoming except the southwestern corner. Later in the 1860s Montana and Wyoming were separated from it, leaving Idaho with its present borders.

Idaho was admitted to the Union in 1890 as the 43rd state. Federal troops were called in during the new state's early years to help break up a series of mining strikes. Southern Idaho faced problems between Mormons and other religious groups.

During the 1900s Idaho developed its agriculture, forestry, and manufacturing industries. In the early 21st century one of the issues of concern to the state was how to protect the quality of its scenic land.

► More to explore

Boise • Fur Trade • Lewis and Clark Expedition • Nez Percé • Oregon Trail • Shoshone



Idaho's Bitterroot Mountains attract hikers and others who enjoy the beautiful scenery. The Bitterroots are part of the Rocky Mountain range.

Iditarod



Dogs and a musher leave Anchorage at the start of the Iditarod race.

Every March the excitement of the Iditarod Trail Sled Dog Race grips Alaska. The race covers about 1,100 miles (1,770 kilometers) between the cities of Anchorage and Nome. Each sled is pulled by 12 to 16 dogs. The person driving the sled is called a musher.

The course length and route vary slightly from year to year. The race partially follows an old dogsled mail route. It crosses mountains and frozen rivers. Sled teams face cold temperatures and blowing snow. Champions have finished the race in less than 10 days. Most teams, however, take much more time than that.

Most mushers are from Alaska. The race also draws competitors from other states, Canada, and other countries. Men and women of all ages compete together. Susan Butcher and Rick Swenson are two of the most famous champions.

Sled dogs are chosen from breeds that do well in cold weather. Common

choices include Eskimo dogs, Siberian huskies, Samoyeds, and Alaskan Malamutes. Mushers train the dogs from puppyhood.

The Iditarod began in 1967 as a short race. It started as a way to celebrate the 100th anniversary of the U.S. purchase of Alaska. It developed into the current race in 1973.

► More to explore

Alaska • Dog

Iguana

Iguanas are reptiles that belong to a large family of lizards. They are often seen sunning themselves on branches overhanging water. If disturbed, they plunge into the water.

Most species, or kinds, of iguana live in the Americas. The best-known kind is the common, or green, iguana. It is found from Mexico south to Brazil. Two



Two iguanas cling to branches.

kinds of iguana live on the Galápagos Islands. Most iguanas like dry habitats, but some live in rain forests.

Most iguanas are green. Many have unusual sawlike teeth. They also have a scaly back and a fold of skin under the neck. The male common iguana grows up to 6.5 feet (2 meters) long and weighs up to 13 pounds (6 kilograms). The female is about half that weight.

Iguanas eat leaves, fruits, insects, small mammals, and birds. The marine iguana of the Galápagos Islands eats seaweed.

Iguanas are not as common in the wild as they once were. People have built on land where iguanas once lived. They also hunt iguanas and capture them to sell as pets. In rural areas some people eat iguanas. Cats, large birds, and other animals also eat young iguanas and iguana eggs.

► More to explore

Lizard • Reptile

Iguanodon

The second dinosaur ever to be discovered was *Iguanodon*. The name *Iguan-*

odon means “iguana tooth.” Scientists chose this name because the teeth of *Iguanodon* looked very similar to the teeth of modern iguanas. Scientists determined that dinosaurs were reptiles after the discovery of *Iguanodon*.

When and Where *Iguanodon* Lived

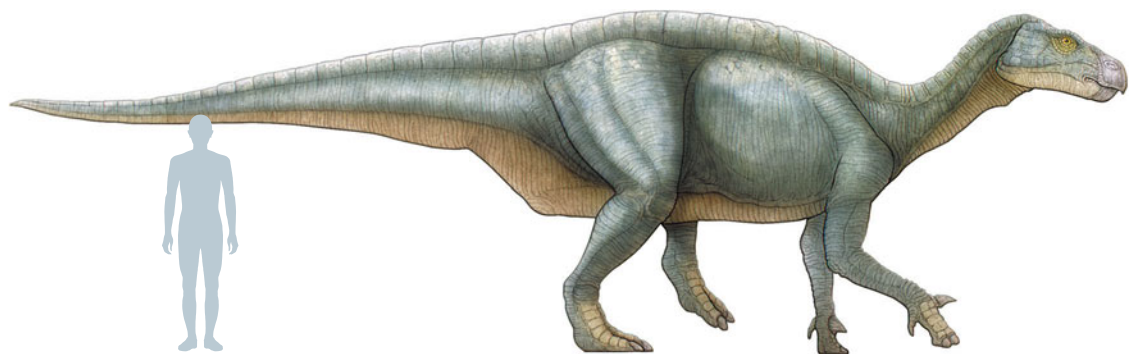
Iguanodon lived about 159 to 99 million years ago. Remains of *Iguanodon* have been found in Europe, Africa, Australia, Asia, and North America.

Physical Features

Iguanodon reached a length of about 30 feet (9 meters) and stood up to 16 feet (5 meters) tall. It weighed between 4 and 5 tons. The most distinctive feature of *Iguanodon* was its front feet with five fingers. The feet were something like hands. The dinosaur’s back legs were long and sturdy. The teeth of *Iguanodon* were ridged inside its large cheek pouches. A bony beak at the end of its snout replaced the front teeth.

Behavior

Iguanodon was a plant eater. Most of the time *Iguanodon* ate from plants that grew along streams and rivers. To reach



At first scientists thought that *Iguanodon* rested on its hind legs with its tail on the ground. Now scientists think that it usually stood on all four legs.

leaves in trees, it stood up on its two back legs, balancing itself with its tail. The spiked thumb of *Iguanodon* remains a mystery to scientists. It may have been used to tear down plants, as a weapon for self-defense, or against rival males during the breeding season. Remains of *Iguanodon* have been found in groups, which suggests that they roamed prehistoric Earth in herds.

► More to explore

Dinosaur

Illinois

The Illinois were a group of small Native American tribes that shared the same territory, language, and way of life. The tribes included the Cahokia, the Kaskaskia, the Michigamea, the Peoria, and the Tamaroa.

These groups originally lived in a large part of what is now Illinois. They also lived in parts of what are now Wisconsin, Missouri, Iowa, and Arkansas.

The Illinois built their villages along rivers. Their bark-covered homes were large enough to house many families. The Illinois grew corn, beans, and squash. After the planting season they left their villages to hunt bison (buffalo) on the prairies. They returned in late summer to harvest their crops.

French explorers and traders came to their lands in the 1670s. The Illinois soon became trading partners of the French.



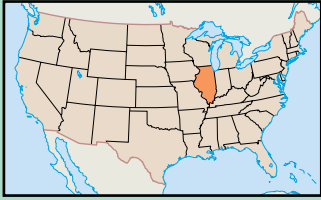
A member of the Peoria Tribe of Oklahoma poses for a photographer during the 1880s.

The Illinois began to decline soon after meeting the French. They suffered from diseases that the Europeans carried with them. The Illinois also fought with several neighboring tribes. In 1769 an Illinois killed Pontiac, a chief of the Ottawa people. This brought more attacks. The Illinois lost both land and people. In 1832 most of the remaining Illinois moved to what is now Kansas.

In the 1860s the U.S. government moved the Illinois from Kansas to a reservation in Indian Territory (now Oklahoma). They became known as the Peoria Tribe of Oklahoma. At the end of the 20th century there were about 1,400 Peoria living in the United States.

► More to explore

Native Americans • Pontiac



Illinois

The state of Illinois lies in the Midwestern heartland of the United States. It presents a striking contrast between city and small-town life. Illinois is generally thought of in two parts—Chicago and the rest of the state. Chicago is the country's third largest city. The city and its surrounding counties have a population of more than 8 million. Because Chicago is in the northern part of the state, the rest of the state is often referred to as Downstate. It consists of a mix of cities, farmland, and small towns. The Downstate population is about 4 million. Springfield is the state capital.

Illinois was named for the Illinois Indians. The state is popularly called the Land of Lincoln. Illinois was where Abraham Lincoln became a lawyer, entered politics, married, served as a congressman, and was nominated for the U.S. presidency in 1860.

Geography

Wisconsin borders Illinois on the north. To the west the Mississippi River separates Illinois from Iowa and Missouri. On the south the Ohio River forms the boundary with Kentucky. To the east is Indiana, with the Wabash River forming part of the boundary. The northeastern part of the state stretches along Lake Michigan for 63 miles (101 kilometers).

Illinois was called the Prairie State by its early explorers because of its vast grasslands. It is one of the most level states,

with an average elevation of about 600 feet (180 meters). Gradually sloping hills and shallow river valleys cover most of the state. The Ozark Mountains extend into Illinois from Missouri in the southwest corner. Another area of low plateaus enters Illinois from Indiana and Kentucky in the southeast. Illinois has warm summers and cold, sometimes snowy, winters.

People

Whites of European heritage make up the majority of the state's population. African Americans represent about 15 percent of Illinois's population. Hispanics make up 12 percent of the state's people.





The city of Chicago accounts for a large share of Illinois's population and economy.

Chicago is the leading metropolitan area of the Midwest. It is a center of finance, industry, and culture. Because of its location in the middle part of the country, it is also a center for air and rail travel. Several suburbs of Chicago, including Aurora, Naperville, and Joliet, are also among Illinois's largest cities. About one fifth of the state's people live in rural areas.

The main institutions of higher education are the University of Chicago; Northwestern University, in Evanston;

and the University of Illinois, with campuses in Urbana-Champaign, Chicago, and Springfield.

Economy

The economy of Illinois is diverse. The state is strong in finance, services, trade, manufacturing, government, transportation, and agriculture.

Illinois is a leading manufacturer of machinery. It also ranks among the top states in the manufacture of food products, fabricated metal products, and chemicals. The state is also a leader in printing, publishing, broadcasting, and telecommunications.

Illinois has ranked among the chief farming states since about 1850. The most valuable crops are corn and soybeans. More than one fifth of Illinois's farm production comes from the sale of livestock, especially hogs and cattle, and livestock products.



Cornfields and other farmland cover large areas of the state of Illinois. Corn and soybeans are the state's leading crops.

Facts About ILLINOIS

Flag



Population
(2000 census),
12,419,293—
rank, 5th state;
(2008 estimate)
12,901,563—
rank, 5th state

Capital
Springfield

Area
57,914 sq mi
(149,998 sq
km)—rank, 25th
state

Statehood
December 3,
1818

Motto
State Sovereignty,
National Union

State bird
Cardinal



State flower
Violet





The Lincoln Home National Historic Site is located in Springfield, Illinois. It features the house that Abraham Lincoln lived in for 17 years before he became president of the United States.

History

Native American settlement in Illinois dates from about 8000 BC. Beginning in about AD 800 Indians known as the Mississippian people lived in the region. They left behind thousands of earth mounds that they had built up from the prairie. The largest of these is Monks Mound, in Cahokia in southwestern Illinois. A number of Native American peoples lived in the area when Europeans arrived.

The French explorers Louis Jolliet and Jacques Marquette entered the region in 1673. Illinois was controlled by the French until 1763, when it passed to the British. In 1778 George Rogers Clark claimed the region for the United States. The first settlement on the site of Chicago was made in 1779 by black pioneer Jean-Baptist-Point du Sable.

Illinois was officially given over to the United States in 1783, at the end of the American Revolution. It became the

21st state on December 3, 1818. Some 250,000 Illinoisans fought for the Union during the American Civil War.

In 1871 fire swept through Chicago, destroying a third of the city. However, the fire proved only a temporary setback in the city's rapid growth. Many people moved there to help rebuild the city. The workers were not always treated well. Soon they began to ask for better working conditions. By the end of the 1800s Illinois was a main focus of the labor movement. Chicago was the site of several violent confrontations between workers and police. The two most famous events were the Haymarket Square Riot of 1886 and the Pullman Strike of 1894. In spite of this, Chicago and the rest of Illinois underwent tremendous economic and cultural growth.

The two parts of the state did not always grow equally, however. The interests of the big city and the small towns were not always the same. This is reflected in the state's politics. Since the Civil War, the Republican and Democratic parties have competed for power in Illinois. Chicago is strongly Democratic. Much of the rest of the state is Republican. Most of Chicago's suburbs are Republican as well.

► More to explore

American Civil War • Chicago • Du Sable, Jean-Baptist-Point • Illinois, People • Jolliet, Louis • Labor • Lincoln, Abraham • Marquette, Jacques • Springfield

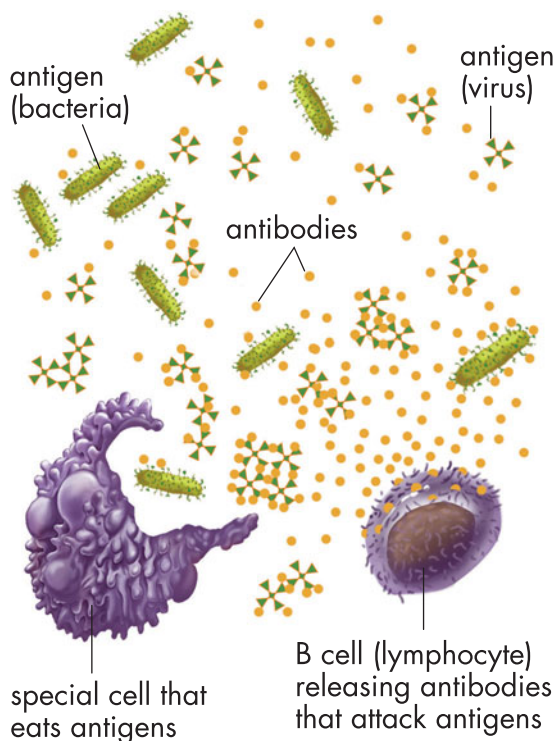
Immigration

► see Migration, Human.

Immune System

Most living things try to protect themselves from harm. Animals have a special protection called the immune system. The immune system protects the body from substances called antigens. Some of the most harmful antigens are germs like viruses and bacteria, which cause illness. Parts of the immune system block antigens from entering the body. Other parts destroy the antigens that do enter.

The protection given by the immune system is called immunity. Humans and



Special cells that eat antigens are a part of natural immunity. B cells that release antibodies are a part of acquired immunity.

some animals have two basic types of immunity: natural and acquired.

Natural Immunity

All animals, including humans, have natural immunity. It works against any antigen that enters or tries to enter the body. Skin is a part of natural immunity. It blocks many things from entering the body. Mucus in the nose also blocks antigens. In addition, most animals produce special chemicals and cells that attack antigens inside the body.

Acquired Immunity

Only human beings and other animals with backbones have acquired immunity. With this kind of immunity, certain cells in the body can “remember” the types of antigens they have attacked in the past. This “memory” allows the acquired immune system to attack these antigens more strongly the next time they enter the body.

Certain white blood cells, called lymphocytes, are important parts of the acquired immune system. There are two different kinds of lymphocytes: B cells and T cells. B cells release products called antibodies, which attack antigens. T cells are divided into helper cells and killer cells. Helper T cells produce substances that help new lymphocytes grow. Killer T cells destroy cells in the body that are infected by antigens.

Because of acquired immunity, people get certain diseases, like chicken pox, only once. Acquired immunity is also what makes vaccines work.

Did You Know?

The spleen is part of the human immune system. It is a small organ that removes bacteria from the blood.

Problems with the Immune System

The two types of immunity normally work together to protect the body from harmful invaders. But sometimes the immune system does not work properly. It may spot and try to destroy cells that a doctor has put into the body on purpose. For example, the immune system may attack a healthy kidney that has been transplanted into a patient.

The immune system may also overreact to antigens that are not really harmful to the body. Allergies are an example of this type of problem. When some people breathe in pollen from plants or eat certain foods, the immune system attacks the pollen or food particles. The attack causes sneezing, itching, or other symptoms.

Another possible problem with the immune system is called an autoimmune response. This happens when lymphocytes see normal, healthy cells as antigens and attack them. Rheumatoid arthritis is an example of an autoimmune disease. In this disease, lymphocytes attack the joints between bones.

A serious disease of the immune system is AIDS, or acquired immunodeficiency syndrome. It is caused by a virus that attacks the immune system's helper T cells. As the T cells die, the immune system cannot protect the body from other dangerous infections.

► More to explore

AIDS • Allergy • Vaccine

Did You Know?

Fever, pain, redness, and swelling are signs that the immune system is fighting antigens.

Impeachment

Impeachment is a process by which a government official is charged with a crime. A legislature, or lawmaking body, handles an impeachment.

In the United States the two houses of Congress carry out impeachments. First, the House of Representatives impeaches, or brings charges against, an official. When the House impeaches an official, it does not mean that he or she is guilty of a crime. It means that there is evidence that the official may have committed a crime.

The Senate then holds a trial and acts as the judge. After hearing the evidence, the senators vote on whether the official is guilty or not guilty. Two thirds of the senators must vote guilty for the official to be convicted, or found guilty. If convicted, the official must leave his or her job.

The impeachment process is rarely used in the United States. The only U.S. presidents to be impeached were Andrew Johnson, in 1868, and Bill



When a U.S. government official is impeached the Senate holds a trial to decide if the official is guilty.

Clinton, in 1998. The Senate found both of them not guilty.

In the United Kingdom the two houses of Parliament handle impeachments. The House of Commons impeaches an official, and the House of Lords serves as the judge. Impeachment was once fairly common in England. However, there have been no impeachments in the United Kingdom since 1806.

► **More to explore**

Clinton, Bill • Congress of the United States • Johnson, Andrew • Legislature

Imperialism

► see Empire.

Inca

The Inca people once ruled a vast empire in the Andes Mountains of South America. Their capital was Cuzco, in what is now Peru. The Inca Empire included about 12 million people at its peak in the early 1500s.

How the Inca Lived

The Inca grew such crops as corn, squash, tomatoes, peanuts, and cotton. Inca farmers were the first to grow potatoes. They also raised guinea pigs, ducks, alpacas, and dogs. The Inca rode animals called llamas and also used them as work animals.

The Inca made clothing from llama wool and cotton. They made pottery



The remains of an Incan fortress stand on a hilltop near Cuzco, Peru.

and musical instruments. They also made things out of metal.

The Inca built their houses using stone or adobe (sun-baked clay). The ruins of the Inca city of Machu Picchu are famous for their well-made buildings.

The Inca spoke a language called Quechua. They had no form of writing. However, they kept records using a complicated system of colored knotted cords called quipus.

History

According to the traditional belief of the Inca, they originally came from a village called Paqari-tampu. In the 1100s they moved north and settled in Cuzco. In the early 1400s the Inca began to attack neighboring peoples and take control of their lands. Within 100 years the Inca Empire was at the height of its power.

The Spanish began to explore Peru in the 1520s. By 1533 Spanish soldiers led by Francisco Pizarro had captured Cuzco. They brought the Inca Empire

under Spanish control. Today the descendants of the Inca live in the Andes Mountains. They make up almost half of Peru's population.

► **More to explore**

Andes • Machu Picchu • Peru

Independence Day

Many countries celebrate the day that they became independent. In the United States that day is the Fourth of July, which is also called Independence Day. Independence Day marks the birth of the United States as a new country. On July 4, 1776, the leaders of the new country signed the Declaration of Independence.

How Independence Day Is Celebrated

Everywhere in the United States, Independence Day is an all-day celebration. Many people have the day off from work. They spend time with family and

friends. They attend picnics, barbecues, and parades during the day. At night many Americans gather to watch fireworks. Some also go to concerts where patriotic music is played.

Some people wear red, white, and blue clothes on July 4. Many people hang U.S. flags outside their homes.

History

In the 1700s Great Britain ruled the 13 American colonies that would become the United States. Many American colonists were unhappy with the British government. The colonists did not want to pay taxes unless they had a say in the government. They protested against what they called "taxation without representation."

In 1775 the colonists began to fight for their freedom from Great Britain. In June 1776 Thomas Jefferson wrote the first draft of the Declaration of Independence. He gave it to the members of the Continental Congress, who made a few changes. The members then signed the new version on July 4, 1776.

The first Independence Day celebrations included parades and political speeches. By the late 1800s people were celebrating the holiday in the same ways that Americans do today. Independence Day is now a major summer holiday.

► **More to explore**

Declaration of Independence • United States



People carry a huge U.S. flag in an Independence Day parade in Atlanta, Georgia.

India

More people live in India than in any other country in the world except China. India's culture is one of the oldest and richest in the world. The capital is New Delhi.

Geography

Much of India's territory is a peninsula that extends into the Indian Ocean. To the west of the peninsula is the Arabian Sea, and to the east is the Bay of Bengal. India shares borders with Pakistan, China, Nepal, Bhutan, Bangladesh, and Myanmar.

The high Himalayas rise in the north. South of the mountains is a plain of soil left behind by the Indus, Ganges, and Brahmaputra rivers. The Indus River gave the country its name. The Ganges is sacred to followers of Hinduism. In the northwest is the Thar Desert. Most of the south is fairly flat. Along the coasts are low mountains called the Western and Eastern Ghats.

India's climate is controlled by monsoons, or winds that change direction each season. Most of the country has three seasons: a hot, dry spring; a hot, wet summer; and a cool, dry winter.

Plants and Animals

Tropical evergreen forests grow in rainy areas. In less rainy regions trees lose their leaves during the cool, dry season. Dry regions have thorny shrubs and grasses. Some 100 types of palm tree also grow in the country.

India's wildlife includes tigers, lions, leopards, elephants, rhinoceroses, bears, and deer. Monkeys and cows are common even in cities. The peacock is the national bird. The best-known reptile is the cobra.

People

India has a mixture of peoples who have blended together since ancient times. They speak many languages, including Hindi, Bengali, Telugu, Marathi, Tamil, Urdu, Gujarati, Kannada, Malayalam, Oriya, Punjabi, and Assamese. Many Indians speak Hindi or English as a second language. About three fourths of Indians are Hindus. Muslims form the next-largest religious group. Others follow Christianity, Sikhism, Buddhism, Jainism, or other religions.

Most Indians live in villages. Indian cities are generally very crowded.





The Clock Tower and the Golden Temple in Amritsar, India, are important buildings of the Sikh religion.

Indians are divided into social groups known as castes. People are born into these groups, each of which has its own traditional occupations, diet, and customs.

Economy

Services—including computer work, communications, transportation, and tourism—are India's most valuable economic activities. Industry is also important. Factories produce textiles, chemicals, processed foods, iron and steel, electronics, automobiles, and cement. Mining provides coal, oil, iron ore, and limestone.

Agriculture employs the most Indian workers. Crops include grains, sugarcane, fruits, beans, cotton, jute, tea, coffee, rubber, and spices. India raises more cattle and water buffalo than any other country in the world. Because cows are holy to Hindus, Indians often use cattle as work animals instead of killing them for their meat.

Facts About INDIA



Population
(2008 estimate)
1,147,996,000

Area
1,222,559 sq mi
(3,166,414 sq km)

Capital
New Delhi

Form of government
Republic

Major cities
Greater Mumbai (Greater Bombay), Delhi, Kolkata (Calcutta), Bangalore, Chennai (Madras)

History

India's history goes back to ancient times. By about 2500 BC the Indus Valley civilization had extended from what is now Pakistan into northwestern India. Between 1500 and 1200 BC tribes of people known as Aryans invaded northwestern India and spread eastward.

The Mauryan Empire, which lasted from about 321 to 185 BC, united most of what is now India. The Hindu Gupta Dynasty ruled from about AD 320 to 540. The Guptas encouraged literature, music, drama, painting, and sculpture.

Muslim Rule

Muslims began invading India in the 700s. In 1206 they set up a sultanate, or kingdom, centered in Delhi. The greatest of all the Muslim states in India was the Mughal Empire, which defeated the Delhi sultanate in 1526. By the late 1600s it had spread over almost all of India.

British Rule

Meanwhile, in 1498 the Portuguese navigator Vasco da Gama sailed to India. The Dutch, the British, and the French soon challenged Portugal for trade with India. By 1849 Great Britain's East India Company ruled almost all of India. After a rebellion by Indian soldiers, the government of Britain took direct control of India in 1858.

British rule brought peace and some economic growth. However, many Indians wanted their own government. In 1885 some of the people formed a political party called the Indian National



Indian women celebrate Pongal, a Hindu festival. During Pongal people offer rice boiled in milk to the gods.

Congress. In 1920 Mahatma Gandhi, a leader of the Congress party, began urging Indians to resist British rule. He asked them to protest British laws peacefully, not violently.

Independence

India won full independence in 1947. However, some of its land was set aside

to create the Muslim country of Pakistan. Fighting soon broke out between India and Pakistan. After a war in 1971, East Pakistan became the new country of Bangladesh. India and Pakistan continued to fight over the territory called Kashmir into the 21st century.

Within India, ethnic and religious conflicts led to the assassinations of two prime ministers, Indira Gandhi in 1984 and her son Rajiv in 1991. India also faced a growing population and widespread poverty. Despite those problems, the country maintained a democratic government. It also developed nuclear technology and a strong computer industry. In 2004 Manmohan Singh became the first Sikh to serve as India’s prime minister.

► More to explore

- Caste • Delhi • Gandhi, Mahatma
- Ganges River • Himalayas • Hinduism
- Indus River • Indus Valley Civilization
- Mauryan Empire • Mughal Empire
- Pakistan



TIMELINE

The Indus Valley civilization extends into India.		The Gupta Dynasty takes power.		The British government takes over India.		Prime Minister Indira Gandhi is assassinated.
about 2500 BC	321 BC	320 AD	1526	1858	1947	1984
The Mauryan Empire begins.		The Mughal Empire begins.		India gains independence.		



Indiana

The U.S. state of Indiana calls itself the Crossroads of America

because it sits in the heart of the Midwest. Indiana's people are often called Hoosiers, though it is unclear where the name came from. Indiana took its name from the word Indian; with the addition of the letter *a*, it means "Indian land." The state capital is Indianapolis.

Geography

Indiana borders Lake Michigan and the state of Michigan on the north, Ohio on the east, Kentucky on the south, and Illinois on the west. The Ohio River forms the southern border, and the Wabash River forms part of the western border.



The landscape of Indiana is generally flat. The northern third has a gently rolling landscape. In the northwest, windblown sand dunes rise along Lake Michigan. A larger plains area in the middle of the state has rich soil, making it great for farming. The land changes along the Ohio River in the south-central and southwestern parts of the state. This region has many sharp ridges, rounded hills, and deep valleys. Indiana has warm summers and cool winters. Northern cities along Lake Michigan receive much heavier snowfall than other parts of the state.

People

The majority of Indiana's residents are white, native-born Americans. Most trace their ancestry back to England, Scotland, Ireland, and Germany. African Americans are the largest minority group, making up more than 8 percent of the population. Five of Indiana's cities have populations of more than 100,000.

Indianapolis is the largest city in Indiana. It is located near the center of the state. Other large cities are Fort Wayne, Evansville, South Bend, and Gary. The state's institutions of higher education include Indiana University, with its main campus at Bloomington, and Purdue University, with its main campus at West Lafayette. The University of Notre Dame, near South Bend, is a well-known Roman Catholic university.



Colorful fall foliage attracts visitors to Brown County State Park in Nashville, Indiana.

Economy

Indiana is among the nation's top manufacturing states. The main products include motor vehicles and parts, engines, steel, electronic equipment, chemicals, and musical instruments. Other important areas of the economy are finance, government operations, and service-oriented businesses. Indiana's farms yield corn, soybeans, hogs, and dairy products.

History

The first people to live in the area were prehistoric Native Americans. Archaeologists have found remains of these people at Angel Mounds, a site in southwestern Indiana. The major tribes living in the region when Europeans arrived included the Miami, the Potawatomi, and the Delaware (or Lenni Lenape).

In 1679 the French explorer Sieur de La Salle became the first European to enter

the area. France later claimed the region but in 1763 turned over the territory to Great Britain. The United States acquired the land at the close of the American Revolution in 1783.

Fear of Indian attacks kept settlers from the region for many years. After the Indiana Territory was created in 1800, its first governor, William Henry Harrison, did much to open the land for settlement. In 1811 he defeated a group of Indians at the battle of Tippecanoe. Indiana became a state in 1816. Industry began to grow in the state during the Civil War. In the 1900s manufacturing became more important to the economy than agriculture. In the early 21st century, it continued to lead Indiana's economy.

► More to explore

Harrison, William Henry • Indianapolis

Facts About INDIANA

Flag



Population
(2000 census),
6,080,485—
rank, 14th state;
(2008 estimate)
6,376,792—
rank, 16th state

Capital
Indianapolis

Area
36,418 sq mi
(94,321 sq km)—
rank, 38th state

Statehood
December 11,
1816

Motto
The Crossroads of
America

State bird
Cardinal



State flower
Peony



Indianapolis



Population
(2000 census),
city, 791,926;
(2007 estimate)
795,458

Indianapolis is the capital of the U.S. state of Indiana. The city lies on the White River. It is famous for hosting a yearly sports event—the Indianapolis 500 car race. The race brings thousands of visitors to the city each May.

Indianapolis is a center of road, rail, and air transportation. Farmers from the area sell grain in the city. It is also a center of business, banking, and industry. Factories in Indianapolis make medicines, machinery, cars, telephones, and other products. There are also several universities.

In 1820 the government of Indiana chose a site in the center of the state to be the new capital. Indianapolis was built there. It became the official state capital in 1825.

A racetrack called the Indianapolis Motor Speedway was built in the early 1900s. The first Indianapolis 500 race was held there in 1911. Today the city is also home to professional basketball and football teams.

The Children's Museum of Indianapolis opened in 1925. It has become the largest museum for children in the world.

► More to explore

Indiana

Indian Ocean

Long before the larger Atlantic and Pacific oceans had been well explored, the Indian Ocean was a bustling region of travel and trade. More than 2,000 years ago, traders sailed the ocean to exchange goods between India, Africa, and Arabia.



Physical Features

The Indian Ocean is surrounded by four continents: Asia to the north, Antarctica to the south, Africa to the west, and Australia to the east. The Indian Ocean is the third largest of Earth's oceans. Its total area measures about 28,360,000 square miles (73,440,000 square kilometers).

The largest island in the Indian Ocean is Madagascar, which lies off the east coast of Africa. Madagascar and some of the

other islands in the ocean were once attached to a continent. Volcanoes formed other islands, including Sumatra (a part of Indonesia). Some of the ocean's islands, such as those in Maldives, are coral atolls. These are ribbons of coral reef that formed around the tops of underwater volcanoes.

Climate

Much of the Indian Ocean lies within the tropical and temperate zones. Temperatures are mild to hot. Winds called monsoons also affect the climate. Monsoons change direction according to the season. From October through April the winter monsoon blows from the northeast. It brings rain to Indonesia and Australia. From May to September the summer monsoon blows from the southwest. It brings rain to South Asia.

Destructive storms known as cyclones often form over the Indian Ocean. Cyclones generally move toward shore in a westward direction.

Economy

The Indian Ocean has played a significant role in shipping and trade for many years. The strong monsoon winds made ancient trade routes possible. The northeast monsoon carried traders from India and China to Arabia and Africa. The southwest monsoon carried traders in the opposite direction. The Indians and Chinese exchanged spices, silk, and gemstones for coffee, ivory, salt, and gold from Arabs and Africans.

Trade along the shipping lanes of the ocean continues today. Petroleum, or



Fishing boats dot a bay off an Indonesian island in the Indian Ocean.

oil, and oil products now make up much of the trade. The ocean contains valuable reserves of oil. It also provides shrimp, fish, and other seafood to countries.

Exploration

Sailors from India, Egypt, and Phoenicia (in the Middle East) were the first to explore the Indian Ocean. They did this between 3000 and 1000 BC. Europeans did not begin to explore the ocean until the 1500s. The Spanish first crossed the ocean from east to west in 1521. Captain James Cook of Great Britain explored the southern waters of the Indian Ocean in 1772.

Environmental Issues

Waste from factories and cities has polluted the Indian Ocean. In addition, there is concern about the amount of oil being transported in ships on the ocean. Oil spills have harmed fish and other animals.

► More to explore

Atlantic Ocean • Ocean • Pacific Ocean



Indonesia

The country of Indonesia is made up of about 13,670 islands. It is the largest country, both in area and in population, in Southeast Asia. The capital is Jakarta.

Geography

Indonesia's islands lie along the equator between the Indian and Pacific oceans. Five of the islands make up more than 90 percent of the land area. These are Sumatra; Java; Sulawesi; southern Borneo, known as Kalimantan; and western New Guinea, known as Papua.

Most of the islands are mountainous. Indonesia has many active volcanoes. The area is also known for earthquakes. Indonesia's climate is hot and humid.

Plants and Animals

Tropical rain forests cover much of Indonesia. Swamps with mangrove trees

are found in coastal lowlands. Indonesia's wildlife includes rhinoceroses, orangutans, tapirs, tigers, and elephants. A giant lizard, the Komodo dragon, lives on a few small islands. The Komodo dragon can be more than 10 feet (3 meters) long. Among Indonesia's birds are cockatoos, bowerbirds, and birds of paradise. Peacocks live on the island of Java.

People

Indonesia has more than 300 different ethnic groups. Most of the groups have East Asian roots. The largest group is the Javanese, who live mainly on Java. On the eastern islands most of the people are related to the Melanesians of Oceania. Chinese people form a small but important group. About 250 languages are spoken, but Indonesian (also called Bahasa Indonesia) is the main language.





A boy carries jackfruit on a pole across his shoulders in Sumatra, Indonesia.

Most of the population practices Islam. Other religions include Christianity, Hinduism, Buddhism, and traditional beliefs. Most people live in rural areas, but the cities are growing. More than half of Indonesia's population lives on Java.

Economy

Industry is a major part of Indonesia's economy. Manufactured products include machinery, chemicals, clothing, electronics, and wood products. Indonesia also produces oil and natural gas. Its mines provide bauxite (from which aluminum is made), copper, nickel, silver, and gold.

Agriculture employs about 40 percent of the workforce. The staple crop is rice. Indonesia is also a major supplier of natural rubber, made from rubber trees. Other cash crops include palm oil, sugarcane, coffee, and coconuts. Goats, cattle, and sheep are raised. The waters surrounding Indonesia allow for a fishing industry.

History

The ancestors of modern Indonesians migrated to the islands from mainland Asia thousands of years ago. From the 600s to the 1500s Buddhist and Hindu kingdoms existed in Indonesia. In the 1200s Muslim traders from India brought Islam to Sumatra. The religion spread to the other islands, except for Bali, which remained Hindu.

Dutch Rule

The Portuguese arrived in Indonesia in the early 1500s. The Dutch (people from The Netherlands) and the English followed. By the late 1600s the Dutch controlled almost all the islands. They lost control of Indonesia in 1942, when the Japanese invaded during World War II. After the Japanese surrendered in 1945, The Netherlands tried to regain control. In 1949, however, the Dutch granted Indonesia independence.

Independence

In 1965 Indonesia's first president, Sukarno, was overthrown. General Suharto came to power. Widespread protests forced him to resign in 1998. Indonesia held free elections in 1999. Later presidents faced the problems of terrorism and rebellion in parts of Indonesia.

In late 2004 one of the largest earthquakes ever recorded struck off the northwestern coast of Sumatra. It caused a giant wave, called a tsunami, that killed more than 200,000 people.

► More to explore

Jakarta • Tsunami

Facts About INDONESIA



Population
(2008 estimate)
234,342,000

Area
730,024 sq mi
(1,890,754 sq km)

Capital
Jakarta

Form of government
Republic

Major cities
Jakarta, Surabaya, Bandung, Medan, Bekasi

Indus River

One of the great rivers of the world, the Indus has long been a vital feature of the land now covered by India and Pakistan. The Indus Valley was the site of one of the world's earliest civilizations. The hymns of ancient India speak of the river, which is the source of the country's name.

The Indus River is about 1,800 miles (2,900 kilometers) long. It starts high in the Himalayas in the Tibet region of China. For about 500 miles (800 kilometers) the Indus flows through some of the world's tallest mountains. It passes through northwestern India, the territory of Kashmir, and northern Pakistan. Much of the river's water comes from the melting of glaciers and snow in the mountains.

After leaving the mountains the Indus flows onto the plains of Pakistan. In the region called Punjab, several rivers empty into the Indus and make it much wider. The Indus empties into the Arabian Sea.



Did You Know?

In 1960 India and Pakistan signed a treaty in which they agreed to share the waters of the Indus.



When snow melts from the mountains or rain falls on the land, the Indus River rises. Flooding happens when the river overflows its banks.

The Indus is very important to the economy of the region through which it flows. Although much of the land is very dry, farming is possible because river water is used for irrigation. The main crops grown in the region are sugarcane, wheat, rice, and cotton. Fish caught in the river include hilsa and trout. The shallow area where the river empties into the sea has a lot of shrimp.

► More to explore

India • Indus Valley Civilization
• Irrigation • Pakistan

Industrial Revolution

The Industrial Revolution was a period of major changes in the way products are made. It took place more than 200 years ago and greatly affected the way people lived as well as the way they

worked. In earlier days, people made products by hand. They worked mostly in their own homes or in small workshops. During the Industrial Revolution, many factories were built. Laborers began making large numbers of things using machines powered by engines.

England was the first country in which these changes took place. However, the Industrial Revolution soon spread to other European countries, the United States, and Japan.

Developments

The Industrial Revolution began in the cloth industry. Before that time making cloth was a slow process. After the wool was gathered it had to be spun into yarn and then woven into fabric by hand. In 1733 an invention called a flying shuttle made it easier to weave cloth. A machine called a spinning jenny, invented in 1770, made it easier to spin yarn. In 1793 Eli Whitney invented a machine called a cotton gin. It helped clean cotton after it was picked.

Whitney also came up with the idea of interchangeable parts. Before that time a worker who was skilled at making one type of product would spend a great deal of time making a single product by hand. Whitney discovered that a machine could make many copies of the individual parts of a product at once; the parts could then be assembled by any worker. This meant that many goods could be produced quickly. Soon factories were set up to produce these goods.

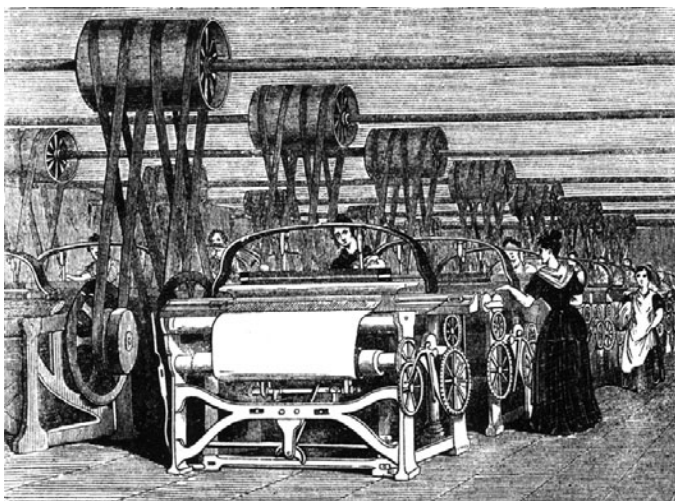


Before the Industrial Revolution people made clothing and other products at home. To make cloth they had to spin wool into yarn on a spinning wheel and then weave the yarn into cloth by hand.

Factories and the machines in them needed power sources. In the early 1700s people discovered how to build steam engines. In the late 1700s James Watt invented a steam engine that could run factory machines.

The Industrial Revolution soon spread to all kinds of production. Farmers, for instance, began to invent new machines to plow fields and plant crops.

Factory owners needed ways to bring large amounts of raw materials to their factories. They also needed ways to deliver the products that they made to customers in many places. Their demands led to many improvements in the transportation system. The U.S. inventor Robert Fulton perfected the steamboat in 1807. The British inventor George Stephenson put a steam engine on wheels and put the wheels on rails in 1825. The result was a railroad.



During the Industrial Revolution people invented looms that ran on steam or other power sources. These power looms wove cloth faster than ever before.

Impact on Society

By the late 1700s, many people could no longer earn their living in the countryside. People moved from farms and villages into bigger towns and cities to find work. Cities grew larger, but they were often dirty, crowded, and unhealthy.

Although the machines made the work easier in some ways, factory work created many problems for the workers. Machines increased production. This meant that products were cheaper to make and also cheaper to buy. Factory owners grew rich. Factory employees, however, did not earn much, and the work was often dangerous. Many worked 12 to 14 hours a day. Men, women, and even small children worked in factories.

Workers sought to win improved conditions and wages through labor unions. These organizations helped create laws

that protected the workers. They limited the number of hours they had to work and guaranteed that they would be paid a certain amount.

► More to explore

Industry • Technology and Invention

Industry

An industry is a group of businesses that make or sell similar products or perform similar services. Farms are part of the agricultural industry. Factories are part of manufacturing industries. Schools are part of the educational services industry. Industries are important to every country's economy.

The first human industry was agriculture. Most developing countries still depend on agriculture as their main industry.

Another early industry was mining, or the removal of metals and other materials from the earth. Since prehistoric



Manufacturing plants produce many different kinds of products, including foods and beverages.

times humans have mined metals to make tools and other goods.

Manufacturing industries make goods from the raw materials produced by agriculture and mining. Manufacturers make such everyday items as clothing, cars, computers, paper, and processed food. Another manufacturing industry is construction. Construction workers build houses, office buildings, roads, bridges, and sewers.

Service industries dominate the economies of developed countries. Workers in service industries do not provide actual goods. Instead they perform actions. Teachers, car mechanics, barbers, house-painters, bankers, and actors are all in service industries. One of the most important service industries is telecommunications. By connecting telephones and computers, telecommunications allows people to talk across great distances.

► More to explore

- Agriculture • Economics
- Manufacturing • Mining
- Telecommunication

Indus Valley Civilization

One of the first civilizations in the world developed in the valley of the Indus River in Asia. It occupied both sides of what is now the border between Pakistan and India. The Indus Valley civilization lasted from about 2500 BC to about 1700 BC.



Society and Culture

The biggest cities of the Indus Valley civilization were Harappa and Mohenjo-daro. Both were in what is now Pakistan. Harappa might have had as many as 35,000 people. Mohenjo-daro was even larger. There were also at least 60 smaller settlements along the Indus River and the Arabian Sea.

Farming was important to the Indus Valley civilization. People ran water channels from rivers to the fields. The Indus people were among the first to grow cotton and use it to make cloth. They also might have been the first people to raise chickens.

Indus merchants used carved stones called seals to mark their goods. Many seals show pictures of animals and a form of writing. These seals have been found in Mesopotamia (in what is now



The people of the Indus Valley carved many objects, including mazes and dice.



A seal often had animal pictures and writing carved into it.

Iraq). This means that the two regions might have traded with each other.

History

Beginning in about 5000 BC, farmers near what is now Iran began to gather in villages. In about 3500 BC settlers began to move eastward into the Indus Valley. By about 2500 BC the Indus Valley civilization had developed at Harappa and other sites. Scholars do not know much about Indus Valley history because they do not understand the writing system.

The Indus Valley civilization probably broke down in stages between 2000 BC and 1700 BC. Some historians blame invaders from the west, probably a group known as Aryans. Climate change, floods, and diseases also might have hurt the civilization.

► **More to explore**
Civilization • Indus River

Influenza

Influenza, or flu, is a common illness of the respiratory, or breathing, system. Germs called viruses cause influenza. The viruses invade the nose, throat, and lungs.

The signs of influenza come on suddenly. They include body aches, chills, and fever. The person also may cough and sneeze and have a sore throat.

People with influenza often become very tired. Some may have a headache. After three or four days most people start to get better. But flu can be a serious danger to people who are very old or very young or have other health problems. Such people can get pneumonia and bronchitis.

Influenza viruses come in many types. The most dangerous types can kill even young and healthy people. Luckily, they do not cause outbreaks very often. But in 1918–19 an outbreak of influenza



Temporary hospitals took in many influenza patients during the 1918–19 outbreak.

killed more than 20 million people throughout the world.

People with influenza should get plenty of rest and drink lots of fluids. In the late 20th century scientists developed medicines to treat influenza.

People can protect themselves from influenza viruses by getting a shot of a substance called a vaccine. Because the viruses change constantly, a person must get a vaccination every year to stay protected.

► More to explore

Pneumonia • Respiratory System
• Vaccine • Virus

Inquisition

In the 1200s the Roman Catholic church set up a court called the Inquisition. The Inquisition examined people accused of heresy, or going against church teachings.

The officials in charge of the Inquisition were called inquisitors. Inquisitors first gave an accused person a chance to confess. Some inquisitors tortured people to get them to confess. Even innocent people often confessed under torture.

People who did not confess received trials. Then inquisitors announced punishments for the guilty in a big ceremony. Punishments included fines, prison, or death.

Pope Gregory IX started the Inquisition in 1231. The Inquisition operated in



A painting shows inquisitors questioning a man. Inquisitors punished people who went against the teachings of the Roman Catholic church.

several countries. It was particularly harsh in Spain in the late 1400s, under King Ferdinand and Queen Isabella. A Spanish inquisitor named Tomás de Torquemada burned about 2,000 people at the stake. Torquemada also persuaded Ferdinand and Isabella to force more than 160,000 Jews out of Spain.

The Inquisition had some famous victims. One of them was the French heroine Joan of Arc. She was burned at the stake in 1431 partly because she claimed that she had received messages directly from God. Another was the Italian scientist Galileo. In the early 1600s he was punished for teaching that Earth revolves around the sun. Galileo was not put in prison, but he was not allowed to travel freely outside his house either. The Inquisition continued in a milder form until 1908.

► More to explore

Ferdinand and Isabella • Galileo
• Roman Catholicism

Insect

The insects are the largest group of animals. In fact, about 75 percent of all animals are insects. Insects developed on Earth long before humans did. Today there are about 1 million known species, or types, of insect. And scientists are constantly discovering new species. Butterflies, beetles, ants, flies, grasshoppers, silverfish, and bees are all insects.

Where Insects Live

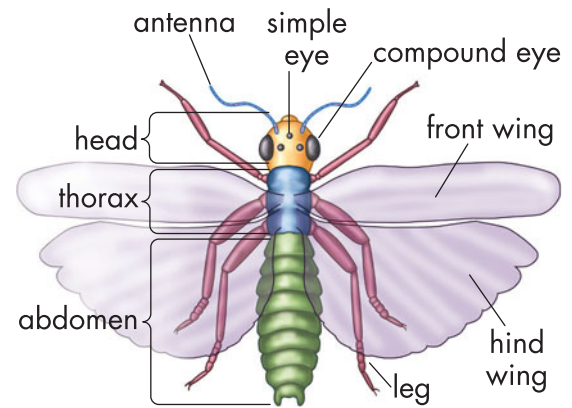
Insects live all over the world. They can survive in almost any place where food is available. For instance, insects can be found in cold regions, hot rain forests, deserts, mountains, caves, and freshwater. A few kinds even live in salt water.

Physical Features

Insects are members of a larger group called the arthropods. This group also includes spiders, ticks, centipedes, lobsters, and crabs. Like all arthropods, insects have a body that is divided into segments, or sections. They also lack a skeleton inside the body. Instead, insects



Honeybees are well-known insects. They build honeycombs to store their honey.



The body of an insect has three main segments: the head, the thorax, and the abdomen. The legs and the wings are connected to the thorax.

and other arthropods have a covering on the outside of the body called an exoskeleton. This exoskeleton protects the insect's body.

Unlike other arthropods, insects have three major body segments. Insects also have six legs. This is one way that insects differ from spiders, which have eight legs. Insects also have at least one pair of antennae, or feelers.

The three major segments of an insect body are the head, the thorax, and the abdomen. The head contains the insect's antennae, mouthparts, and eyes. The adults of many species have two kinds of eyes, simple and compound. Compound eyes have many lenslike parts. Each of these receives a separate image. The images are combined into a single picture in the insect's brain.

The thorax has three pairs of legs and usually two pairs of wings. But some insects have only one pair of wings or no wings at all.

The abdomen is made up of as many as 11 segments. It contains organs that digest food, push out wastes, and help the insect reproduce.

Insects vary greatly in size. Most insects are small, usually less than 0.2 inch (6 millimeters) long. However, some insects called walkingsticks can grow to more than 12 inches (30 centimeters) in length.

Behavior

Insects have a variety of ways to protect themselves from their enemies. For example, some insects hide by blending in to their surroundings. Many moths have a similar coloring to the bark of the trees on which they rest. Beetles have a very hard body armor to protect them. Some insects bite or sting their enemies. Some kinds produce poison.

Some kinds of insects live alone, while others live in groups. Termites, ants, and some bees and wasps live in very organized groups. Each individual has a particular job to do for the group. For example, some termites are born to be soldiers or workers. Other termites will be the king and queen.

Insects eat a great variety of plants, animals, and other living things. Certain insects, such as fleas and lice, live on the body of another animal. They get all their food from that animal's body. Such insects are called parasites.

Life Cycle

Most insects hatch from eggs. A few kinds are born live. An insect's exoskel-



As an insect grows, it sheds its exoskeleton from time to time. The insect then forms a new, larger exoskeleton.

eton cannot grow. Instead, as the insect grows, this covering splits apart and falls off from time to time. The insect grows a new covering. This process is called molting.

There are two basic life cycles found in insects. Some insects are born in nearly the same form they will have as an adult. The insect grows and molts, eventually becoming an adult. Grasshoppers and cockroaches go through this kind of growth process.

Other types undergo a complete change, or metamorphosis. After they hatch, they begin life in a form called a larva. It is completely unlike the adult form. For instance, a larva may look more like a worm than an insect. The larva eats a great deal and molts several times. It then enters a resting stage in a form

Did You Know?

Scientists who study insects are called entomologists.

called a pupa. The pupa's body changes greatly during this stage. It develops all of the features of the adult, including wings and legs. When this stage is complete, the adult emerges from the pupa. Bees, butterflies, and moths are some insects that develop this way.

Helpful and Harmful Insects

Many insects are helpful to humans and other animals. Some kinds eat other insects that are pests. Insects are also food for other animals. Some insects produce valuable products such as honey, silk, and dyes.

Many flowering plants depend on insects such as bees to help them reproduce. As insects feed on flowers, they spread a substance called pollen from the male parts of flowers to the female parts. This allows the female parts to make seeds.

Insects can also be pests. Some insects sting or bite people or other animals. Many insects can spread diseases to people, other animals, and plants. And some harmful insects eat crops, wood, clothing, and carpet.

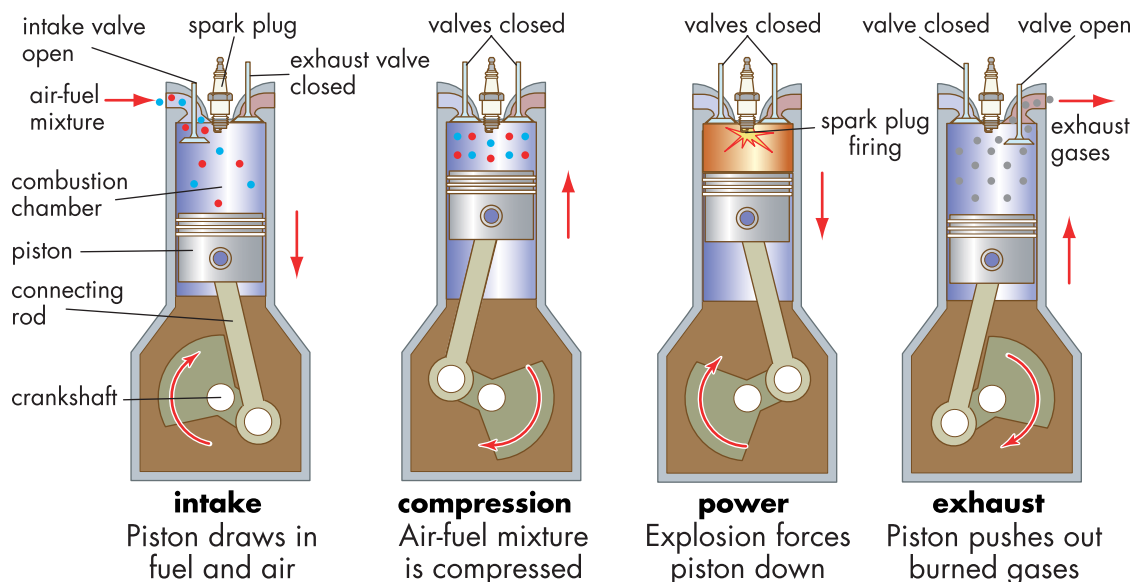
► More to explore

Animal • Metamorphosis • Parasite
• Pollen • Protective Coloration

Internal-Combustion Engine

Engines powered by internal combustion run cars, airplanes, lawn mowers, and other machines. Combustion means “burning.” Fuel, usually gasoline, burns inside an internal-combustion engine to make it work. Compared to earlier steam engines, internal-combustion

Four-Stroke Cycle



An internal-combustion engine goes through four strokes: intake, compression, combustion (power), and exhaust. As the piston moves during each stroke, it turns the crankshaft.

engines are lighter and more powerful. They made automobiles possible.

How Internal-Combustion Engines Work

In many internal-combustion engines a moving part called a piston slides up and down in a cylinder. Most car engines have four to eight cylinders. Valves at the top of a cylinder let in fuel and air and allow burned fuel to escape. Also at the top of the cylinder is a spark plug. The spark plug ignites, or sets fire to, the fuel.

As the engine runs, it goes through a cycle of four strokes: intake, compression, combustion, and exhaust. During the intake stroke, a valve opens and the cylinder fills with fresh fuel and air. Next, during the compression stroke, the piston moves toward the top of the cylinder. The piston creates pressure by squeezing the fuel and air into a smaller and smaller space with both valves closed. When the piston can go no higher, a spark from the spark plug ignites the fuel. Then, in the combustion stroke (also called the power stroke), an explosion of burning fuel forces the piston back down. During the exhaust stroke, a second valve opens and the piston rises up. It pushes the hot gases from the burned fuel out of the cylinder.

The piston is connected to an engine part called the crankshaft, which is outside of the cylinder. As the piston moves, it turns the crankshaft. The crankshaft is connected to other parts that run the machine.

Other types of internal-combustion engines are two-stroke, diesel, rotary, and turbine. Two-stroke engines go through two strokes instead of four. In diesel engines hot air, not a spark, causes the fuel to burn. Rotary engines have a spinning part instead of a piston. Turbine engines, used in jet airplanes, continually pull air into the front of the engine. The exhaust leaves out the back of the engine.

Although internal-combustion engines are powerful, most of the energy from the burning fuel is lost as heat. The engines must be cooled by water or air so they do not overheat.

History

In 1860 the French inventor Étienne Lenoir built the first internal-combustion engine, which he used in a car. In 1876 the German engineer Nikolaus Otto built a four-stroke engine. Otto's invention was the first successful internal-combustion engine. Rudolf Diesel, another German engineer, developed the diesel engine in about 1890.

► More to explore

Airplane • Automobile • Combustion

Internet

The Internet is a network, or system, that connects millions of computers worldwide. It was one of the greatest inventions of the 1900s. Today the Internet helps many people communicate, work, learn, and have fun.

Did You Know?

Two-stroke engines are popular for lawn mowers and small motorcycle engines.

In the 1960s the U.S. government, businesses, and colleges worked together to make a system that would let computers across the United States share information. They created an early form of the Internet called ARPANET in 1969. In 1971 electronic mail, or e-mail, was invented as a way to send a message from one computer to another.

By the mid-1970s many groups of computers were connected in networks. Machines called routers were invented to connect the networks. This is how the original ARPANET eventually grew into the Internet.

In 1989 hypertext was invented. Hypertext is a link between different parts of an electronic document or between different documents. Hypertext became the basis of the World Wide Web, or “the Web,” which was created in the early 1990s.

Information on the Web is arranged in sites or pages. People view Web sites



A family uses a computer with a camera attached to it. The camera can take pictures that can be sent over the Internet to other family and friends far away.

using computer programs called Internet browsers. People create Web sites using a code called hypertext markup language, or HTML. Browsers read HTML and allow people to view Web sites on the computer. Each Web site has its own Internet address, called a uniform resource locator, or URL.

Since its beginnings, the Internet has changed to keep up with the demands of its users. Advances in technology make using the Internet quicker and easier. And as more and more people use the Internet, the quantity of information grows.

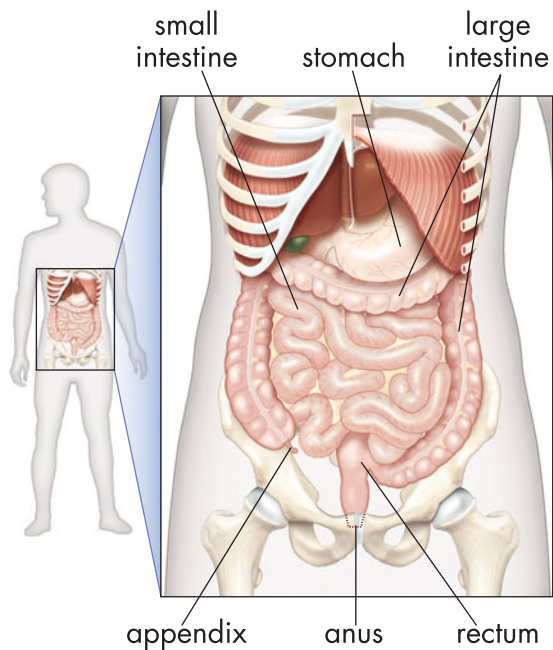
► More to explore

Computer • Technology and Invention

Intestines

Intestines are organs, or body parts, that are shaped like long tubes. They help break down food so that the body can use it for energy. This is part of the process called digestion. The intestines also remove wastes from the body. Mammals, birds, reptiles, amphibians, and fish have intestines.

A human's intestines fill much of the middle part of the body below the rib cage. The intestines are divided into two main sections, the small intestine and the large intestine. The small intestine is 22 to 25 feet (6.7 to 7.6 meters) long and coils like a maze. The large intestine is 5 to 6 feet (1.5 to 2 meters) long. The intestines have a special kind of muscle that squeezes and relaxes in a wavelike



In humans, the small intestine is longer and narrower than the large intestine.

motion. This motion pushes food and waste through the intestines.

The Small Intestine

Food enters the small intestine after it leaves the stomach. At this time the food is in the form of a thick liquid. Digestive juices from other organs, including the pancreas and the liver, enter the small intestine. They work with juices from the small intestine to break down the food into simple chemical substances. These substances then pass into the bloodstream through the walls of the small intestine. This process takes three to six hours.

The Large Intestine

Any food material that cannot be used by the body passes from the small intestine into the large intestine. The large intestine takes water and some minerals from this leftover food material. Tiny

living things called bacteria in the large intestine help to turn the food material into feces, or solid waste. The feces are stored in the large intestine until they pass from the body. The work of the large intestine takes between 10 and 20 hours.

► More to explore

Digestive System • Stomach

Inuit

► see Eskimo.

Invention

► see Technology and Invention.

Invertebrate

An invertebrate is an animal without a backbone. (An animal with a backbone is called a vertebrate.) Invertebrates live in every part of the world. In fact, most of the animals on Earth are invertebrates.

Invertebrates come in all different shapes and sizes. Some are so tiny that they can be seen only through a microscope. But the giant squid is an invertebrate, and it can grow to a length of 65 feet (20 meters).

The simplest animals are invertebrates. These include protozoans with just one cell as well as sponges and other simple animals that live in the water.

The invertebrate animals can be grouped according to their features. Many of them, such as worms, have soft bodies. Corals, jellyfish, and sea anemones are invertebrates that have stinging tentacles. Mollusks have soft bodies as well, but most also have a thick outside shell. Oysters and snails are mollusks. Squid and octopuses are also mollusks even though they do not have shells.

Some invertebrates have a tough, spiny skin that protects their bodies. These invertebrates are called echinoderms. Starfish and sea urchins are examples of echinoderms.

Other invertebrates have a hard outside covering on their bodies called an exoskeleton. These invertebrates are called arthropods. Arthropods include insects, spiders, centipedes, millipedes, and crustaceans such as lobsters and crabs.

► More to explore

Vertebrate

Iowa

The Native Americans known as the Iowa (or Ioway) once lived near the Great Lakes. By the 1700s, however, they had moved to what is now the state of Iowa. The state was named after the tribe.

The Iowa lived in villages of dome-shaped houses covered with earth. They grew corn, beans, and squash. They also hunted bison (buffalo) and deer. After getting horses in the 1700s the Iowa covered greater distances while hunting



Shauhaunapotinia was a chief of the Iowa people.

on the Great Plains. On the hunt they lived in tepees covered with bison hides.

French traders began visiting Iowa villages in about 1700. They carried a disease called smallpox that killed many Iowa. U.S. explorers led by Meriwether Lewis and William Clark passed through Iowa territory in the early 1800s. Many settlers followed.

In 1836 the U.S. government forced the Iowa to move to a reservation in what are now Kansas and Nebraska. Later in the 1800s the United States tried to move the Iowa to Indian Territory (now Oklahoma). Not all the Iowa moved. The tribe separated into two groups now known as the Iowa Tribe of Oklahoma and the Iowa Tribe of Kansas and Nebraska. At the end of the 20th century there were about 1,500 Iowa.

► More to explore

Native Americans

Iowa



The skyline of downtown Des Moines provides a modern backdrop to the Iowa state Capitol.

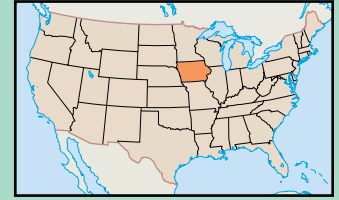
The U.S. state of Iowa is one of the most productive agricultural areas in the United States. It is sometimes called the Tall Corn State because that crop grows well there. Iowa's official nickname, however, is the Hawkeye State, in honor of a Native American leader named Black Hawk. The state was named for the Iowa (or Ioway) Indians who once lived in the area. The state capital is Des Moines.

Geography

Iowa lies in the north-central part of the United States. The state is located between the Mississippi River in the east and the Missouri River in the west.

Iowa is bordered by Minnesota on the north, Wisconsin and Illinois on the

east, Missouri on the south, and Nebraska and South Dakota on the west. There are two chief breaks in the state's level sweep of land. Steep cliffs drop to the Mississippi River in the northeast. Low, moundlike bluffs rise above the prairies in the southwest. Summers are warm and humid. The winters are cold.



People

Whites of European heritage make up more than 90 percent of Iowa's population. Hispanics represent about 3 percent of the population and African Americans about 2 percent. Iowa is a checkerboard pattern of farms, towns, and cities. Most Iowans live in small communities. The state's largest cities are Des Moines, Cedar Rapids, and Davenport. The main public institutions of higher learning are the University of Iowa, at Iowa City; Iowa State University, at Ames; and the University of Northern Iowa, at Cedar Falls.



Facts About IOWA

Flag



Population

(2000 census)
2,926,324—
rank, 30th state;
(2008 estimate)
3,002,555—
rank, 30th state

Capital

Des Moines

Area

56,272 sq mi
(145,743 sq
km)—rank, 26th
state

Statehood

December 28,
1846

Motto

Our Liberties We
Prize and Our
Rights We Will
Maintain

State bird

Eastern goldfinch



State flower

Wild rose



Economy

With rich soils, mostly flat ground, and plenty of rainfall, Iowa is an almost perfect place to grow crops. About 90 percent of its land is used for agriculture. The state specializes in corn, soybeans, and livestock (especially hogs and cattle). Dairy production is a major industry in the northeast part of the state.

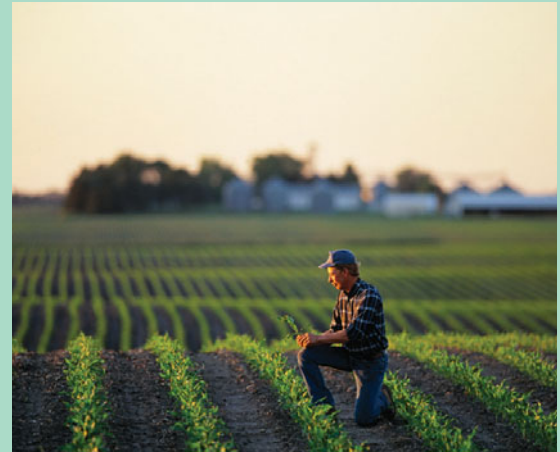
Despite the importance of agriculture in Iowa, the state's leading sources of income are manufacturing and services such as real estate, insurance, and health care. The most important manufacturing industries are the production of industrial machinery and the processing of food.

History

The earliest settlers in what is now Iowa were Native Americans. From about AD 300 to the 1600s eastern Iowa was inhabited by Native Americans who built great earth mounds, some in the shape of animals.

The French explorers Louis Jolliet and Jacques Marquette reached Iowa in 1673. They were probably the first Europeans to set foot in the area. No Europeans settled there permanently, however, until the early 1830s.

Iowa was part of the area called the Louisiana Purchase that the United States bought from the French in 1803. The territory of Iowa was formed in 1838. It entered the Union as the 29th state in 1846.



An Iowa farmer checks young corn plants for damage and disease. Corn is an important crop in Iowa.

The state was strongly against slavery and fought on the side of the Union during the American Civil War (1861–65). Shortly after the war Iowa became a center of the Grange movement. Granges were groups of farmers who came together to find ways to solve common problems.

Agriculture continues to be a central feature of Iowa. In 1959 a leader of the Soviet Union visited the state. In the spirit of cooperation created by the visit, Iowa began to export, or sell, some of its grain to that country. Since then Iowa has exported agricultural products to many overseas countries.

In 1988 Iowa farmers had problems due to heat and drought. The opposite took place in 1993 as too much rain caused the Mississippi River to flood many farms and cities.

► More to explore

American Civil War • Des Moines
• Iowa, people

Iran

Iran is a country of southwest Asia. For much of its history Iran was known as Persia to the outside world. However, the people of the region have called their country Iran for thousands of years. Iran means “land of the Aryans.” The Aryan people settled in the region in ancient times. Iran’s capital is Tehran.

Geography

Iran is part of the region called the Middle East. It shares borders with Iraq, Turkey, Armenia, Azerbaijan, Turkmenistan, Afghanistan, and Pakistan. Iran has coastlines on the Caspian Sea, the Persian Gulf, and the Gulf of Oman.

Iran’s land is high in elevation, except for narrow regions along the coasts. Mountain ranges surround a large central area of rocky highlands and deserts. Parts of the vast deserts are sandy, while a crust of salt covers other parts. The highest point in Iran is Mount Damavand in the northern Elburz Mountains. It reaches a height of 18,606 feet (5,671 meters). Iran has active volcanoes, and damaging earthquakes often occur.

The temperatures in Iran vary from very hot to very cold, depending on location and season. Most of the country is dry, except for a region around the Caspian Sea.

Plants and Animals

Forests cover only a small part of Iran. The largest forests are in the rainy

Caspian Sea region. Oaks and other trees grow there and in the southwestern Zagros Mountains. In the dry interior the vegetation is shrubby and grassy. However, a few areas of the desert, called oases, get water from underground. Grape vines, oleanders, date palms, and mulberry trees grow in the oases.

Iran’s wildlife includes bears, wild boars, gazelles, wild asses, rabbits, and many kinds of rodents. Seagulls, ducks, and geese are common birds.

People

Many ethnic groups live in Iran. Persians make up the largest group. Azerbaijanis, Kurds, Lurs, and other peoples form smaller groups. The main language is Farsi, or Persian. Each of the ethnic groups has its own language as well. Most Iranians live in cities or towns.





TIMELINE

The Persians begin building a great empire.

about 550 BC

The Safavid dynasty takes power.

1502

Iran becomes an Islamic republic.

1979

Ali Khamenei becomes Iran's new religious leader.

1989

Arabs bring Islam to Iran.

AD 640

Reza Khan becomes shah of Iran.

1925

The Iran-Iraq War begins.

1980

About 90 percent of the people belong to the Shi'ah branch of Islam, which is the state religion. (In most Muslim countries, Sunnah is the more common branch of Islam.) A small percentage of Iranians practice Zoroastrianism, the religion of ancient Persia.

Economy

Iran is one of the world's leading producers of petroleum (oil). Iran also produces natural gas, chemicals, metals, food products, cloth, and machinery. Iran has been famous for its carpets for hundreds of years. Traditional carpets are still an important export. Services—including government work, banking, and tourism—are also important to the economy.

Iran's crops include grains, sugar beets, and many kinds of fruits and nuts. Sheep are the main livestock. Commercial fisheries operate in the Persian Gulf and in the Caspian Sea.

History

The Aryan people came from central Asia to what is now Iran sometime after 2000 BC. The two main groups of Aryans were the Medes and the Persians. The Persians took control in about 550 BC. They conquered vast territories. The Persian Empire soon stretched from North Africa to the Indus River in south Asia. The European conqueror Alexander the Great held Persia for a time starting in about 330 BC.



A mosque with its welcoming courtyard stands in the city of Esfahan in western Iran.

Muslim Rule

Arab conquerors brought Islam to Iran in 640. For about 850 years non-Iranian Muslims ruled Iran. Then, in 1502, the Iranian Safavid dynasty took control.

A weaker dynasty, the Qajars, ruled from 1779 to the early 1900s. During the Qajars' rule Russia and Great Britain won control over parts of Iran.

The Pahlavi Dynasty

In 1921 Reza Khan, an army officer, seized control of the country. In 1925 he became shah, or king, and took the name Reza Shah Pahlavi. His reign started the Pahlavi dynasty. Reza Shah built modern schools and a railroad. He also gave Iranian women more rights.

Reza Shah's son, Mohammad Reza Shah Pahlavi, took the throne in 1941. The new shah continued to make Iran more modern. However, he also used secret police to stop those who disagreed with him.

Many religious leaders felt that the shah's ideas went against Islam. The government threw one of those leaders, Ayatollah Ruhollah Khomeini, out of the country in 1964.

From outside Iran, Khomeini led a revolution against the shah. Huge protests forced the shah to leave Iran in 1979.

The Islamic Republic

Khomeini then returned to Iran. He declared himself Iran's political and religious leader for life. He renamed the country the Islamic Republic of Iran.



A woman weaves a carpet on a large loom in Iran. Traditional carpets from Iran are known for their fine quality and design.

Khomeini's government enforced strict Muslim laws. It also banned Western (U.S. and European) influences.

In late 1979 supporters of the revolution seized the U.S. embassy (a building that belonged to the U.S. government) in Tehran. They captured 66 U.S. citizens and held them for more than a year.

In 1980 Iraq invaded Iran, and the Iran-Iraq War began. The war ended in 1988. More than a million people were killed or injured during the war. However, neither side won a clear victory.

Khomeini died in 1989. Iran then chose a new religious leader, Ali Khamenei. Khamenei continued the government's strict policies. He worked with the country's presidents. However, Khamenei and other religious leaders still controlled much of the government.

► More to explore

Iran-Iraq War • Islam • Middle East
• Persia • Tehran

Facts About IRAN



Population
(2008 estimate)
72,269,000

Area
636,374 sq mi
(1,648,200 sq km)

Capital
Tehran

Form of government
Islamic republic

Major cities
Tehran, Mashhad, Esfahan, Tabriz, Shiraz

Iran-Iraq War

Differences between the neighboring countries of Iran and Iraq led to war in 1980. The fighting lasted for eight years. The Iran-Iraq War brought terrible destruction to both countries but ended with no clear winner.

Background

In 1979 there was a revolution in Iran. A strict religious leader named Ayatollah Ruhollah Khomeini came to power. Saddam Hussein, the leader of Iraq, did not want the revolution to spread to his country. He was also angry at Iran for supporting the Kurds, a minority group, in a rebellion against Iraq.

Iran and Iraq had disagreed for years over an oil-producing area on their border. Saddam Hussein wanted to take control of the region, which is in south-



An Iraqi soldier crouches behind cover during the Iran-Iraq War.

western Iran. He used this land dispute as an excuse to start a war.

Events of the War

Iraq invaded Iran by surprise in September 1980. Iraq won a few early victories. However, Iran did not give up as Saddam Hussein had expected. By mid-1982 Iran had won back almost all the land that Iraq had taken. Then Iranian forces pushed into Iraq.

For the next five years the two sides were evenly matched. Both suffered heavy losses. Iran and Iraq bombed each other's cities, oil fields, and tanker ships, which were used for shipping oil. Iraq got help from many countries, including the Soviet Union, Great Britain, and the United States.

Neither country obeyed the usual rules of war. Iraq used many chemical weapons. That had not been done by any country since World War I (1914–18). Iran cleared minefields by forcing young village boys to walk through them.

In 1987 Iraq started winning the war. In 1988 Iran accepted an agreement to end the fighting. At least 1 million people were killed or injured.

Peace talks continued until 1990. The countries agreed to share control of a river on their border. Iraqi troops left Iran in 1991. The last prisoners of war were exchanged in 2003.

► More to explore

Iran • Iraq

Iraq



The minaret, or tower, of a mosque in Samarra, Iraq, spirals to a height of about 170 feet (52 meters).

The country of Iraq covers the ancient region of Mesopotamia, a Greek word meaning “land between the rivers.” Those ancient rivers, the Tigris and the Euphrates, still run through Iraq. Today Iraq is one of the world’s leading oil producers. Baghdad is the capital and largest city.

Geography

Iraq is located in Southwest Asia in the region known as the Middle East. It borders Turkey, Iran, Kuwait, Saudi Arabia, Jordan, and Syria. Iraq has a short coastline on the Persian Gulf.

The central and southeastern parts of the country are plains with many lakes. Marshy lowlands surround the area where the Tigris and Euphrates rivers

meet, near the Persian Gulf. North of the plains, between the rivers, is a dry area known as Al-Jazirah. Western and southern Iraq is a vast desert. Highlands in the northeast include the mountainous region known as Kurdistan.

The plains and deserts have very hot summers and mild winters. Those regions receive little rainfall. The northeast is cooler and wetter, especially in the mountains.

Plants and Animals

Iraq has many date trees but very few forests. Willows, poplars, and licorice plants grow along the Tigris and Euphrates rivers. Reeds and tall grasses cover the marshlands. There are few plants in the deserts or on the dry plains.

The wild animals of Iraq include hyenas, pigs, jackals, foxes, and rabbits. Among the many varieties of birds are ducks,



partridges, snipes, and herons. People raise water buffalo in the marshlands.

People

Arabs make up the majority of Iraq's population. They speak Arabic, which is the country's main language. The Kurds form the next-largest group. They speak Kurdish and live mainly in the north and northeast. Almost all Iraqis are Muslims.

Most Iraqis live in cities and towns, where they lead modern lifestyles. Many rural Iraqis farm the land or raise livestock.

Economy

Wars in the late 20th and early 21st centuries badly hurt Iraq's economy. However, oil still provides almost all of Iraq's earnings from trade. Iraq also produces oil products, chemicals, construction materials, and processed foods. It imports food, medicine, and other goods.

Farming is another important part of the economy. Crops include wheat, dates, potatoes, tomatoes, barley, watermelons, oranges, grapes, and cucumbers. Iraqis also raise sheep and cattle.

History

Iraq's history reaches back thousands of years. In about 3300 BC the Sumerians created one of the world's first civilizations in Mesopotamia. People from Babylonia, Assyria, Persia, Macedonia, and other nearby areas later ruled the region.

Arab and Ottoman Rule

Muslims from Arabia conquered the area in the AD 600s. For a time Baghdad was the center of the Muslim world. Many of the greatest Muslim philosophers, poets, and writers lived there. In 1258 a group called the Mongols conquered the city. Iraq then became a land of small kingdoms. The Ottoman Turks took control in the 1500s. Iraq remained



TIMELINE

Muslim Arabs
conquer Iraq.

638

Great Britain
occupies Iraq.

1918

Iraq invades
Iran.

1980

U.S.-led forces
invade Iraq.

2003

The Ottoman
Empire takes
control of
Baghdad.

Iraq gains
independence.

Foreign troops
defeat Iraq in
the Persian
Gulf War.

part of the Ottoman Empire until the 20th century.

The Republic of Iraq

During World War I (1914–18) British troops occupied Baghdad and ended Ottoman rule. After the war Iraq remained under British protection. In 1921 Iraq became a monarchy. The country achieved full independence in 1932. A revolution led by a group of army officers ended the monarchy in 1958. Iraq then became a republic.

In the 1960s and 1970s the Iraqi government faced a rebellion by the Kurds. The rebels wanted self-government. Iran provided military aid to the Kurds, which strained relations between Iraq and Iran. The Kurdish rebellion collapsed in 1975, but occasional fighting continued into the 21st century.

The Iran-Iraq and Persian Gulf Wars

Saddam Hussein became Iraq's president in 1979. A year later Iraq invaded Iran. The resulting Iran-Iraq war lasted until 1988. Neither side won a clear victory.

In 1990 Saddam ordered Iraqi troops to invade the neighboring country of Kuwait. Iraq claimed that Kuwait had been part of its territory since 1871. The invasion led to the Persian Gulf War of early 1991. In less than two months, a group of nations led by the United States pushed Iraq's forces out of Kuwait.



A rocket blasted a hole in an archway leading to the National Museum of Iraq in Baghdad during a war in 2003. The city suffered heavy damage during the war.

Ongoing Troubles

At the end of the Persian Gulf War, weapons inspectors from the United Nations entered Iraq. The inspectors wanted to make sure that Iraq destroyed some of its weapons and stopped making more. Iraq refused to cooperate with the inspectors.

The United States and Great Britain feared that Iraq was building illegal weapons. As a result, U.S. and British forces invaded the country in March 2003. The foreign troops soon took control of Iraq and captured Saddam. The foreign forces and Iraqi leaders then worked to set up a new government in Iraq. However, some Iraqis continued to fight the foreign troops and the new Iraqi leaders. Violence also broke out between followers of the Sunnah and Shi'ah branches of Islam.

► More to explore

Baghdad • Mesopotamia • Persian Gulf War • Saddam Hussein

Facts About IRAQ



Population
(2008 estimate)
29,492,000

Area
167,618 sq mi
(434,128 sq km)

Capital
Baghdad

Form of government
Transitional government

Major cities
Baghdad, Mosul, Al-Basrah, Irbil, Kirkuk



Ireland

Known as the Emerald Isle, Ireland is famous for its green countryside. Throughout much of its history, Ireland fought against rule by Great Britain. Most of the island gained independence in the 1920s. However, Britain continued to control a section called Northern Ireland. In the 1990s the independent republic of Ireland became a successful member of the European Union. The capital is Dublin.

Geography

The Republic of Ireland occupies most of the island of Ireland. Its neighbor, Northern Ireland, occupies one sixth of the island. The island lies off the western coast of Great Britain, from which it is separated by the Irish Sea. The Atlantic Ocean borders western Ireland.

A low-lying plain spans most of eastern and central Ireland. Hills and low mountains rise mainly in the west.

Carrantuohill, at 3,414 feet (1,041 meters), is the highest point in the country. The most famous of Ireland's rivers is the Shannon. The country has mild summers and cool winters with plenty of rain.

Plants and Animals

Grasslands, heather, and pastures cover most of the country. Mosses and lichens grow throughout the island. Ireland has few trees. Most of the original forests were cut down long ago for lumber and to clear the land for farming.

Ireland has a wide variety of birds and fish. Mammals include mice, hares, and stoats (animals similar to weasels). The only reptile in Ireland is a type of lizard. There are no snakes. According to legend, Saint Patrick chased all the snakes from the island, but it is unlikely that Ireland ever had any.

People

Most people in Ireland are ethnic Irish, whose main ancestors were the ancient Celts. English people form a small group. Students learn both Irish (also called Gaelic) and English in school, but the everyday language is English. Most Irish are Roman Catholics. About 40 percent of the people live in rural areas.

Beginning in the mid-1800s, large numbers of people left Ireland because of crop failures, a poor economy, and high unemployment. Today more Irish





Colorful houses line the street in the village of Eyeries in southern Ireland.

people live outside Ireland than inside the country.

Economy

Ireland's people relied on farming for their income for much of the 1900s. During the 1990s, however, the country enjoyed great economic growth. This was due in part to the development of a technology industry. Services, including finance, transportation, and public administration, are now Ireland's main economic activities. Tourism is one of the country's largest service industries.

Manufacturing, mining, and construction are also very important to the economy. Among Ireland's products are office equipment and computers, chemicals, medicines, alcoholic beverages, and clothing. Ireland has limited natural resources, including zinc, lead, and silver, as well as small reserves of natural gas and coal.

Agriculture is now a small part of the Irish economy. Crops include sugar beets, barley, wheat, and potatoes. Farm-

ers raise cattle for meat and milk, sheep for wool, and pigs for meat. Fishing is another source of food.

History

The first people to live in Ireland were hunters and fishers. They came from the European mainland in about 6000 BC. Later settlers brought knowledge of farming in about 3000 BC and skills in metalworking by about 2000 BC.

In about 300 BC invaders from Europe known as Celts overran Ireland. The Celts wiped out almost all the earlier inhabitants. They set up a number of kingdoms on the island.

In the AD 400s Saint Patrick helped to spread Christianity among the population of Ireland. Ireland remained peaceful until the late 700s, when Vikings invaded. The Irish finally defeated the Vikings in 1014.

English Rule

In 1170–71 English armies conquered large parts of Ireland. In the early 1600s



The Newgrange tomb in Ireland was built in about 3200 BC. Ancient peoples buried their dead inside the tomb.



TIMELINE

The Celts settle in Ireland.		England begins conquering Ireland.		The Irish potato famine begins.		The Irish Free State votes to become an independent republic.
before 300 BC	AD 795	1170	1641	1845	1921	1948
	The Vikings invade Ireland.		An Irish revolt against English rule fails.		Southern Ireland becomes the Irish Free State.	

Facts About IRELAND



Population
(2008 estimate)
4,467,000

Area
27,133 sq mi
(70,273 sq km)

Capital
Dublin

Form of government
Republic

Major cities
Dublin, Cork,
Galway, Limerick,
Waterford

England sent English and Scottish Protestants to settle in northern Ireland. Irish Catholics revolted against those settlers in 1641, but the English crushed the revolts. They also imposed strict anti-Catholic laws.

By the end of the 1600s England firmly controlled the island. In 1801 the Act of Union joined Great Britain (England, Scotland, and Wales) and Ireland together to form the United Kingdom.

Independence

The Irish strongly opposed British rule. Beginning in 1919 a group called the Irish Republican Army (IRA) fought the British Army for independence. In 1921 Britain agreed to make the southern part of the island the Irish Free State. Six counties in the north remained under direct British control, however. Those countries were renamed Northern Ireland. In 1937 the Irish Free State took the name Éire, or Ireland. Ireland

adopted a new constitution, though it kept some ties to Britain.

In 1949 Ireland became a fully independent republic. Britain and Ireland struggled over control of Northern Ireland until 1973. That year the government of Ireland acknowledged British rule in the north. But the IRA, now separate from the Irish government, continued to attack the British in the hope of reuniting Ireland. The Irish government helped work out a peace agreement between the two sides in 1998.

In 1993 Ireland became one of the original members of the European Union. At the start of the 21st century, Ireland welcomed growing numbers of immigrants for the first time in its modern history.

► More to explore

Celt • Dublin • European Union
• Northern Ireland • United Kingdom

Ireland, Northern

► see Northern Ireland.

Iris



The Siberian iris grows in central and eastern Europe. Its flowers may be violet-blue or white.

Irises are popular garden flowers. They are known for their wide variety of colors and their unique petal shapes. There are about 300 species, or types, of iris. They grow mostly in mild northern regions. Some of the most beautiful species are from central Asia and the area around the Mediterranean Sea.

Some irises grow from bulbs. Others grow from the rhizomes of other iris plants. Rhizomes are vinelike stems that spread out just beneath the surface of the soil. New plants grow from different points on a rhizome.

Irises have six petals. The three inner petals stand upright and are called standards. The three outer petals droop down and are called falls. The petals can be white, yellow, pink, red, blue, purple, brown, or even black.

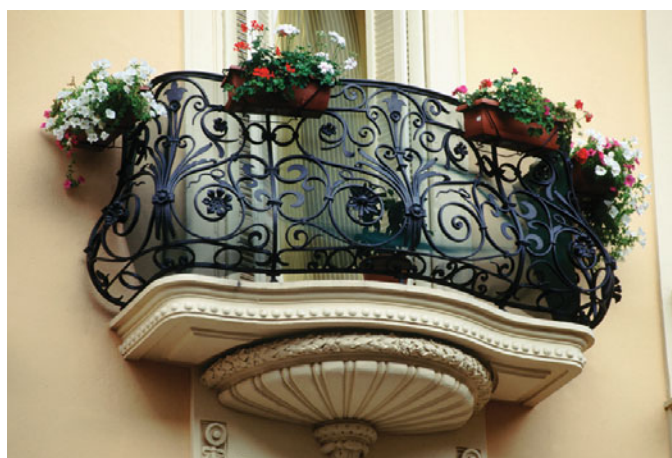
The best-known irises are the common garden irises. They are also called bearded irises. This is because each of the falls has a fuzzy growth that looks something like a beard. Bearded irises grow from rhizomes. They have stiff, swordlike leaves and long stems. They can grow to 3 feet (90 centimeters) tall. They usually have a strong fragrance.

► More to explore

Flower • Garden

Iron

Iron is the most widely used metal on Earth. Iron is used to make steel. In turn, steel is used to make buildings, bridges, railroad tracks, vehicles of all kinds, and countless other products.



People make some decorative railings out of iron.

Did You Know?

Iron pounded into a shape is called wrought iron. Iron poured into a mold is called cast iron.

Iron in Earth's Crust

Iron is the second most common metal in Earth's crust. Of the metals in the crust, only aluminum is more common. Iron is also the fourth most common element (basic substance) in the crust.

Iron in its pure form is a heavy, silvery, magnetic metal. But iron is almost never found in its pure form in nature. Instead, it is found in the form of iron ores. Ores are minerals with mixtures of different elements. The main iron ores are made up of iron linked to oxygen or to oxygen and carbon.

Separating and Using Iron

Workers separate pure iron from iron ore by a process called smelting. Smelting involves heating iron ore to a very high temperature. As the iron ore melts, the pure iron separates from the ore.

Hot lumps of iron may be pounded into shapes. Melted iron may be poured into molds of different shapes. As the iron cools, it hardens. Today, however, most iron is made into steel. Steel is a mixture of iron and carbon. Steel is stronger than iron alone.

Thousands of years ago people may have gotten iron from iron meteorites. Meteorites are chunks of rock that fall to Earth from outer space. After ancient peoples discovered how to smelt iron, they learned how to make iron tools and weapons. During a period called the Iron Age, the knowledge of how to use iron spread across Europe and Asia.

Iron in the Body

Iron is an important part of a person's diet. Good sources of iron are red meat, chicken, tuna, egg yolks, beans, whole grains, dried fruit, and leafy green vegetables. The body uses iron to build a substance called hemoglobin in the blood. Hemoglobin carries oxygen to all the cells in the body. The cells use the oxygen to release the energy they need to do their jobs.

► More to explore

Iron Age • Metal • Steel

Iron Age

The Iron Age was a time in early human history when people began to use tools and weapons made of iron. The Iron Age started and ended at different times in different places. The earliest Iron Age probably took place in the Middle East



People in eastern Europe made iron tools more than 2,400 years ago.

and southeastern Europe. It started there in about 1200 BC.

Background

The earliest human beings lived during the Stone Age. Stone Age peoples made tools and weapons of stone. Later they learned to make tools and weapons from copper and from bronze, which is a mixture of copper and tin. This time was known as the Bronze Age. The Iron Age started after people learned to remove iron from rock using a very hot fire. Iron was better than bronze for tools and weapons because it was harder and stronger.

Events of the Iron Age

The knowledge of how to get iron from rock and how to make iron tools spread quickly from the Middle East to Egypt and Greece. The Iron Age eventually spread as far as West Africa, northern Europe, India, and East Asia. Australia and the Americas did not have an Iron Age. European settlers brought iron-working to those places much later.

The use of iron brought important changes to people's lives. People used iron to make strong tools, which made farming easier. They also made iron swords and other weapons. Huge armies of soldiers soon carried iron weapons. These weapons made an army much harder to defeat. Armies traveled to other lands and took over places they liked. Kings and other rulers gained great power.

Other changes in technology also happened during the Iron Age. People built



A museum in Great Britain shows the type of house that people built in about 300 BC, during the British Iron Age. The house is made of wood, plant materials, and mud.

large forts and bridges. Pottery and weaving improved. Humans dug deep mines in the ground to find salt and other valuable minerals.

End of the Iron Age

The Iron Age came at the end of prehistory, or the time before humans used writing. (In some places people were already using early forms of writing when the Iron Age began.) The Iron Age ended as writing became widespread and as civilization grew more complex.

Still, iron was the most important metal until the 1800s. People had often mixed iron with other materials to make it stronger, but in the 1800s they learned easier ways to do this. As a result steel (a mixture of iron and carbon) became more widely used than iron alone.

► More to explore

Bronze Age • Iron • Prehistoric Life
• Stone Age

Iroquois

The Iroquois Confederacy was a powerful alliance, or group, of Native American tribes in the 1600s and 1700s. The five original Iroquois tribes were the Cayuga, the Mohawk, the Oneida, the Onondaga, and the Seneca. The Tuscarora joined later. The Iroquois lived mainly in what is now the U.S. state of New York. Many Iroquois still live in New York. Others live in Wisconsin or southern Canada.

The Iroquois traditionally lived in buildings called longhouses. They built longhouses by covering a wooden frame with tree bark. Each longhouse was large enough for several families. For food, the Iroquois planted fields of corn, beans, and squash. They also fished and hunted deer.

According to tradition, the Iroquois Confederacy was founded by a chief named Hiawatha in the late 1500s. French explorers arrived in Iroquois territory in the 1600s. The Iroquois fought the French and their Indian allies. They



The Iroquois made houses out of tree bark and carved canoes out of logs.

became allies and trading partners of the British, who were enemies of the French. With guns that they got in trade, the Iroquois drove enemy tribes out of their land.

The American Revolution (1775–83) split the confederacy. The Mohawk, the Seneca, the Onondaga, and the Cayuga remained loyal to the British. They were led by the Mohawk chief Joseph Brant. The Oneida and the Tuscarora helped the Americans.

After the war the Iroquois lost much of their New York land. The British gave Brant some land in Ontario, and many Iroquois moved there. At the end of the 20th century there were about 80,000 Iroquois.

► More to explore

Cayuga • Hiawatha • Mohawk • Oneida
• Onondaga • Seneca • Tuscarora

Irrigation

Irrigation is what farmers do when they add water to their fields. The water makes their crops grow. Irrigation takes the place of rainfall in dry regions. It can greatly increase farm production. However, irrigation can also cause problems with the environment.

Getting Water

Most water for irrigation comes from the ground or from a river. Farmers get water from the ground by digging a well. Then they lift or pump the water from the well.



Irrigation allows farmers to grow crops in dry areas such as the desert of Saudi Arabia.

Farmers may get water from a river by digging a channel, or path, from the riverbank. They also may collect river water by building a dam across the river. Water collects behind the dam in an artificial lake called a reservoir.

After getting water, farmers move it to the farm fields. They move it through canals or pipelines. Gravity moves the water if the fields lie lower than the water source. If the water source lies lower than the fields, then farmers use pumps to raise the water.

Applying Water

The next step in irrigation is to deliver the water to the plants in the fields. There are many ways to do this. They include surface, subsurface, and overhead irrigation.

Surface irrigation systems apply water directly onto the soil surface. One kind of surface irrigation is called flood irrigation. This method floods the growing plants with water. Rice is the main crop irrigated by flood irrigation.

A second kind of surface irrigation is called furrow irrigation. A furrow is a shallow ditch between two rows of growing plants. Water flows into the furrows and then soaks into the earth. Potatoes, sugar beets, cotton, and corn are often irrigated by furrow irrigation.

A third kind of surface irrigation is called drip, or trickle, irrigation. Pipes with holes in them drip water onto plants. This method is good for dry regions. Because the plants get so little water at one time they can use it right away. This way, no water is wasted.

Subsurface irrigation systems apply water beneath the soil's surface. Buried pipes with holes in them deliver water to the plants. This method is good for fruit plants and garden vegetables.

Overhead irrigation systems spray or sprinkle water over crops. Rotary sprinklers are a common form of overhead irrigation. They sprinkle water in a wide circle while moving slowly across a field.



Water flows through furrows in a field in Idaho.



An overhead sprinkler system waters the crops on a farm in France.

Not all irrigation water gets to the plants. Some evaporates into the air, sinks deep into the ground, or runs off along the ground. An irrigation system usually includes a drainage system—ditches or underground pipes—to remove excess water from the soil.

Environmental Issues

Irrigation can cause environmental problems. Irrigation water contains more salt than rainwater. Salt can build up in the soil and harm plants. Salt buildup has ruined farmland in India, Pakistan, and other countries.

Taking too much water to use for irrigation can cause water shortages in other places. Irrigation now takes more water than nature can replace from the ground in some areas. In central Asia, the rivers that flow into the Aral Sea are heavily used for irrigation. The sea (actually a salt lake) is getting smaller as a result.

History

Ancient farmers irrigated crops by channeling river water. The Egyptians first used Nile River water about 7,000 years ago. The people in Mesopotamia (what is now Iraq) used the Tigris and Euphrates rivers. The people of the ancient Indus Valley civilization used the Indus River. The ancient Chinese used the Huang He, or Yellow River.

Native Americans were using irrigation more than 2,000 years ago. The Inca of Peru developed an advanced farming civilization based on irrigation. In about AD 1200 the Hohokam Indians built irrigation systems in what is now the U.S. state of Arizona.

Since then more and more land has come under irrigation. In the 1900s the U.S. government built many large dams for irrigation purposes. In the early 21st century India, China, the United States, and Pakistan had more irrigated land than any other countries.

► More to explore

Agriculture • Water

Isabella

► see Ferdinand and Isabella.

Isis and Osiris

Isis and Osiris were among the most important gods in ancient Egyptian mythology. Osiris was the god of the dead. He was also the god of crops and plentiful growth. Isis was his wife and



The ancient Egyptians worshipped many gods. Isis (right) and Osiris were two of the most important gods.

sister. She was a mother goddess believed to have great magical powers. Isis and Osiris had a son named Horus. The

Egyptians considered Isis and Horus to be the perfect mother and child.

According to legend, Osiris and Isis had a brother named Seth (or Set). Seth was a god of violence and disorder. He tricked Osiris into climbing into a wooden box. When Osiris climbed in, Seth slammed the lid shut. He threw the box into the Nile River, sending Osiris to his death.

Stories tell that Isis mourned her husband's death deeply. She recovered Osiris' body and buried him. Isis then used her great magic to give new life to Osiris. From then on, he was considered the ruler of the land of the dead, or underworld. Osiris was said to grant people life after death in the underworld.

► More to explore

Egypt, Ancient • Mythology

Islam

Islam is one of the world's major religions. Its founder was Muhammad. Islam has about 1.3 billion followers worldwide. Most of the followers of Islam, called Muslims, live in North Africa, the Middle East, and southern and central Asia.

Beliefs

At the core of Islam is this idea: "There is no God but Allah, and Muhammad is the prophet of Allah." Muslims believe that Allah created the universe and that humans must submit to his will. The content of the Koran, the

Did You Know?

Muslims consider Adam, Noah, Abraham, Moses, and Jesus to be prophets.



Muslims pray at a mosque in India.

holy book of Islam, is believed by Muslims to be the word of Allah as told to Muhammad.

Practices

Five duties, called the five pillars of Islam, are expected of every Muslim. The first is the most important: to profess that there is one God and that Muhammad was his prophet. The second duty is prayer. Muslims pray five times a day. On Fridays communities gather at a place of worship, called a mosque, for special prayers. The third duty is charity. The fourth duty is to fast, or refuse to eat, from sunrise to sunset during the holy month of Ramadan. The fifth duty is to make a

pilgrimage, or journey, to the holy city of Mecca in Saudi Arabia at least once.

Divisions

There are two major branches of Islam. Most Muslims belong to the Sunnah branch. They are called Sunnites. Sunnites are known as traditional Muslims. They follow the sayings of Muhammad and emphasize community.

Members of the smaller Shi'ah branch are called Shi'ites. They believe that the truths of the Koran are revealed only through a community leader called the imam. Interpretations by other people are not accepted. For this reason Shi'ites are not as open to other views as Sunnites are.

History

Muhammad

According to Muslims, in 610 an angel told Muhammad that Allah had chosen him as a prophet. Throughout his life, Muhammad continued to receive messages that he believed came from God.

The idea that there is only one God was unusual for Arabs at the time. Many people in Muhammad's hometown of

Some Important Islamic Holidays		
Holiday	Meaning	Date
Ramadan	a month of fasting, or not eating, during daylight hours	ninth month of the Islamic calendar
‘Id al-Fitr	celebration of the end of Ramadan	first three days of the 10th month of the Islamic calendar
‘Id al-Adha	end of the time of the hajj, or the journey to Mecca	begins on the 10th day of the last month of the Islamic calendar and lasts for four days
Note: The Islamic calendar is based on the Moon, so the holidays may occur in different seasons.		

Mecca disliked the new religion because of that belief. To avoid their hostility, Muhammad encouraged his followers to move to the nearby city of Medina. Muhammad's journey to Medina ended on September 24, 622, which is considered the starting point of Islamic history.

Division and Spread of Islam

Muhammad eventually persuaded most of the people of Arabia (including Mecca) to practice Islam. But after his death in 632, Muslims disagreed as to who should lead them. Muhammad's son-in-law 'Ali became the Muslim leader, or caliph, in 656. But he was murdered in 661. Some Muslims maintained that Muslim leadership belonged to 'Ali's descendants alone. They formed the Shi'ah branch of Islam. The Muslims who disputed this claim became the Sunnites.

During the 600s and 700s, Islam spread far beyond Arabia, from the western Mediterranean region to central Asia. Holy wars called jihads were fought to gain political control over societies so that they could be run using Islamic principles.

In the 11th century the Turks began their rise as an Islamic power. The Seljuk Turks conquered vast territories in the Middle East. In 1071 they captured Jerusalem. The Seljuks refused to allow Christians to visit holy sites in the land they controlled. Over the next two centuries, Muslim powers fought off Christian attempts to win back the Holy Land in a series of wars known as the Crusades. In the 1200s another group of

Muslim Turks, the Ottomans, began an empire. The Ottomans eventually ruled over North Africa, the Middle East, and southeastern Europe for hundreds of years.

Islam in Modern Times

During the 1800s and 1900s Western powers established colonies in Muslim nations for the purpose of trade. Islamic leaders lost political power. However, Muslims drew together more as a community in the face of colonization. In the 1900s this sense of unity helped many Muslim countries in their struggles for political independence.

In the late 1900s Islam became one of the fastest-growing world religions. Some Muslims have resisted the influence of the West, which they view as leading to a loss of traditional Muslim values. In Iran a revolution brought Islamic religious



Many Muslim women and girls wear head scarves.

leaders to power in 1979. Islam has had a strong influence on the governments of other countries as well.

► More to explore

Arabs • Caliphate • Crusades
 • Jerusalem • Koran • Mecca • Middle East • Mosque • Muhammad
 • Ottoman Empire • Pilgrimage
 • Ramadan

Islamabad



Population
 (1998 estimate)
 529,180

Islamabad is the capital of Pakistan, a country in southern Asia. Meadows, low mountains, and hilly plains surround the city. Its name means “City of Islam” or “City of Peace.”

Islamabad is a carefully planned city. It was built during the 1960s to be the new capital of Pakistan. Some of the buildings in Islamabad were designed using traditional Islamic styles. The city has wide, straight streets and many gardens and parks. The University of Islamabad and the Open University are located in Islamabad.

The city of Karachi was Pakistan’s first capital. Islamabad became the capital in 1969. Pakistan and India fought a war



The Grand National Mosque in Islamabad stands in front of the Margalla Hills, which are part of the Himalayas.

in 1971. The war slowed the city’s development for a time.

► More to explore

Pakistan

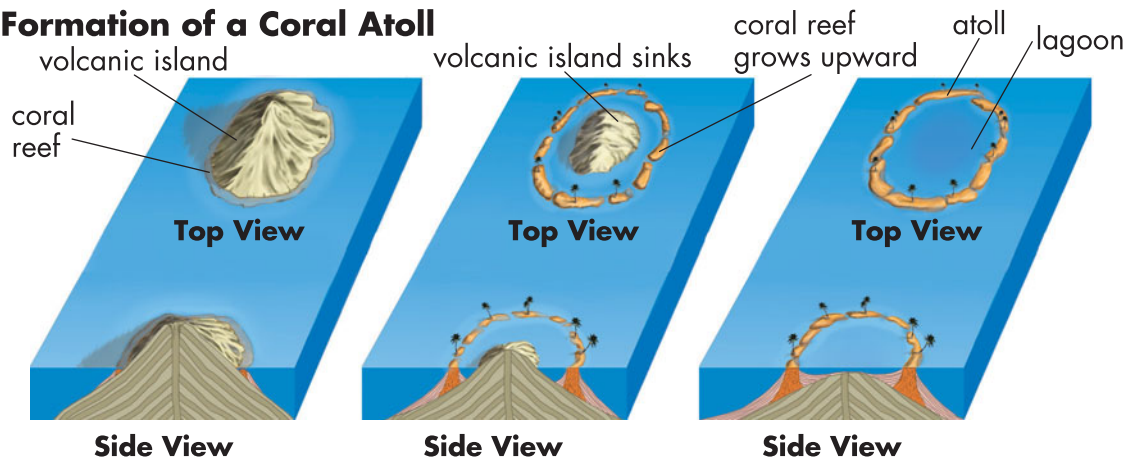
Island

An island is an area of land that is surrounded by water. Islands can be found in all bodies of water, from streams and rivers to lakes, seas, and oceans. The two main types of islands are oceanic islands and continental islands.



An oceanic island in the South Pacific rises from the ocean floor.

Formation of a Coral Atoll



An atoll is a ring of land surrounding a pool of water called a lagoon. This kind of island forms from a volcanic island circled by a coral reef.

Oceanic Islands

Oceanic islands are the tops of underwater volcanoes. An oceanic island forms when a volcano erupts deep under the ocean and pushes the ocean floor upward into a mountain. The island is the top of that mountain. The Hawaiian Islands are examples of oceanic islands.

Atolls are another type of island in the ocean. An atoll is a ring of land around a shallow body of water called a lagoon. Atolls form when corals build a colony, or reef, around the top of an underwater volcano. Eventually the reef reaches the surface of the water and becomes land. Atolls make up the country of the Marshall Islands.

Continental Islands

Continental islands are close to the continents. They are parts of the same land that makes up the continents. One way that continental islands form is by the flooding of valleys close to the coast. The valleys fill with seawater, and the tops of nearby hills then become islands. Long Island, which lies off the coast of

the U.S. state of New York, is a continental island.

The islands in rivers and lakes are also continental islands. The city of Paris, France, began as a settlement on an island in the Seine River.

Archipelagoes

An archipelago is a group of islands. The islands in archipelagoes may be oceanic or continental. Japan and the Aleutian Islands in the U.S. state of Alaska are archipelagoes. Indonesia is the largest archipelago in the world.



A small continental island lies in the Seine River near the town of Les Andelys, France.



Israel

The country of Israel, located in the Middle East, was founded in 1948. It was the first homeland for the Jewish people in nearly 2,000 years. Because Israel lies in territory claimed by Arabs, it has faced conflict with neighboring Arab countries. Israel has also experienced violence between Jews and Arabs (known as Palestinians) living within its borders. Israel claims Jerusalem as its capital.

Geography

Israel borders Egypt, Jordan, Syria, and Lebanon. The Mediterranean Sea lies to the west. Israelis and the Arabs of the region have long disagreed about the limits of Israel's territory.

Along the coast is a narrow plain. Hills rise in northern and central Israel. The country's highest point, Mount Meron, is in the mountains of Galilee in the north. Several valleys run the length of



The dry region known as the Negev takes up a large part of Israel.

Israel in the east. In the south is a dry, rugged region called the Negev.

In the east the Jordan River flows southward into the freshwater Sea of Galilee and the salty Dead Sea. The Dead Sea is the lowest place on Earth. It is 1,312 feet (400 meters) below sea level. Israel generally has mild, wet winters and hot, dry summers.

Plants and Animals

Modern Israelis have planted millions of trees to replace forests that were cut down long ago. Shrubs cover the hills. Desert scrub grows in the Negev. Citrus trees grow on the coastal plain.

Israel's animals include wildcats, wild boars, gazelles, ibex, jackals, hyenas, and badgers. Among its reptiles are lizards and vipers. Birds include partridges, tropical cuckoos, and desert larks.



People

Jews make up more than three fourths of the population. Jews from all over the world began settling in the region even before Israel became an independent country in 1948. Most of the rest of the people are Arabs. Judaism is the main religion, but the majority of the Arabs follow Islam. Hebrew and Arabic are the main languages. Many people also speak English. Most people live in cities, mainly along the coast.

Economy

The economy of Israel is based on services, including banking, government work, and tourism. Manufacturing is also important. The country is a top producer of cut and polished diamonds. Other products include electronics, computer software, machinery, transportation equipment, chemicals, metals, processed foods, paper products, and clothing.

Only a small number of people work in agriculture, but Israel's farms produce much of the country's food. Crops include potatoes, tomatoes, citrus fruit, wheat, grapes, apples, olives, and cotton. The main livestock are sheep and cattle.

History

The territory now known as Israel is part of a region called Palestine. The area was the ancient homeland of the Jews. Long ago it came under the control of other rulers, though some Jewish people continued to live there. In the 600s it became part of the Muslim world. In the late 1800s Jews began a movement, called Zionism, to re-create a Jewish state. The Arabs in Palestine opposed the movement.

In 1918 the British occupied Palestine. After World War II (1939–45) the British asked the United Nations to help settle the disagreements between the Jews and the Palestinian Arabs. In 1947 the United Nations voted to divide the region into separate Jewish and Arab states. Arab leaders refused to accept that decision. The State of Israel declared its independence in 1948.

The Arab-Israeli Wars

Egypt, Jordan, Syria, Lebanon, and Iraq immediately declared war on Israel. Israel won the war. It was the first of several Arab-Israeli wars. In 1949 Israel took control of three fourths of Palestine, twice as much land as proposed by the United Nations.

Israel gained more territory in the Six-Day War of 1967. It took the eastern

Facts About ISRAEL



Population
(2008 estimate)
7,018,000

Area
8,367 sq mi
(21,671 sq km)

Capital
Israel claims
Jerusalem as its
capital

**Form of
government**
Republic

Major cities
Jerusalem, Tel
Aviv-Yafo, Haifa,
Rishon LeZiyyon,
Ashdod,
Beersheba



A worker unloads a bucket full of melons on a moshav in Israel. A moshav is a kind of cooperative farm. This means that many people work together to farm the land. A kibbutz is another form of cooperative farm in Israel.



TIMELINE

Jews from around the world meet to plan a Jewish state.

Israel declares its independence; the Arab-Israeli wars begin.

Palestinians begin a violent uprising against Israel.

New violence breaks out between Israel and Palestinians.

1897	1918	1948	1967	1987	1993	2000
	Great Britain occupies Palestine.		Israel gains more land in the Six-Day War.		Israel gives Palestinians some control of the land.	

part of Jerusalem and the West Bank from Jordan, the Sinai Peninsula and the Gaza Strip from Egypt, and the Golan Heights from Syria. In 1973 Egypt and Syria launched a surprise attack on Israel. Israel lost many soldiers but eventually won the war.

In 1979 Israel and Egypt signed a peace treaty. However, Israel's relations with other Arab countries remained poor. In 1982 Israel invaded Lebanon. It wanted

to drive out Palestinian fighters belonging to a group known as the Palestine Liberation Organization (PLO). In 1987 Palestinians living in the West Bank and the Gaza Strip began a violent protest (*intifada* in Arabic) against Israel.

The Troubled Peace Process

Peace talks between Israel, the Arab countries, and Palestinians began in 1992. The following year Israel agreed to give the Palestinians some control of the Gaza Strip and the West Bank. Soon after that Israel signed a peace treaty with Jordan. In 2000 Israeli troops pulled out of Lebanon. Five years later Israel pulled its troops and settlers out of the Gaza Strip. The peace process continued to face difficulties, however.

► More to explore

Arab-Israeli Wars • Dead Sea • Jerusalem • Jordan River • Middle East • Palestine



Haifa is Israel's main port. The city overlooks the Mediterranean Sea.

Istanbul



Population
(2007 estimate)
10,757,327

Istanbul is the largest city in the country of Turkey. A channel of water called the Bosphorus divides the city into two parts. One part of Istanbul is in Europe, while the other part is in Asia.

For more than 1,500 years Istanbul was the capital of a series of powerful empires. Today Ankara, not Istanbul, is the capital of Turkey. However, Istanbul is the center of Turkey's economy and culture.

Places of Interest

A former church in Istanbul called the Hagia Sophia is considered one of the world's greatest buildings. The church was built in the 500s. It later became a mosque and then a museum.

The Topkapi Palace in Istanbul was home to the rulers of the Islamic Ottoman Empire. Many mosques were built in the city during their rule. They include the large Mosque of Süleyman and the Blue Mosque.

Economy

Istanbul is Turkey's center of trade, banking, tourism, and other service industries. The city is also an industrial



The Blue Mosque (front) is one of several magnificent mosques in Istanbul.

center. Factories in Istanbul make fabrics, clothing, processed foods, chemicals, and cement.

History

The Greeks founded the city as a colony in about the 600s BC. They named it Byzantium. In AD 330 the Roman emperor Constantine made the city the capital of the Roman Empire. He renamed the city Constantinople. The eastern part of the Roman Empire later became the Byzantine Empire. Constantinople was its capital for many centuries.

The Ottoman Turks captured Constantinople in 1453. They made it the capital of the huge Ottoman Empire. Under Ottoman rule the city became known as Istanbul. The Ottoman Empire ended in 1918. Istanbul soon became part of the new country of Turkey.

► More to explore

Ankara • Byzantine Empire • Ottoman Empire • Rome, Ancient • Turkey



Italy

The European country of Italy is shaped like a high-heeled boot. Two thousand years ago the capital of Italy, Rome, ruled one of history's largest empires. Today Italy is an important member of the European Union.

Geography

Most of Italy's land is a peninsula that extends from southern Europe into the Mediterranean Sea. Sicily and Sardinia also belong to Italy. They are two large islands in the Mediterranean. Italy shares borders with France, Switzerland, Austria, and Slovenia. The Adriatic Sea lies to the east. Italy's longest river, the Po, flows into the Adriatic.

Italy's land is mountainous. The Alps rise in the north, and the Apennines run through the peninsula. Italy's highest point, Monte Rosa, lies in the central Alps. Southern Italy has some active volcanoes, including Mount Vesuvius



A man in Italy harvests grapes that will be used to make wine.

and Mount Etna. The south is generally warmer than the north.

Plants and Animals

At the foot of the Alps, the most common trees are evergreen cork oaks, olives, and cypresses. Beech trees grow slightly higher up. At still higher elevations grow larches and spruces. Holm oaks grow in the Apennines.

Most of Italy's animals live in the mountains. Wolves hunt in the remote Apennines. Brown bears, lynx, ibex, and other animals are protected in parks and preserves in the Alps and the Apennines.

People

Nearly all the people in Italy are ethnic Italians. Almost everyone speaks Italian. Most Italians are Roman Catholics. The majority of the population lives in cities. The largest city is Rome. In the western part of Rome is Vatican City, an independent state and the headquarters of the Roman Catholic church.

Economy

Services—including tourism, banking, and communications—are Italy's main economic activities. Manufacturing is also very important. Italy's main products include iron and steel, machinery, automobiles, electrical appliances, textiles, chemicals, ceramics, and shoes. Italy has few natural resources. It must import many of the raw materials needed for industry.

Agriculture is a smaller part of the economy. Some leading farm products are wheat, olives, and grapes. Wheat flour is used in making bread and pasta, one of the main Italian foods. Olives provide olive oil for cooking. Grapes are used to make wine. Other crops include sugar beets, corn, tomatoes, potatoes, rice, and various fruits. Farmers also raise sheep, pigs, cattle, and chickens. Fishing is another important source of food.

History

More than 2,500 years ago a group of people known as the Etruscans began building a civilization in west-central Italy. The Etruscans later fell under the control of the Romans, their neighbors

to the south. Rome became the chief power in the Mediterranean world. By AD 117 the Roman Empire stretched from Britain to North Africa to what is now the Middle East.

Later, groups of people from the north invaded the Roman Empire. By AD 476 they had destroyed the empire. After that the region was divided into many small kingdoms. Various rulers tried to control the different kingdoms. The most important of these local rulers, however, was the pope. The pope was the leader of the Roman Catholic church and was based in Rome.

City-States and the Renaissance

During this period some cities in northern Italy developed into small but powerful states. They were called city-states. Among them were Florence, Venice, and Milan. These city-states competed intensely for the control of trade between Europe and Asia.

As the city-states gained wealth from trade, they became centers of art. Their rulers and merchants encouraged architecture, painting, sculpture, and literature. This growing interest in the arts is known as the Renaissance. It made Italy the cultural center of the Western world from the 1300s to the 1500s.

From Foreign Rule to Unification

In the late 1400s France invaded Italy. Until the 1800s rulers from France, Spain, and Austria controlled the various parts of Italy.

Facts About ITALY



Population
(2008 estimate)
59,760,000

Area
116,343 sq mi
(301,328 sq km)

Capital
Rome

Form of government
Republic

Major cities
Rome, Milan,
Naples, Turin,
Palermo, Genoa



The Italian city of Florence is known for its many famous museums and churches.



TIMELINE

The Roman Empire falls.		Italy becomes a united kingdom.		Italy sides with Germany in World War II.		Italy becomes part of the European Union.
about 476	about 1350	1870	1922	1940	1946	1993
	The Renaissance begins in Italy's city-states.		Fascist leader Benito Mussolini comes to power.		The Italian Republic is founded.	

In the 1800s three men began to fight against the foreign rulers. Their names were Giuseppe Mazzini, Giuseppe Garibaldi, and Camillo Cavour. They forced the rulers to leave. They then brought all the parts of Italy together as one country. By 1861 most of Italy was united under Victor Emmanuel II, who became king. The pope still controlled Rome, but in 1870 Italian troops invaded the city and took control. This completed the unification of Italy.

Mussolini and World War II

Italy joined the Allies—Russia, France, and Great Britain—during World War I (1914–18). After the war Italians were divided on many issues. Many wanted a strong leader to take charge. The dictator Benito Mussolini and his Fascist party soon rose to power. (Fascists believe that the strength of the country is all-important.) Mussolini ruled harshly. People who criticized him were imprisoned, sent far away, or killed.

Italy formed an alliance with Nazi Germany in 1936. In 1940 Mussolini brought Italy into World War II on Germany's side. When the Allies invaded Italy in 1943, Mussolini escaped. Italy surrendered to the Allies and then joined the war against Germany.

Postwar Italy

After the war, in 1946, the Italian people voted to make the country a republic. (A republic is a country not ruled by a king or queen.) Italy developed many political parties and had more than 50 changes in government by the 21st century. Nevertheless, the economy grew to be one of the strongest in the world. Italy was a founding member of the European Economic Community, which became the European Union in 1993.

► More to explore

European Union • Fascism
 • Renaissance • Rome • Rome, Ancient
 • Vatican City

Ivan IV

Ivan IV ruled the country of Russia from 1533 to 1584. In 1547 he became Russia's first tsar. The tsar was the country's highest leader at that time. Although Ivan made improvements to his country during his reign, he is remembered mostly for his cruelty. He is also called Ivan the Terrible.

Ivan was born in 1530 to Grand Prince Vasily III of Moscow and his second wife, Yelena Glinskaya. On December 4, 1533, Ivan's father died. The 3-year-old Ivan then became grand prince of Moscow. Ivan's mother ruled for him until her death in 1538.

As Russia's leader, Ivan hoped to make the country more powerful. He created new laws and reorganized the government. He also improved the military and encouraged the development of Russian culture. But he mistreated many people who opposed him. He had more than 3,000 people killed. He even struck and killed his son Ivan. After Ivan IV died in 1584, his son Fyodor became tsar.

Ivory Coast

► see Côte d'Ivoire.

Ivy

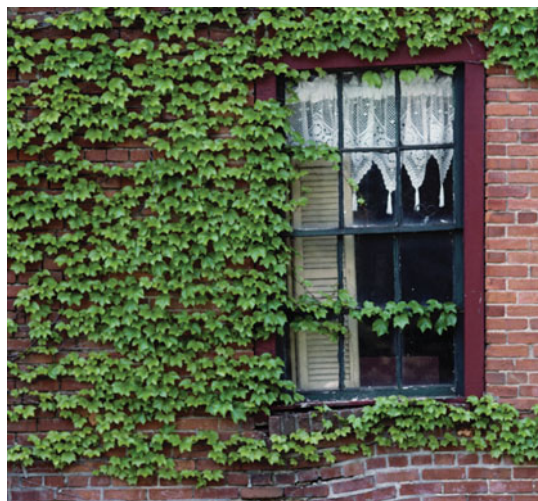
Ivy is a vine that is known for clinging to walls and trees. It grows in cool, moist regions. There are several types of ivy, but the most common is English ivy.

Ivy is native to Europe, Asia, and North Africa. Many varieties of ivy have been introduced throughout the world.

Ivy clings to walls and trees with disks that grow from the stems. As the stems reach the top of their support, they either grow to the side or hang. Leaves with three to five sections grow from the stems. Ivy does not harm trees as long as the plant is not allowed to grow too much. If it does grow wildly, it may strangle the tree. Ivy is also used as a ground cover beneath large trees where grass has difficulty growing. It is also a popular houseplant.

Some ivy growing on brick walls can be good. It encourages dryness and warmth. It also protects the wall from bad weather and adds beauty. However, if the ivy starts growing through cracks in the wall, the wall may be damaged.

Several other plants are called ivy though they are not related to the true ivies. These include poison ivy and Virginia creeper.



Ivy often covers brick buildings.

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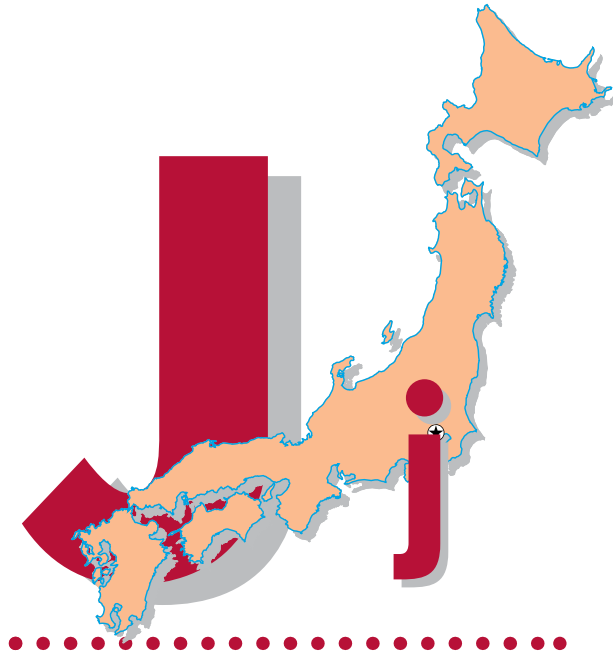
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Jakarta is the capital of Indonesia, a country in Southeast Asia.

(See Jakarta.)

Jamestown was the first permanent English colony in North America.

(See Jamestown.)

During the 1100s in Japan, warriors called samurai set up a military government.

(See Japan.)

In 1917 the Original Dixieland Jass Band made the first jazz recording.

(See Jazz.)

Thomas Jefferson wrote the famous line "all men are created equal."

(See Jefferson, Thomas.)

Some jellyfish are more than 6 feet (2 meters) across.

(See Jellyfish.)

Jackal

Jackals are wolflike animals that are related to dogs. At night jackals howl to communicate with each other. The howl can be quite bothersome to humans. People often describe the noise as sounding like loud crying or a siren.

There are three species, or types, of jackal. The golden jackal is found from eastern Europe and North Africa to southern Asia. The black-backed jackal and the side-striped jackal are found in southern and eastern Africa. Jackals live in open spaces such as grasslands.

An adult jackal is about 3 feet (1 meter) long, including the tail. It weighs about 15–24 pounds (7–11 kilograms). A jackal's fur color depends on what species it is. The golden jackal is usually yellow to pale gold. The black-backed jackal is rusty red with a black back. The side-striped jackal is grayish with a white-tipped tail and a stripe on each side of the body.

Jackals live alone, in pairs, or in groups called packs. They hide during the day



Black-backed jackals are widespread in southern Africa.

and come out at dusk to hunt. They eat small animals and plants. Packs of jackals can catch sheep and antelope. Jackals also follow lions that are hunting. Once the lion has eaten and gone, the jackals move in and eat the scraps that are left.

► More to explore

Dog

Jackson



Population
(2000 census)
184,256;
(2007 estimate)
175,710

Jackson is the capital of the U.S. state of Mississippi. It is the state's largest city. It lies along the Pearl River.

Jackson is a center of manufacturing and transportation. Goods made in the surrounding areas are shipped out from Jackson. Many residents work for the government or in communications.

A French Canadian named Louis Le Fleur built a trading post on the site of Jackson in 1792. It was called Le Fleur's Bluff. In 1822 it became the capital of Mississippi. It was then renamed after Andrew Jackson, the seventh president of the United States.

During the American Civil War, Union troops burned down Jackson. The city



The state Capitol in Jackson, Mississippi, is nestled between high-rise buildings.

then became known as Chimneyville. Jackson recovered slowly after the war. It grew rapidly during the 1900s.

► More to explore

Mississippi

Jackson, Andrew



Andrew Jackson was the seventh president of the United States.

Known as Old Hickory, Andrew Jackson served two terms as the seventh president of the United States. Jackson was

the first president to have grown up poor and on the western frontier. He made the presidency more powerful and helped to found the Democratic Party.

Early Life and Career

Andrew Jackson was born on March 15, 1767, in the western Carolinas, probably in what is now South Carolina. A few days before Andrew was born, his father died. His mother and two brothers died during the American Revolution.

Jackson studied law at an office in Salisbury, North Carolina. After 1788 he worked as a lawyer in a what later became Tennessee. Jackson married Rachel Donelson Robards in 1791. They later adopted Robards' nephew and named him Andrew Jackson, Jr.

In 1796 Jackson helped write the constitution for the new state of Tennessee. The state's voters elected him as their first representative to the U.S. House of Representatives. In 1797–98 he served as a U.S. senator. Jackson then became a judge for the highest court in Tennessee.

Military Career

In 1802 Jackson became major general of the Tennessee militia. During the War of 1812 with Great Britain Jackson fought the Creek Indians, who were British allies. He defeated them in the battle of Horseshoe Bend, in Alabama. Jackson later forced the British to leave New Orleans, Louisiana. He became a national hero.

Did You Know?

Neither Jackson nor the British knew that the War of 1812 was officially over when they fought the battle of New Orleans.

After the war Jackson went to the Alabama-Georgia region. He was supposed to defend settlers against attacks by Seminole Indians from Florida. In 1818, without orders, he led his troops to Florida, which belonged to Spain. The next year, Spain agreed to give up Florida.

Presidential Elections

In 1823 Jackson returned to the Senate. The next year he ran against three other candidates for president. Jackson won the highest number of votes but not a majority. The decision went to the House of Representatives, which chose John Quincy Adams.

Jackson ran for the presidency again in 1828. His war record and background attracted voters. They saw him as a man of the people, not a rich politician from the East. With the support of the western states, Jackson defeated President Adams. Jackson's supporters formed the

new Democratic Party, which helped him win a second term in 1832.

Presidency

Jackson relied on the advice of some of the journalists and politicians who had helped elect him. That informal group came to be known as his “kitchen cabinet.” (The Cabinet is the president's official group of advisers.)

As president, Jackson ended the powerful Bank of the United States. He also strengthened the central government by opposing the rights of states to make their own decisions in certain cases. When South Carolina threatened to ignore a federal law, Jackson said he would send soldiers to enforce it.

In another case, however, Jackson allowed Georgia to ignore the U.S. Supreme Court. The state had taken lands from the Cherokee people. The Supreme Court ruled against Georgia, but Jackson did nothing to enforce the



TIMELINE

Jackson is born in the Carolinas.

March 15, 1767

Jackson defeats the British in the battle of New Orleans.

1815

Jackson is elected president.

1828

Jackson dies at his home near Nashville, Tennessee.

June 8, 1845

Tennessee elects Jackson as its first representative to Congress.

Jackson invades Spanish Florida.

Jackson retires at the end of his second term.

ruling. Georgia later forced about 15,000 Cherokee to leave. Their march west became known as the Trail of Tears.

Retirement

In 1837 Jackson retired to his home, the Hermitage, near Nashville, Tennessee. His wife had died after his election in 1828. Jackson's health grew worse until he died at home on June 8, 1845.

► More to explore

Adams, John Quincy • Trail of Tears
• United States • War of 1812

Jackson, Jesse



Jesse Jackson

Jesse Jackson fought for the rights of African Americans during the civil rights movement of the 1960s. Later on he became involved in politics and world affairs.

Jesse Jackson was born on October 8, 1941, in Greenville, South Carolina. He

went to college at the University of Illinois and at North Carolina Agricultural and Technical College. Then he studied religion in Chicago, Illinois. In 1968 he became a Baptist minister.

Jackson joined the civil rights movement while he was a student. In 1965 he began working for the Southern Christian Leadership Conference (SCLC). The SCLC was a civil rights group led by Martin Luther King, Jr.

In 1971 Jackson founded the group People United to Save [or Serve] Humanity (PUSH). This group helped African Americans to get jobs and to open businesses. In 1984 Jackson founded the National Rainbow Coalition to help all kinds of people, not just African Americans. (These two groups joined in 1996 to form the Rainbow/PUSH Coalition.)

Jackson ran for U.S. president as a Democrat in 1984 and 1988. He did not win. But he did better than any African American presidential candidate who had come before.

Jackson also gained a lot of attention for his role in world affairs. He spoke out against apartheid (separation of the races) in South Africa. He took part in peace talks in the Middle East. He also worked with several countries to free U.S. citizens being held as prisoners.

► More to explore

Civil Rights Movement • King, Martin Luther, Jr.

Did You Know?

In 1990 Washington, D.C., residents elected Jackson as a "statehood senator." His job was to try to get statehood for the city.

Jaguar

The jaguar is the largest cat that lives in the Americas. It is found mainly in the Amazon rain forest of South America. The scientific name of the jaguar is *Panthera onca*.

The jaguar looks much like the leopard. But the jaguar is larger and has bigger black spots. The average jaguar is between 5 and 6 feet (1.5 and 1.8 meters) long, not including the tail. Males weigh between 220 and 350 pounds (100 and 160 kilograms). Females are usually smaller. The jaguar has a large head and big legs. Its coat ranges from deep yellow to golden brown.

The jaguar hunts alone at night. It is a swift animal that climbs and swims well. The jaguar preys on piglike animals called peccaries. It also eats rodents, deer, birds, crocodiles, and fish.

The jaguar once lived in forests ranging from the southern United States to



The jaguar gets its name from the American Indian word *yaguar*, meaning "he who kills with one leap."

Argentina. Today there are far fewer jaguars scattered over a much smaller area. Some of the forests have been destroyed. The animals therefore have fewer places to live. People hunt jaguars for sport and for their fur. People also kill jaguars because the animals sometimes eat cattle.

► More to explore

Cat • Leopard

Jail

► see Prison.

Jainism

Along with Hinduism and Buddhism, Jainism is one of the three major religions that started in ancient India. Its followers are called Jains. In the early 21st century there were more than 4 million Jains, most of them in India.

Jains believe that after people die, they are reborn as other beings. By purifying their souls, they believe, they can eventually free themselves from repeated rebirth. Jains believe that 24 men, the Tirthankaras (saviors), have escaped rebirth.

For Jains, purifying the soul involves practicing ahimsa, or nonviolence. This means that they should not harm any living thing, including humans, animals, and insects. Also, Jains believe that no group of people is above or below any other group.



Jain people in India celebrate a festival by pouring holy water over a statue.

To avoid harming living things, Jains do not eat any meat. In temples and at shrines they pay respect to the 24 Tirthankaras. At certain times they fast, or refuse to eat, to help purify the soul. Jain monks and nuns follow Jainism more strictly. They dedicate their lives to purifying their souls.

Jainism began during the 600s–400s BC in eastern India. Hinduism was the main religion there. But some people rejected certain Hindu beliefs, including the idea that only the highest group of people could perform religious ceremonies. Some of these opponents of Hinduism founded Jainism.

Jains believe their religion started with the 24 Tirthankaras. Mahavira, who probably lived in the 500s or 400s BC, was the last savior. Mahavira taught people how to purify their souls. He

converted many Hindus to his ideas, later called Jainism.

► More to explore

Buddhism • Hinduism • Monk

Jakarta



Population
(2005 estimate)
8,603,349

Jakarta is the capital of Indonesia, a country of Southeast Asia. It is one of the largest cities in the world. Jakarta is located on the coast of the island of Java.

Jakarta is a major center of education, industry, banking, and trade. It is the country's largest port. Its factories make soap, cloth, food, and machines.

Jakarta was founded in 1527 after a local ruler defeated Portuguese troops there. He called the city Jayakarta, meaning "glorious fortress."

Dutch traders captured and destroyed the city in 1619. They then built their own town, named Batavia, there. It became the capital of the Dutch government in Indonesia.

Indonesia became an independent country in 1949. The city was renamed Djakarta, and it became the capital. In 1972 the city was renamed Jakarta.

► More to explore

Indonesia

Did You Know?

Jakarta has many citizens of Chinese, Indian, and Arab ancestry.



Jamaica

Jamaica is part of the West Indies in the Caribbean Sea. Jamaica is known for reggae, a type of music. The capital is Kingston.

Geography

Jamaica lies south of Cuba and west of Haiti. The island is mountainous with plains along the coast. Jamaica has warm weather year-round. Hurricanes sometimes cause severe destruction.

Plants and Animals

Ebony, mahogany, and rosewood trees grow in some valleys. Other plants include bamboo, orchids, and ferns.

Jamaica is home to birds, bats, frogs, and crocodiles.

People

Most of Jamaica's people are of African origin. A smaller group has mixed African and European roots. There are also small numbers of East Indians, Chinese, and whites. Most people speak English



Many people visit Jamaica for its beautiful beaches and mild weather.

or Jamaican Creole. More than half of Jamaicans live in cities.

Economy

Jamaica's economy is based mainly on services, especially tourism. Mines provide the mineral bauxite, from which aluminum is made. Factories make cement, processed foods, and clothing. Farmers grow sugarcane to make raw sugar, molasses, and rum. Other crops are citrus fruits, bananas, and coffee.

History

The Arawak people lived on the island when Christopher Columbus sighted it in 1494. The Spanish took control in the early 1500s and enslaved many Arawak. The British seized Jamaica in 1655. They brought in Africans to work as slaves on sugar plantations. Jamaica gained independence in 1962.

► More to explore

Arawak • Kingston • West Indies

Facts About JAMAICA



Population
(2008 estimate)
2,688,000

Area
4,244 sq mi
(10,991 sq km)

Capital
Kingston

Form of government
Constitutional monarchy

Major cities
Kingston, Portmore, Spanish Town, Montego Bay, May Pen



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Jamestown

Jamestown was the first permanent English colony in North America. It was located on a piece of land in the James River, near what is now Williamsburg, Virginia.

The people who founded Jamestown were members of the Virginia Company of London. King James I of England gave them the right to settle along the east coast of North America. Their goal was to find ways to make money.

The 105 colonists, all men, arrived in North America in May 1607. Life in the colony was hard. Many colonists died from illness and lack of food.

Conditions in Jamestown improved under the leadership of Captain John Smith. Under his direction, the colonists built houses and forts and dug a well. They also fished and planted crops. After being injured, Smith returned to England in the autumn of 1609.

The Native Americans of the region, called the Powhatan confederacy, sometimes gave the colonists food. But the two groups did not always trust each other.

After Smith left, the Native Americans stopped sharing food with the colonists. They also attacked colonists who left Jamestown. As a result more than 80 percent of the colonists died during the winter of 1609–10. This period was called the Starving Time.



The first colonists built Jamestown on a marshy piece of land on the James River.

More colonists arrived in 1610. In 1612 a colonist named John Rolfe began growing tobacco. The colonists sold tobacco to England, which helped Jamestown to survive.

In 1614 Rolfe married Pocahontas, the daughter of the chief of the Powhatan confederacy. This brought eight years of peace between the colonists and the Native Americans.

The colonists formed a democratic government in 1619. In the same year the first Africans arrived. The colonists treated Africans first as servants and later as slaves.

In 1624 Virginia became a royal colony, ruled by the king of England. Jamestown was Virginia's capital at first. In 1699 the capital was moved to Williamsburg. Today the site of Jamestown is part of Colonial National Historical Park.

► More to explore

Americas, Exploration and Settlement of the • Colony • Pocahontas • Virginia



Japan

The Asian country of Japan is marked by contrast between old and new. The country values its complex and ancient cultural traditions. Yet Japan is known for its powerful, modern economy and its advanced technology. Japan's capital is Tokyo.

Geography

Japan is located off the east coast of Asia. It consists of four large islands and more than 3,900 smaller islands. The islands form an arc that stretches across about 1,500 miles (2,400 kilometers). From north to south the main islands are Hokkaido, Honshu, Shikoku, and Kyushu. The largest is Honshu, which is considered the Japanese mainland.

The Pacific Ocean borders Japan's eastern shores. On the west the Sea of Japan, also called the East Sea, separates Japan from North Korea, South Korea, and



Cherry flowers surround a pagoda in Kyoto, Japan. A pagoda is a tower that may serve as a temple or a memorial.

Russia. China is to the southwest, across the East China Sea.

Mountains cover most of the land. Some mountains are active volcanoes. Mount Fuji, in central Honshu, is Japan's highest point. It is 12,388 feet (3,776 meters) high.

The southern islands are generally warmer than the northern ones. All the islands receive plenty of rain. Japan also experiences hundreds of earthquakes every year.

Plants and Animals

Forests cover a large part of Japan. The country's evergreen trees include pines, cypresses, hemlocks, cedars, firs, and spruces. Numerous broad-leaved trees include oaks, maples, ashes, birches, beeches, and poplars. Bamboo and palms grow in southern and central Japan. Cherry trees are known as sym-

bols of Japan. The Japanese plant them throughout the country. They also grow wild in the mountains.

Many animals live in the forested mountains. Mammals include bears, foxes, deer, wild boars, antelope, hares, and wild monkeys. The seas are home to whales, dolphins, porpoises, and a wide variety of fish. The raising of goldfish and colorful carp is a Japanese specialty.

People

Most Japanese people share the same ethnic and cultural background. They are closely related to the other peoples of East Asia. One group of Japanese, the *burakumin* (people of the village), often live in poorer conditions than other Japanese. Their ancestors belonged to the lowest class in traditional Japanese society. Koreans form the largest minority group. There are also small numbers of Ainu, a native people of northern Japan.



Japanese Kabuki plays are colorful combinations of singing, dancing, mime, and drama.

The country's main language is Japanese. Shinto and Buddhism are the major religions. Most Japanese live in cities, mainly on Honshu.

Economy

Most Japanese work in services, including banking, health care, and communications. Manufacturing and international trade are also strong parts of the economy. Japan is a leading maker of ships, automobiles, watches, and electronics—especially cellular phones, television sets, computers, cameras, photocopiers, and robots. Japan also produces steel, chemicals, plastics, cement, fabrics, and paper.

Farming and fishing are small parts of the economy. Nevertheless, Japan produces large amounts of food. Its leading crops include rice, potatoes, sugar beets, fruits, vegetables, and tea. Japan also catches more fish than most other countries do.

History

People lived in Japan at least 10,000 years ago. According to legend, the emperor Jimmu founded the Japanese state in 660 BC. Historical records, however, show that Japan was not united as one state until the late AD 300s or early 400s.

For many centuries the Japanese borrowed heavily from Chinese culture. The Japanese adopted Chinese characters to write the Japanese language. They also used some Chinese ideas about government. Japan's culture became more Japanese after the 800s.

Facts About JAPAN



Population
(2008 estimate)
127,674,000

Area
145,903 square miles (377,887 square kilometers)

Capital
Tokyo

Form of government
Constitutional monarchy

Major cities
Tokyo, Yokohama, Osaka, Nagoya, Sapporo



TIMELINE

Japan becomes a unified kingdom.		Japan bans its people from traveling overseas.		The Japanese attack Pearl Harbor, Hawaii.		Junichiro Koizumi becomes Japan's 87th prime minister.
about 400	1192	1635	1868	1941	1945	2001
	The samurai set up a military government, or shogunate.		The emperor Meiji takes power and modernizes Japan.		The United States drops atomic bombs on Japan.	

Military Government

During the 1100s a class of warriors called samurai rose to power. The samurai often managed the estates of wealthy people, and sometimes they held land themselves. The samurai developed advanced military skills.

In 1185 a samurai named Minamoto Yoritomo took control of Japan. In 1192 he took the title of shogun. His military government was called a shogunate. Japan had an emperor, but he held less power than the shogun.

From the 1300s to the 1500s powerful families fought each other for control of Japan. The country was divided into private estates ruled by the landowners. The shogun and the emperor became less powerful.

Meanwhile Japan was developing trade contacts with the outside world. Trade missions to China began in 1404. In

1543 Portuguese traders arrived in Japan. Spanish, English, and Dutch traders followed.

The division and disorder in Japan ended in the late 1500s. Powerful leaders defeated the local landowners and united the country.

During the 1600s and 1700s strong shoguns of the Tokugawa family ruled Japan. Japan enjoyed peace, stability, and a growing economy. At the same time, the shoguns began to fear conquest by foreign powers. They banned Christianity (a foreign religion), stopped foreign travel, and cut back on foreign trade.

By the mid-1800s the Tokugawa shogunate was unable to keep European and U.S. traders away. The shogun's support among the Japanese people collapsed. In 1868 the shogun was forced to step down.

The Japanese Empire

Japan set up a new government under an emperor who took the name Meiji, meaning “enlightened government.” The transfer of power from the shogunate to the Meiji emperor was the start of Japan’s modern era.

Japan soon started to build an empire. It defeated China and Russia in war. It made Korea into a Japanese colony in 1910. During World War I (1914–18), Japan fought on the side of the Allies (mainly Great Britain, France, and Russia). Japan seized additional territory in East Asia during the war.

World War II

In 1931 Japan seized the region called Manchuria from China. Japan moved troops into China in 1937 and into Southeast Asia in 1940. The Japanese also formed an alliance with Germany and Italy. The three countries were known as the Axis powers. They fought against the Allies during World War II (1939–45).



Crowds of people cross a street in a busy Japanese city. Japan has many large cities.

In 1941 Japan attacked U.S. forces at Pearl Harbor, Hawaii. The attack pulled the United States into the war. In 1945 the United States dropped atomic bombs on the Japanese cities of Hiroshima and Nagasaki. The bombs destroyed large parts of the cities and killed more than 100,000 people. The Japanese then surrendered.

Postwar Japan

After the war Japan had to give up all the territory it had acquired since 1895. It also broke up its military. In addition, U.S. forces occupied Japan until 1952. A new constitution in 1947 took power away from the emperor and made Japan more democratic.

Japan rebuilt its ruined economy with the help of new technology. By 1990 Japan had one of the world’s largest economies. Although economic growth slowed in the 1990s, Japan remained one of the richest countries in the world.

► More to explore

Fuji, Mount • Hiroshima • Samurai
• Shinto • Tokyo • World War II



Girls wear traditional clothing at a festival in Kanazawa, Japan. Many Japanese cities, towns, and temples hold local festivals.

Jazz

Jazz is a type of music. It began among African Americans. Today jazz is popular all over the world.

Features

There are many different kinds of jazz music. But most jazz is at least partly improvised. This means that a jazz musician composes (makes up) the music while playing it, rather than beforehand.

Jazz bands can have many different types of instruments. They often feature drums, piano, bass, trumpet, trombone, and saxophone. Jazz often includes singers, too.

History

In the 1700s and 1800s enslaved people from Africa brought their music to the United States. Jazz grew from a mix of African and European music. Ragtime, a form of piano music, and blues music also influenced jazz.



The Preservation Hall Jazz Band performs in New Orleans, Louisiana.

New Orleans, Louisiana, is often called the home of jazz. Many important early jazz musicians, such as pianist Jelly Roll Morton, were from New Orleans. In 1917 the Original Dixieland Jass Band, a New Orleans band, made the first jazz recording.

In about 1918 many musicians from New Orleans began heading north. Chicago, Illinois, quickly became the jazz capital of the United States. New York City became an important center for jazz, too.

Louis Armstrong was an important jazz musician from this time. Armstrong's style of jazz became known as swing. It was popular throughout the 1930s and 1940s. Other famous swing musicians included orchestra leader Benny Goodman and singer Billie Holiday.

Another popular type of jazz music was called big-band jazz. Large orchestras with many musicians played this kind of jazz. Duke Ellington was a famous jazz musician, composer, and big-band leader. Count Basie was another well-known bandleader.

Jazz music continued to grow and change throughout the 1950s and 1960s. Some famous jazz musicians from this time include saxophonist Charlie Parker and trumpeter Miles Davis.

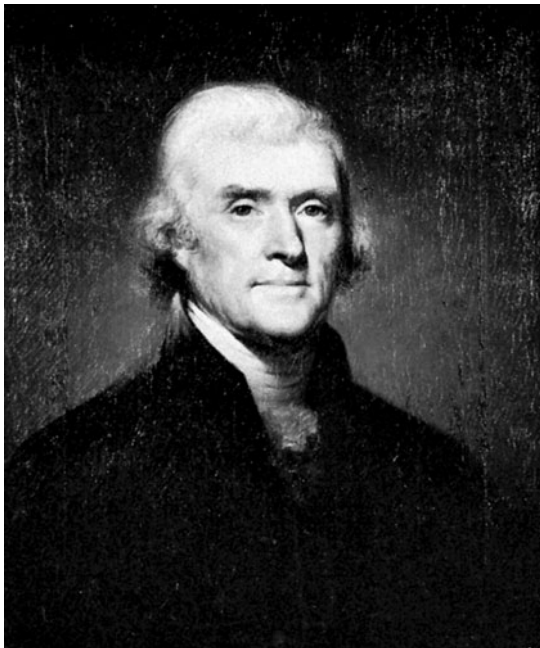
During the 1970s and 1980s musicians from many countries created new kinds of jazz. The result was fusion music.

This kind of music combined jazz, rock, and Latin American music.

► **More to explore**

Armstrong, Louis • Blues • Music

Jefferson, Thomas



Thomas Jefferson was the third president of the United States.

Thomas Jefferson was the chief author of the Declaration of Independence and the third president of the United States. Many people praise Jefferson as someone who believed strongly in the ideas of democracy, equality, and freedom. At the same time, however, he owned slaves, and that has caused some people to question his beliefs.

Early Life

Thomas Jefferson was born on April 13, 1743, in Shadwell, Virginia. His parents

were Peter Jefferson, a land surveyor, and Jane Randolph, a member of a rich family. The Jeffersons lived on a plantation with slaves. Jefferson studied at a boarding school and at William and Mary College in Williamsburg, Virginia. In 1767 he became a lawyer. The next year he designed his own home, named Monticello, near Shadwell.

Jefferson married Martha Wayles Skelton on New Year's Day in 1772. They had six children. Skelton died after 10 years of marriage, and Jefferson never remarried.

Political Career

Jefferson was elected to the Virginia legislature in 1769. He became a strong supporter of American independence from Great Britain. He served as Virginia's delegate to the Continental Congress in 1775 and 1776. In 1776 he was the main author of the Declaration of Independence. He wrote the famous lines that said "all men are created equal" and have the rights of "life, liberty and the pursuit of happiness."

Jefferson then returned to the Virginia legislature. There he proposed ending the privileges of the wealthy, making education available to all citizens, and separating church and state. In 1779 Jefferson was elected governor of Virginia. Many criticized him for not defending the state from a British attack in 1780. In 1782 Jefferson reentered the Continental Congress. After the American Revolution ended, he replaced Benjamin Franklin as U.S. minister to France.

Did You Know?

Thomas Jefferson and John Adams both died on the same day—the 50th anniversary of U.S. independence.



TIMELINE

Jefferson is born in Shadwell, Virginia.

April 13, 1743

Jefferson is elected vice president under President John Adams.

1796

The Louisiana Purchase doubles the size of the United States.

1803

Jefferson dies at his home near Charlottesville, Virginia.

July 4, 1826

Jefferson writes the Declaration of Independence.

1776

Jefferson is elected president.

1800

Jefferson retires after a second term.

1809

During 1790–93 Jefferson was the first U.S. secretary of state, under President George Washington. Jefferson clashed with Alexander Hamilton, the secretary of the treasury. Jefferson and his supporters, called Republicans (or Democratic-Republicans), believed that the states should have the power to make their own decisions in most matters. Hamilton led the Federalists, who believed in a powerful central government. In 1796 Jefferson was elected vice president under President John Adams.

Presidency

In 1800 Jefferson and Aaron Burr ran for president against President Adams. Jefferson and Burr received the same number of electoral votes. The House of Representatives eventually chose Jefferson as the winner.

The most important event of Jefferson's first term was the purchase of a large

area of land known as the Louisiana Territory from France in 1803. The territory doubled the size of the United States. The president launched the Lewis and Clark Expedition to explore the new territory. Jefferson easily won reelection in 1804, but his second term was less successful than the first. A war between Britain and France hurt U.S. trade with Europe.

Retirement

In 1809 Jefferson retired to Monticello, where he wrote, looked after his estate, and entertained friends. His last great project was founding the University of Virginia at Charlottesville. Jefferson died on July 4, 1826.

► More to explore

Adams, John • American Revolution • Declaration of Independence • Democracy • Hamilton, Alexander • Lewis and Clark Expedition • Louisiana Purchase • Slavery • United States

Jefferson City



Population
(2000 census)
39,636; (2007
estimate)
40,564

Jefferson City is the capital of the U.S. state of Missouri. The city is located on the Missouri River.

Farmers from the surrounding area sell crops and livestock in Jefferson City. Many people in the city work for the government or in health care or education. Factories in Jefferson City make shoes, books, electrical appliances, and food products.

The city began as a small settlement called Lohman's Landing. In 1821 the settlement was selected as the site for the capital of Missouri. A son of the famous American pioneer Daniel Boone laid out

the city in 1822. It was named after Thomas Jefferson, the third president of the United States. Jefferson City officially became the state capital in 1826.

► More to explore

Missouri • Missouri River

Jellyfish

Jellyfish are sea animals with a soft, jelly-like body and no bones. They have tentacles, or feelers, that they use to sting their prey. Sometimes they sting swimming people, too.

Jellyfish are related to corals and sea anemones. There are about 200 species, or types, of jellyfish. They are found in all oceans. Most live at or near the surface of the water.

A typical jellyfish is shaped like a bell or an umbrella. Some jellyfish are hardly large enough to be seen. Others are more than 6 feet (2 meters) across. Jellyfish can be transparent (see-through), white, brown, pink, blue, or maroon. Some jellyfish have eyes around the edge of the body. The mouth and stomach are in the middle of the body.

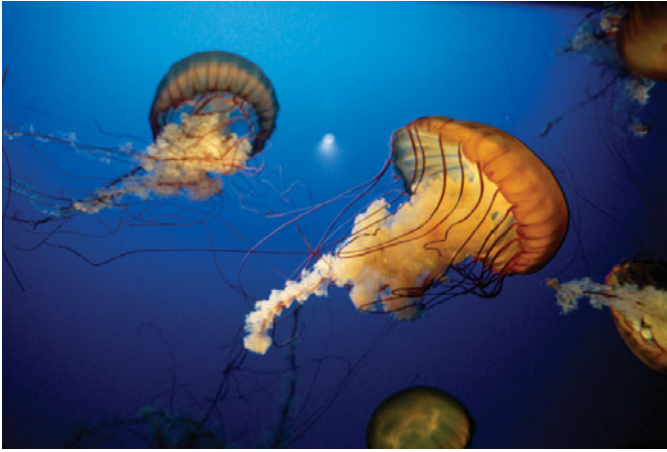
A jellyfish may have a few or many tentacles. Thin tentacles run around the edge of the body. Four or more larger tentacles hang down from the middle of the body, below the mouth. The tentacles are lined with stinging cells that make poison. The poison can stun small animals. The tentacles then pull the animals into the mouth.

Did You Know?

Jellyfish are not fish. They are a much simpler form of living thing.



Tourists leave the Governor's Mansion in Jefferson City, Missouri.



Jellyfish swim by opening and closing their bodies like an umbrella.

Certain jellyfish can be very dangerous to humans. Even a small sting from the jellyfish called sea wasps can kill a person within a few minutes.

► **More to explore**

Coral • Sea Anemone

Jemison, Mae

Mae Jemison was the first African American woman to become an astronaut. She was a part of the crew of the space shuttle *Endeavor*, which orbited Earth for more than a week in 1992.

Jemison was born on October 17, 1956, in Decatur, Alabama. She was the youngest of three children. When she was 3, the family moved to Chicago, Illinois. Even as a young girl Jemison was deeply interested in science.

Jemison graduated from high school at age 16. She then received a scholarship to attend Stanford University in California. She graduated from there in 1977 with a degree in chemical engineering.

After Stanford, Jemison attended medical school at Cornell University in New York. She received her medical degree in 1981. She worked as a doctor first in Los Angeles, California, and then with the Peace Corps in West Africa.

Then Jemison applied to the National Aeronautics and Space Administration (NASA) to become an astronaut. She was one of only 15 out of 2,000 applicants accepted by NASA. Jemison entered NASA's astronaut program in 1987. In 1992 Jemison flew aboard the shuttle *Endeavor* as the science mission specialist. At the time she was the only female African American astronaut.

After retiring from NASA in 1993, Jemison founded her own company, the Jemison Group. The company created new technologies, especially to help developing countries. Jemison also cre-



Mae Jemison works aboard the space shuttle *Endeavor*.

ated an international science camp for teenagers.

► More to explore

African Americans • Science • Space Exploration

Jerusalem



Jerusalem is an ancient city in the Middle East. Three major religions—Judaism, Christianity, and Islam—regard the city as holy. In modern times the country of Israel and the Palestinian Arabs have fought for control of Jerusalem. Israel claims the city as its capital. However, the Palestinians have protested that claim.

Major Holy Sites

The part of Jerusalem called the Old City has many important religious sites. Jews consider the Western Wall to be a holy place of prayer. It is all that remains of the Second Temple of Jerusalem, which was destroyed in ancient times.

Christians consider Jerusalem holy because of its connections with Jesus. The Church of the Holy Sepulchre is in Jerusalem. Christians built it over the



Jews pray at the Western Wall in the Old City of Jerusalem. Behind the Western Wall is the Dome of the Rock.

place where they believe Jesus was killed, buried, and then raised from the dead.

The holiest Muslim site in Jerusalem is a monument called the Dome of the Rock. Muslims believe it marks the place where an angel carried Muhammad, the founder of Islam, up to heaven.

Economy

Many people in Jerusalem work at jobs serving the public, such as in government, health care, or education. The city is also a center of tourism and banking. Factories in the city make electronics, processed foods, and other products.

History

People have lived in Jerusalem for at least 5,000 years. In about 1000 BC King David made Jerusalem the capital of the Jewish kingdom of Israel. The Jews built the First Temple of Jerusalem in the 900s BC. Troops from Babylonia

Did You Know?

The Old City is surrounded by a stone wall built in 1538–40. Newer parts of Jerusalem were built outside the wall.

destroyed the temple in 586 BC. They also forced many Jews to leave Jerusalem. About 50 years later the Jews returned and built the Second Temple.

Jesus was killed in Jerusalem in about AD 30. At that time Jerusalem was part of the Roman Empire. In AD 70 the Romans destroyed much of the city, including the Second Temple.

Various Muslim leaders ruled Jerusalem for most of the 600s to the early 1900s. Christian soldiers called Crusaders captured the city a few times during the 1000s to 1200s.

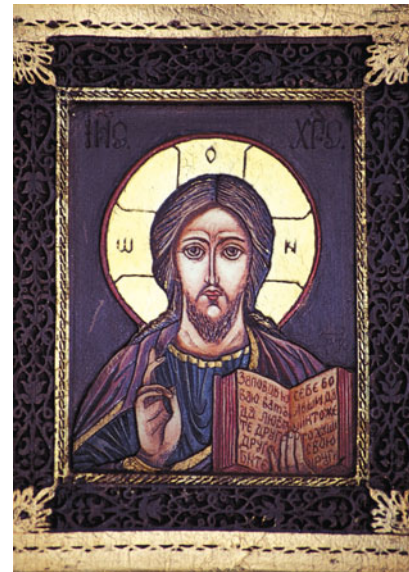
In 1948 the country of Israel was created. The United Nations was supposed to rule Jerusalem as an international city. However, war broke out. During the fighting the country now called Jordan captured Jerusalem's eastern section. Israel captured Jerusalem's western section. Israel took control of the entire city in 1967.

► More to explore

Christianity • Crusades • Islam • Israel
• Jesus Christ • Judaism • Muhammad
• Palestine

Jesus Christ

The teachings of Jesus, or Jesus Christ, are the basis of Christianity. Christians believe that Jesus was the Messiah—a savior sent to deliver people from sin. The word Christ comes from *Khristos*, the Greek word for Messiah.



A painting shows an artist's idea of what Jesus looked like. The halo around Jesus' head is a symbol of holiness.

Early Life

Nearly everything known about Jesus comes from the Bible, in the four books of the New Testament known as the Gospels. According to the Bible, the angel Gabriel visited a woman named Mary and told her she would give birth to the Son of God. Her son, Jesus, was born in about 6 BC in Bethlehem, a city in the Middle Eastern region of Palestine. Mary and her husband, Joseph, were from Nazareth, and that is where Jesus grew up.

Ministry

Jesus began preaching when he was about 30 years old. He gathered a group of 12 followers, or disciples, called the apostles, who helped him spread his message. Jesus was a Jew, and many of his teachings grew out of Judaism. He taught people to forgive others, to live a good life, and to honor God so as to

enter God's kingdom. He often taught by using parables, or short stories that illustrated his message. The Gospels also describe various miracles he performed, such as raising the dead, turning water into wine, and healing the sick. Jesus attracted many followers.

Opposition to His Ministry

Jesus welcomed all types of people, even those whom Jewish religious leaders considered to be sinners. Some religious leaders thought that Jesus' teaching was wrong and that it was leading people astray. Others feared that he might start a political uprising and that this would lead to great trouble.

Death and Resurrection

Jesus knew that opposition to him was growing and that one of his disciples, Judas Iscariot, was turning against him. Jesus gathered the apostles together for a meal, later known as the Last Supper. He told them that his death was necessary because it would establish a new bond between God and humans. Jesus took bread and wine, blessed them, and shared them with his disciples. Christians remember this in a ceremony known as Holy Communion or the Lord's Supper.

Later that night, Judas brought men to arrest Jesus, and Jesus was sentenced to death. He was crucified, or nailed to a cross. He died on the cross and was buried nearby.

On the third day after that, a group of women went to Jesus' tomb and found the body gone. The Gospels tell that

Jesus then appeared to one of the women, Mary Magdalene, and to the disciples. He spent 40 days on Earth after his Resurrection, or return from the dead, and then was taken up to heaven.

The story of Jesus' Resurrection is central to Christian belief. His apostles continued to teach his message after his death, and as that message spread, Christianity was born.

► More to explore

Bible • Christianity • Judaism • Palestine

Jewelry and Gems

Jewelry is any object other than clothes that is worn to decorate the body. People use many different materials in making jewelry. Fine jewelry is made of valuable



A girl wears a necklace made of beads and shells.

metals, such as gold and silver, and beautiful stones called gems. Jewelry that is made of plastic, steel, ceramics, glass, or other less costly materials is called costume jewelry. People who still live as their ancient ancestors did make jewelry from bone, claws, animal hair, wood, and shells.

The Importance of Jewelry

People wear jewelry for many reasons. Kings, queens, and other leaders have often worn fine jewelry at important ceremonies and events. Some people wear jewelry for religious reasons. Many people wear jewelry to mark an important life event. For example, many men and women give each other rings at their weddings.

Types of Gems

Most gems are hard minerals that are found naturally in the earth. However, a few gems come from animals or plants. Pearls form inside the shells of oysters, clams, and other animals called



Some pearls form naturally inside the shells of mollusks. Other pearls, called cultured pearls, form after people stick beads or other tiny objects inside a mollusk's shell.

mollusks. Amber is tree sap that has fossilized, or turned to stone. Jet is a hard form of brown coal, which is made from fossilized plants. Coral comes from the skeletons of sea animals called corals.

The color of gems ranges from colorless to pure black. Gems may be transparent (see-through) or opaque, which means that light cannot shine through them.

Among the rarest and most valuable gems are diamonds, rubies, emeralds, and sapphires. These gems are all transparent minerals. Diamonds may be yellow, pink, blue, or black. Rubies are red, and emeralds are green. Sapphires may be blue, violet, yellow, green, or almost black.

Other valuable gems include jade, carnelian, and lapis lazuli. These gems are opaque. Jade is usually green, but it can also be pink, white, or lavender. Carnelian is red or reddish brown. Lapis lazuli is blue with gold-colored flecks in it.



The crown of Queen Victoria, who ruled the United Kingdom from 1837 to 1901, is filled with diamonds.

History

People have been making jewelry for tens of thousands of years. Ancient peoples made jewelry from teeth and animal bones. People began making jewelry from gold more than 4,000 years ago. In ancient times and in the Middle Ages people shaped and polished gems to make them round and shiny. In the 1400s people discovered how to cut gems to give them many flat surfaces called facets. Facets make gems sparkle. In the 1800s people learned how to make artificial, or fake, gems.

► More to explore

Mineral

Joan of Arc

Joan of Arc is a national heroine of France. Born a peasant, she became a military leader while just a teenager.

Joan of Arc was born in Domrémy, France, probably in 1412. At the time France and England were fighting the Hundred Years' War. Reims, the city where French kings traditionally were crowned, was in enemy hands. As a teenager Joan claimed that the voices of saints commanded her to drive the English out of northern France. Charles VII, heir to the French throne, could then be crowned king in Reims.

Joan traveled far to visit Charles at his castle. Some of Charles's advisers were suspicious of her. Church officials thought she might be a witch. They asked her many questions. Finally they advised Charles to use Joan's services.

Joan inspired the French troops with her great spirit. In 1429 she led them to victory over the English in a battle in the French city of Orléans. The army then entered Reims. Joan stood beside Charles VII as he was crowned king.

Joan fought other battles, too. In 1430 she got separated from her soldiers and was forced to surrender. The English put her on trial. She was charged with witchcraft and other crimes against the church. She had to confess to wrongdoing or be put to death.

Joan confessed but then changed her mind. She said that saints had criticized her for confessing. On May 30, 1431, she was burned to death at the stake. She was just 19 years old. Years later a church court canceled the judgment



Joan of Arc watched as Charles VII was crowned king of France in 1429.

against Joan. In 1920 the Roman Catholic church made Joan a saint.

► More to explore

France • Saint

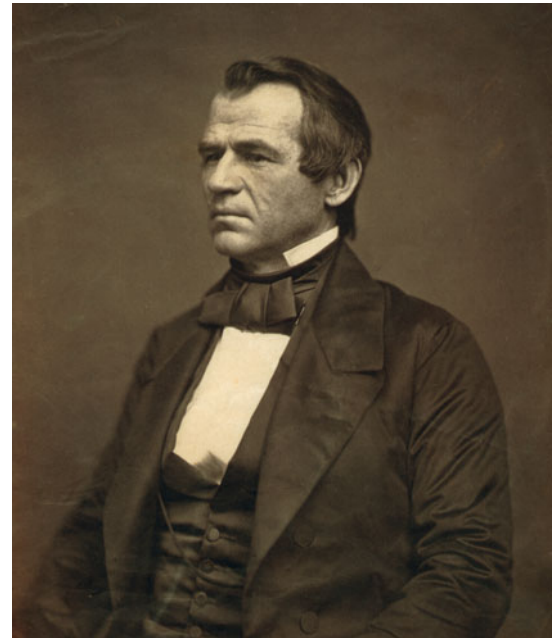
Johnson, Andrew

Andrew Johnson became president of the United States in 1865, when Abraham Lincoln was assassinated. Johnson's biggest challenge was the rebuilding of the Southern states, which had just lost the American Civil War.

Early Life

Andrew Johnson was born in Raleigh, North Carolina, on December 29, 1808. His father, Jacob Johnson, died when Andrew was young. His mother, Mary McDonough Johnson, worked as a spinner and a weaver.

In 1826 the poor family moved to Greeneville, Tennessee, where Johnson opened a tailor shop. At age 18 he mar-



Andrew Johnson was the 17th president of the United States.

ried Eliza McCardle. The couple had five children.

Political Career

Johnson served as mayor of Greeneville. In 1835 he entered the Tennessee legislature. In 1843 he began the first of five terms in the U.S. House of Representa-



TIMELINE

Johnson is born in Raleigh, North Carolina.

December 29, 1808

Johnson is elected vice president under President Abraham Lincoln.

1864

Congress impeaches Johnson but finds him not guilty.

1868

Johnson dies in Tennessee.

July 31, 1875

Johnson becomes governor of Tennessee.

1853

Johnson becomes president after Lincoln is killed.

1865

Johnson retires from the presidency.

1869

tives. Afterward he served two terms as governor of Tennessee. In 1857 he entered the U.S. Senate.

After Abraham Lincoln became president in 1860, Johnson was the only Southern senator who did not resign in protest. Many people in the South disagreed with Lincoln over the issue of slavery. They were afraid that Lincoln would try to end slavery. This soon led to the Civil War. Johnson, however, sided with the Union, not the Southern states. Lincoln appointed him military governor of Tennessee in 1862.

Johnson was a Democrat, but in the 1864 election the Republicans chose him to run as Lincoln's vice president. The party hoped to win the votes of Democrats who supported the Union. Lincoln and Johnson won easily.

Presidency

When Lincoln was assassinated on April 14, 1865, Johnson became president. The Civil War was over, and Johnson had to rebuild the Union—a process called Reconstruction. He spent much of his term struggling with the Republicans in Congress.

The Republicans set harsh rules for letting Southern states back into the Union. They also wanted to ensure civil rights for freed slaves. Johnson did not want to punish the South or give blacks the right to vote. He vetoed, or rejected, Congress's acts. However, Congress overrode the vetoes, or passed the acts with a large majority of votes.

Congress also passed a law preventing the president from firing government officers. When Johnson fired his secretary of war, the House of Representatives voted to impeach Johnson (put him on trial) for breaking the law. Johnson was the first U.S. president to be impeached. The Senate found Johnson not guilty.

Last Years

Johnson left office in 1869 and returned to Tennessee. In 1875 he reentered the U.S. Senate. He died soon afterward, on July 31, 1875.

► More to explore

American Civil War • Lincoln, Abraham
• Reconstruction • United States

Johnson, Jack

Jack Johnson was the first African American to win the heavyweight boxing championship of the world. He was famous during a time of great uneasiness



Jack Johnson

between blacks and whites. Many white people hated Johnson for being successful. They criticized him unfairly.

John Arthur (Jack) Johnson was born in Galveston, Texas, on March 31, 1878. He dropped out of school after the fifth grade. He began boxing professionally in 1897.

Johnson won the heavyweight title in 1908. He defeated Tommy Burns in a fight in Australia. Johnson lost the title in 1915, when Jess Willard knocked him out after 26 rounds.

Johnson's professional career lasted until 1928. In that time he fought more than 100 matches. He was knocked out only three times.

In 1912 Johnson broke a law by crossing a state line with his bride before they were married. He was sentenced to a year in prison. To avoid jail, he fled to Canada disguised as a member of a black baseball team. Johnson returned to serve his sentence in 1920.

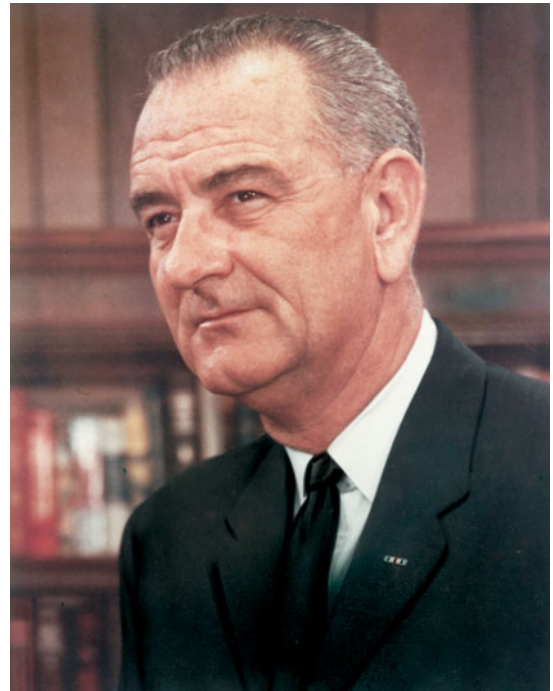
After his release from prison, Johnson boxed sometimes. He also performed in carnival acts. He eventually owned his own supper club.

On June 10, 1946, Johnson was killed in an automobile accident in Raleigh, North Carolina. He was inducted into the Boxing Hall of Fame in 1954.

► More to explore

Boxing

Johnson, Lyndon B.



Lyndon B. Johnson was the 36th president of the United States.

Lyndon B. Johnson became president of the United States in 1963, when John F. Kennedy was assassinated. During his presidency Johnson introduced important social laws, including a civil rights bill. He is also remembered for expanding U.S. involvement in the Vietnam War.

Early Life

Lyndon Baines Johnson was born on August 27, 1908, on a farm near Stonewall, Texas. He was the oldest of five children. His father, Sam Ealy Johnson, Jr., was a businessman and a member of the Texas legislature. His mother, Rebekah Baines Johnson, was a daughter of a state legislator.

Did You Know?

Jack Johnson continued to box in non-championship matches until he was about 67 years old.

After graduating from college in 1930, Johnson taught at a Houston high school. The next year he went to Washington, D.C., as an assistant to a Democratic congressman. In 1934 Johnson married Claudia Alta Taylor, known as Lady Bird. The couple had two daughters.

Political and Military Career

In 1937 Johnson entered the U.S. House of Representatives. He joined the U.S. Navy in 1941. After fighting in World War II, Johnson was elected to the U.S. Senate in 1948. During his 12 years there he became the leader of the Democratic senators. He had a heart attack in 1955 but soon went back to work.

Presidency

In 1960 Johnson ran for vice president under the Democrat John F. Kennedy. The Republican presidential candidate was Richard M. Nixon. Johnson's influence in the South helped the Democrats

to win. On November 22, 1963, Kennedy was assassinated in Dallas, Texas. Johnson was sworn in as president that afternoon.

Johnson helped to calm the mourning nation. He urged Congress to pass laws that Kennedy had proposed. In July 1964 Johnson signed the historic Civil Rights Act. The act's goal was to end racial discrimination.

In the presidential election of 1964 Johnson defeated Republican Barry Goldwater. In his second term Johnson continued his program of reforms called the Great Society. He signed laws to fight poverty and to improve education, medical care for the aged, and housing. In 1965 Congress passed the Voting Rights Act, which outlawed the many ways that people had tried to prevent African Americans from voting.

Despite those successes, many people criticized Johnson for sending hundreds



TIMELINE

Johnson is born near Stonewall, Texas.

August 27, 1908

Kennedy is killed; Johnson becomes president.

November 22, 1963

Johnson begins sending thousands of troops to Vietnam.

1965

Johnson dies in San Antonio, Texas.

January 22, 1973

Johnson is elected vice president under President John F. Kennedy.

Johnson signs the Civil Rights Act.

Johnson retires.

1960

1964

1969

Did You Know?

People often called Lyndon Johnson by his initials: LBJ. His Texas home was called the LBJ Ranch.

of thousands of U.S. troops to fight in the Vietnam War. Many also complained that racism and poverty were still huge problems. Beginning in the mid-1960s, several cities experienced severe rioting. In 1968 Johnson decided not to seek reelection.

Last Days

In 1969 Johnson retired to his ranch in Texas. On January 22, 1973, just a few days before the end of the Vietnam War, Johnson died of a heart attack in San Antonio.

► More to explore

Civil Rights • Kennedy, John F. • United States • Vietnam War

Johnson, Magic

Magic Johnson was a basketball player who led the Los Angeles Lakers to five National Basketball Association (NBA) championships. He was known especially for his expert passing and for his leadership on the court.

Early Life

Earvin Johnson, Jr., was born in Lansing, Michigan, on August 14, 1959. As a young boy he practiced basketball for many hours at the playground. In high school he earned the nickname Magic for his skills in handling the ball. In 1977 he helped his high school team win the state championship. Later he played for Michigan State University. He led the Michigan State Spartans to the college championship in 1979.



Magic Johnson of the Los Angeles Lakers makes a hook shot during the 1992 NBA All-Star Game.

Professional Career

That same year Johnson joined the Los Angeles Lakers. He was the team's point guard from 1979 to 1991. He was named the NBA's most valuable player six times. He also earned a gold medal as a player on the 1992 U.S. Olympic basketball team.

In 1991 Johnson found out that he had HIV. HIV is the virus that causes the disease AIDS. He left the NBA, but he returned for the 1995–96 season. In 2002 he was named to the Basketball Hall of Fame.

Beyond Basketball

In 1991 Johnson started the Magic Johnson Foundation. The foundation gives money to HIV/AIDS clinics in U.S. cities. It also builds computer centers and provides money for city chil-

dren to go to college. Johnson became part owner of the Lakers in 1994.

► More to explore

Basketball

Jolliet, Louis

Louis Jolliet was a French-Canadian explorer and mapmaker. He and Father Jacques Marquette were the first white men to explore the upper Mississippi River in North America.

Louis Jolliet was born in about September 1645 in Beaupré, Canada. He went to France to study science. After returning to Canada, he made his living trading furs near the Great Lakes.

In 1672 the French governor in North America asked Jolliet and Marquette to explore the great river west of the Great Lakes—the Mississippi. They set out with five other men on May 17, 1673,



Louis Jolliet and Father Jacques Marquette sometimes had to portage, or carry their canoes, while exploring the Mississippi River.

in two canoes made of bark. They left from Saint Ignace in what is now the Upper Peninsula of Michigan. From Lake Michigan they entered the Fox River at Green Bay. They portaged, or carried their canoes and supplies, from the Fox to the Wisconsin River. Then they continued to the Mississippi.

In July Jolliet and Marquette reached the mouth of the Arkansas River in what is now Arkansas. The Quapaw people there told them that the river flowed into the Gulf of Mexico. The explorers had hoped that the river would take them all the way to the Pacific Ocean. Jolliet and Marquette turned back and returned by way of the Illinois River. They became the first white men to visit what is now Illinois.

Jolliet later explored Hudson Bay and some Canadian rivers. He died in the summer of 1700 near Quebec, Canada.

► More to explore

Marquette, Jacques • Mississippi River

Jones, John Paul

John Paul Jones was a hero of the colonial navy during the American Revolution. He defeated a British ship in one of the most famous sea battles in history.

Early Life

John Paul Jones was originally named John Paul. He was born on July 6, 1747, near Kirkcudbright, Scotland. At about age 12, he began working on ships that carried goods for trade.

Did You Know?

Jolliet took notes on and drew maps of the Mississippi River. All were lost when his canoe overturned.

Career

By 1766 Paul had sailed to places as far away as North America and Jamaica. In 1768 a fever spread through the ship he was on. When the ship's commanders died, Paul took charge and brought the ship safely into port. The ship's owners quickly appointed him captain of the ship.

In 1772 Paul bought a ship in the West Indies. The following year he killed a sailor who challenged his authority. To escape trial Paul fled to North America, where he changed his name to John Paul Jones.

When the American Revolution began, the leaders of the American colonies made Jones a senior lieutenant in the Continental Navy. During the war Jones and his crew destroyed and captured many enemy ships.

In 1779 Jones fought his most famous battle—a fierce clash with the British ship *Serapis*. The battle took place off the east coast of England. The *Serapis*



John Paul Jones's ship the *Bonhomme Richard* is pictured in battle with the British ship *Serapis* on September 23, 1779.



John Paul Jones

was larger and better-armed than Jones's ship, the *Bonhomme Richard*. But when the British captain called to Jones to surrender, Jones yelled back, "I have not yet begun to fight!" After a long battle, the *Serapis* surrendered. However, the *Bonhomme Richard* was badly damaged, and it sank soon afterward. In 1787 Jones received a Congressional gold medal.

Retirement and Death

After serving briefly in Russia's navy, Jones retired to Paris, France. He died in that city on July 18, 1792. More than 100 years later, U.S. warships carried Jones's body back to the United States. He was reburied in a tomb at the U.S. Naval Academy in Annapolis, Maryland. His grave was made a national shrine.

► More to explore

American Revolution • Navy

Jordan

The Middle Eastern nation of Jordan is a small state with an ancient history. The country's full name is the Hashimite Kingdom of Jordan. The capital and largest city is Amman.

Geography

Jordan borders Syria, Iraq, Saudi Arabia, Israel, and the Palestinian territory of the West Bank. The Jordan River flows along Jordan's western border to the Dead Sea. Jordan has a short coastline on the Gulf of Aqaba, an arm of the Red Sea.

A fertile valley runs along the Jordan River. East of the valley are rocky highlands. Beyond the highlands is a desert, which covers more than 80 percent of Jordan's land. The country is generally dry, with hot summers and cool winters.

Plants and Animals

Banana, date palm, and citrus trees grow in the valley. The highlands have small trees, sagebrush, and grasslands. Few plants grow in the desert.

The animals found in Jordan include wild boars, hares, jackals, foxes, wildcats, hyenas, wolves, mongooses, and gazelles. Birds include golden eagles, vultures, pigeons, and partridges.

People

Most of Jordan's people are Arabs. About a third of the Arabs are Palestinians from Israel and the West Bank.

Most of the people practice Islam. There is also a small number of Christians. Arabic is the main language, but many people also speak English. About three fourths of the people live in cities.

Economy

Unlike some other countries in the Middle East, Jordan does not have much petroleum (oil) or other natural resources. The economy is based on services, including banking, government work, and tourism. Many tourists come to see the biblical cities near the Jordan River.

Manufacturing and mining are also important. Factories produce chemicals, cement, clothing, and food products. The country refines petroleum and mines potash and phosphates, which are used to make fertilizers. Limited farming produces tomatoes, olives, vegetables, and citrus fruits.





Jordan's Queen Rania visits with local children.

History

People have lived in Jordan for more than 200,000 years. Ancient Jordan was part of the area known as Palestine. Early kingdoms—including Ammon, Moab, and Edom—ruled from the 1200s BC.

Assyrians, Babylonians, Persians, Seleucids, and the Roman Empire later controlled the region. In the AD 600s Arab invaders brought Islam to the area. The Ottoman Empire ruled from the 1500s until 1918.

In 1920 Great Britain took control of what is now Jordan. The territory, then called Transjordan, gained full independence in 1946. Abdullah of the Hashimites, a powerful Arab family, became king.

Jordan soon became involved in conflicts with its neighbors. In 1948 the

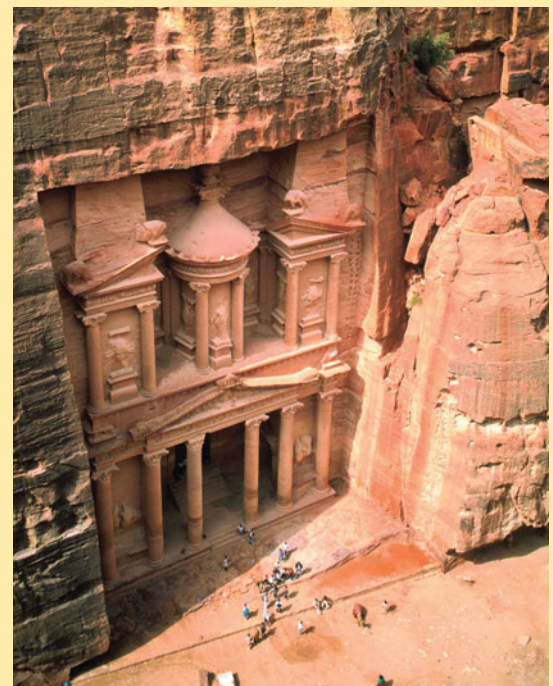
country of Israel was created out of part of Palestine. Jordan joined other Arab nations in a war against Israel. A large number of Palestinians were forced out of Palestine and into Jordan.

In 1967 Jordan fought another war with Israel. Jordan lost the West Bank and the eastern part of Jerusalem to Israel. The losses increased the number of Palestinians who moved to Jordan.

Jordan began moving toward peace and stability in the 1980s. In 1988 Jordan gave up its claims to the West Bank. In 1994 Jordan signed a peace treaty with Israel. In the early 21st century Jordan continued to work for peace in the Middle East.

► More to explore

Amman • Jordan River • Middle East
• Palestine



A large tomb, called the Treasury, was cut into the sandstone cliffs in Petra, Jordan, thousands of years ago.

Facts About JORDAN



Population
(2008 estimate)
5,844,000

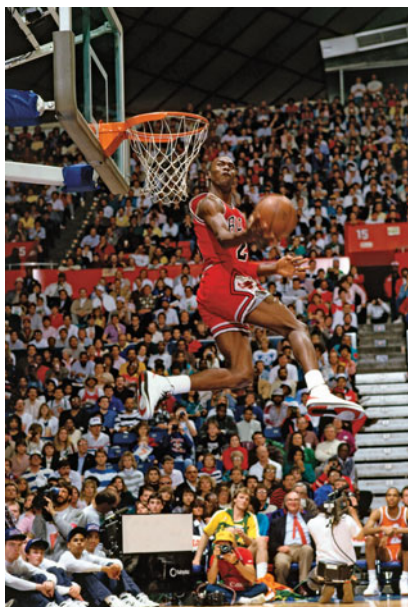
Area
34,495 sq mi
(89,342 sq km)

Capital
Amman

Form of government
Constitutional monarchy

Major cities
Amman,
Az-Zarqa', Irbid,
Ar-Rusayfah,
Wadi Essier,
Al-'Aqabah

Jordan, Michael



Michael Jordan of the Chicago Bulls tries to slam-dunk a ball during an NBA All-Stars competition in 1987.

Michael Jordan was one of the best basketball players of all time. He led the Chicago Bulls to six National Basketball Association (NBA) championships. He was called Air Jordan because of how he soared toward the basket for spectacular slam dunks.

Early Life

Michael Jeffrey Jordan was born on February 17, 1963, in Brooklyn, New York. He grew up in Wilmington, North Carolina. In 1981 he entered the University of North Carolina at Chapel Hill. As a freshman he scored the winning basket in the 1982 college championship game. Jordan was named college basketball player of the year in 1983 and 1984. He left North Carolina after his junior year.

Olympics

Jordan led the U.S. basketball team to a gold medal at the 1984 Summer Olympic games in Los Angeles, California. In 1992 he earned another gold medal at the Summer Olympics in Barcelona, Spain. He and the other U.S. players were called the Dream Team.

Success with the Bulls

Jordan first played for the Bulls in the 1984–85 season. In 1985 he was named Rookie of the Year. With his help the Bulls won the NBA championship three years in a row, from 1991 to 1993. Jordan was named most valuable player (MVP) of each championship series.

Jordan retired from basketball in 1993 to play professional baseball. He returned to the Bulls in March 1995. Again he led the team to three NBA championships in a row, from 1996 to 1998. Jordan was the MVP of each championship series.

Washington Wizards and Retirement

Jordan retired from basketball again in 1999, but in 2001 he returned to the NBA. He played two seasons for the Washington Wizards.

Jordan retired for a third and final time in 2003. His career totals included 32,292 points, 2,514 steals, 5 MVP awards, and 10 scoring titles. He played in 13 NBA All-Star games.

► **More to explore**
Basketball

Did You Know?

Jordan helped the Bulls win 72 games in the 1995–96 season.

Jordan River

The Jordan River, in the Middle East, is the lowest river in the world. It ends in the Dead Sea, at a depth of 1,312 feet (400 meters) below sea level. The river is important to Christians, Jews, and Muslims because of its location in an area that is holy to all three.

The Jordan River is more than 223 miles (360 kilometers) long. It starts on the slopes of Mount Hermon, on the border of Lebanon and Syria. It flows southward through northern Israel to the Sea of Galilee. There the river drops sharply, to 686 feet (209 meters) below sea level.

South of the Sea of Galilee, the Jordan divides Israel and the Israeli-occupied West Bank on the west from Jordan on the east. It flows through a deep, narrow valley with steep sides. Finally it empties into the Dead Sea.

Little rain falls in the Jordan River valley. This makes the river's water very important to farmers in the region. Irrigation systems pump water from the



The distance between the beginning and end of the Jordan River is less than 124 miles (200 kilometers). Because the river winds a lot, however, its length is more than 223 miles (360 kilometers).

Jordan River to farm fields in Jordan and Israel.

► More to explore

Dead Sea • Irrigation • River

Judaism

The religion of the Jewish people is Judaism. Judaism has more than 14 million followers throughout the world, more than a third of whom live in the United States. Many other Jews live in Israel, a country at the eastern edge of the Mediterranean Sea.

Beliefs

Like Christianity and Islam, Judaism teaches that there is only one God and that God created the world. God



Jewish children study the teachings of their religion. Jews sometimes wear skullcaps called yarmulkes.

expressed what he expects of people in the Ten Commandments and other laws.

Jews believe that God chose them to have a special relationship with him. They must devote themselves to God and love one another because God

selected them to bring knowledge of him to the rest of the world. They believe that, in return, God has promised to make the Jews (Israel) a great nation that will eventually draw other nations together in a worldwide community of justice and peace.

The sacred book of Judaism is the Hebrew Bible. Particularly important to Judaism are the first five books, which are known as the Torah. These writings explain and interpret God’s laws. The Talmud is a collection of traditional Jewish laws along with stories and comments about those laws.

Practices

In Judaism the lives of individuals are closely connected to the larger community. The Jewish house of worship, called a synagogue, also serves as a community gathering place. Its leader is known as a rabbi. At the heart of synagogue worship is the public reading of the Torah.

An important time during each week is the Sabbath. Jews observe this period of

Some Important Jewish Holidays		
Holiday	Meaning	Date
Passover	remembrance of the early Jews’ escape from slavery in Egypt	March/April
Purim	celebration of the survival of early Jews living under the rule of the Persians	usually in March
Shavuot	remembrance of the day that God gave the Ten Commandments to Moses	50 days after Passover
Rosh Hashana	Jewish new year	September/October
Yom Kippur	day of asking forgiveness for sins	eight days after Rosh Hashana
Sukkot	festival of thanksgiving	September/October
Hanukkah	celebration of a miracle at the Second Temple of Jerusalem	usually in December
Note: Actual dates depend on the Jewish calendar.		



A Jewish service takes place inside a synagogue.

holiness and rest from sunset on Friday to nightfall on Saturday.

Divisions

Judaism has three main divisions. The most traditional is Orthodox. Orthodox Jews believe that Judaism today should be practiced just as it was in ancient times. In the 1800s two groups broke away. They believed that Judaism should adapt to new situations. Reform Jews made the most changes. They do not participate in all the ceremonies that are observed by Orthodox Jews. Conservative Jews uphold many ancient traditions but have made some changes in their religious practices.

History

Abraham

Judaism is thought to trace back to about 2000 BC. A man named Abraham is considered the founder. According to

the Torah, God told Abraham to leave his home in Mesopotamia (now Iraq) and take his people to Canaan (Palestine). God promised that if Abraham obeyed, he and his offspring would become a great nation in this new land. This is the first covenant, or agreement, that God made with the Jews.

Moses

Long after the days of Abraham, a famine caused the Israelites to move to Egypt. They were later turned into slaves there. After more than 400 years, the Jews were freed from slavery under the leadership of Moses in about the 1200s BC. As instructed by God, Moses led the Israelites back to Canaan. Jews believe that God gave Moses the Ten Commandments and promised that if the Israelites followed these rules, he would look after them.

Rise and Fall of Israel

Over the next several centuries, Israel became a fairly powerful nation in the Middle East, particularly under its first three kings—Saul, David, and Solomon. David conquered Jerusalem and established it as the capital city. His son, Solomon, built the first great Temple of Jerusalem in the 900s BC.

In the 700s BC the Assyrian Empire captured northern Israel. Early in the 500s BC, Babylonians conquered southern Israel, destroyed the Temple, and sent some of the Jews away into slavery. This event marked the beginning of the Diaspora, which means “scattering.” From then on, the Jewish people were no longer together in one place.

Some Jews later returned to their homeland and rebuilt the Temple. But the region remained under the control of one foreign power after another. The Roman Empire took control of the area in the 1st century BC. Jewish revolts against the Roman Empire in the 1st and 2nd centuries AD were unsuccessful. During this period the Romans destroyed the second Temple. Many Jewish people moved away and eventually settled in other countries.

Establishment of Modern Israel

In the late 1800s a movement called Zionism began in Europe. It was named for Mount Zion, a hill in Jerusalem. The Zionists wanted to create a new Jewish country in Palestine. In the early 1900s many Zionists moved to Palestine to escape harsh conditions in Europe. By 1935 the Jewish population in Palestine was about 300,000.

This Jewish immigration increased greatly when Adolf Hitler came to power in Germany in the early 1930s. Hitler and his Nazi Party hated the Jews. First the Nazis made life hard for Jews, and later they decided to kill them. This crime became known as the Holocaust. The Holocaust ended with the defeat of Germany in World War II in 1945. Three years later the modern country of Israel was founded as a homeland for the Jews.

► More to explore

Abraham • Bible • Holocaust • Israel
• Jerusalem • Moses • Palestine
• Synagogue • Talmud • Torah

Juneau



Population
(2000 census)
30,711; (2007
estimate)
30,690

Juneau is the capital of the U.S. state of Alaska. It has the largest area of any U.S. city. The city covers more than 3,000 square miles (8,000 square kilometers).

Juneau lies on the Gastineau Channel, a narrow passage of the Pacific Ocean. The city has no road connections with most of the rest of Alaska. It must be reached by air or water.

Many people in Juneau work for the government. Tourism, fishing, forestry, and mining are also important to the city's economy.

The Juneau area was once a fishing camp of the Tlingit Indians. In 1880 gold was discovered there. Gold miners



Juneau, Alaska, lies at the foot of Mount Roberts and Mount Juneau.

then founded Juneau. For many years the city was the mining center of Alaska. Juneau's gold mine closed in 1944.

Juneau became the capital of Alaska in 1900. In 1959 Alaska became a U.S. state. Juneau was then the state capital.

► More to explore

Alaska

Juniper

Junipers are evergreen trees and shrubs with fragrant wood and flavorful berries. They belong to the cypress family. Some junipers are called cedars, but they are not true cedars. True cedars belong to the pine family.

Junipers are found throughout the northern parts of the world. They grow well in shallow, rocky soil. The roots are often aboveground, and they can curl around boulders and other objects.

Junipers can grow as a low, spreading shrub or as an upright tree. Some trees are as tall as 60 feet (18 meters). The



Juniper berries are used to flavor foods and drinks.

bark is brownish red or gray. The leaves are flat and look like needles. They can be bright green, golden, silvery, or bluish green. Juniper berries can be white, pale green, blue, purple, or black.

Junipers grow very slowly and can live a long time. Some junipers growing in the western United States are estimated to be more than 2,000 years old.

Juniper wood is used to make fence posts, pencils, and storage chests. The berries are used to flavor meats, sauces, and drinks. Oil from junipers is used in perfumes and soaps.

► More to explore

Cedar • Cypress • Tree

Juno

► see Hera.

Jupiter

Jupiter is one of the planets that orbit, or travel around, the sun in the solar system. It is the largest planet in the solar system. In fact, it is bigger than all the other planets put together. Jupiter is the fifth planet from the sun. It travels around the sun at an average distance of about 484 million miles (780 million kilometers).

Physical Features

Jupiter is so huge that it could contain more than 1,000 Earths. Its diameter, or distance through its center, is about 89,000 miles (143,000 kilometers).

Jupiter is a kind of planet called a gas giant. It consists almost entirely of gases, mainly hydrogen and helium. The planet has no solid surface.

Jupiter's clouds appear in colored spots and bright and dark stripes. These markings show the planet's weather patterns. One of the spots is a huge storm called the Great Red Spot. The storm is more than twice as wide as Earth. It has lasted hundreds of years.

Deep inside Jupiter is an area of hot, thick liquid. The planet's center may reach temperatures of 45,000° F (25,000° C).

A system of thin rings surrounds Jupiter. The rings consist of tiny rocks and dust. They are much smaller and dimmer than the planet Saturn's rings.

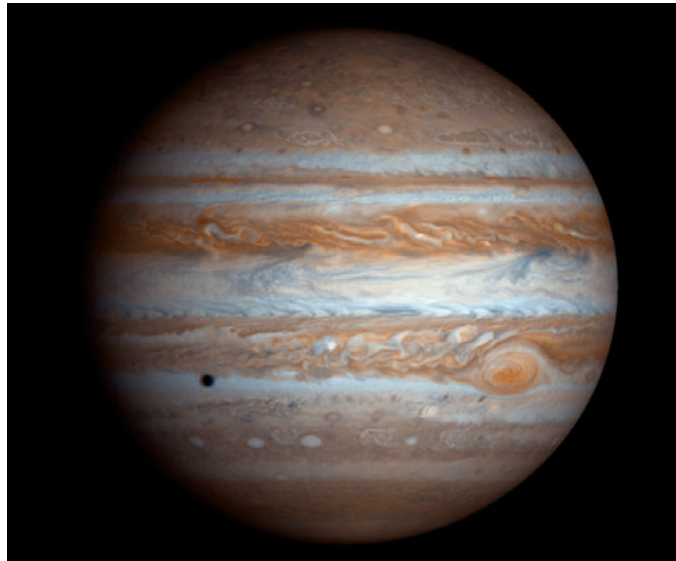
Orbit and Spin

Like all planets, Jupiter has two types of motion: orbit and spin. Jupiter orbits, or travels around, the sun very slowly. It takes about 12 Earth years to complete one orbit. In other words, a year on Jupiter lasts about 12 Earth years.

Jupiter also spins rapidly about its center. The planet takes less than 10 hours to complete one rotation. That is how long a day lasts on Jupiter.

Moons

More than 60 moons orbit Jupiter. Most of them are very small. However, Jupiter has four very large moons: Io, Europa, Callisto, and Ganymede. Ganymede is larger than the planet Mercury.



Though Jupiter appears solid, it is made up mostly of gases.

Observation and Exploration

People have observed Jupiter from Earth since ancient times. Scientists sent the first unmanned spacecraft to the planet in the 1970s. The spacecraft, called Pioneer 10 and 11 and Voyager 1 and 2, flew by the planet and collected information about it.

Later the unmanned U.S. Galileo spacecraft orbited Jupiter. In 1995 it dropped an object called a probe toward the planet. The probe sailed through the upper layers of Jupiter's gases and measured their properties. It was the first man-made object to make contact with a gas giant.

► More to explore

Planets • Solar System • Space Exploration

Jupiter, god

► see Zeus.



The famous Mexican artist Frida Kahlo was seriously injured in a bus crash when she was 18.

(See Kahlo, Frida.)

Some kangaroos stand 6 feet (1.8 meters) tall.

(See Kangaroo.)

U.S. president John F. Kennedy wrote a book called *Profiles in Courage*.

(See Kennedy, John F.)

People flew the first kites about 3,000 years ago.

(See Kite.)

The Koran is the holy book of Islam.

(See Koran.)

The name of the African American holiday Kwanzaa comes from the African language Swahili. It means "first fruits."

(See Kwanzaa.)

Kabul



Population
(2006 estimate)
2,536,300

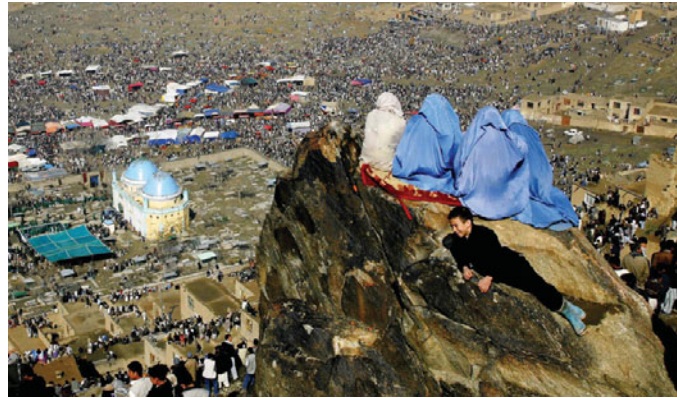
Kabul is the capital of Afghanistan, a country in central Asia. It is Afghanistan's largest city and center of economy. The city's economy, however, was hurt by many years of war.

Kabul has existed for at least 3,500 years. It became an important city long ago because of its location. Kabul lies on the main routes to passes through the country's mountains.

In the early 1500s Kabul was the capital of the Mughal Empire of northern India. In the 1770s Afghanistan became an independent country with Kabul as its capital.

In recent history Kabul has seen much fighting. In the late 1970s and 1980s the city was the site of fighting during a civil war. The Soviet Union also invaded Kabul during that period.

In the 1990s local groups fought each other for control of Kabul. A group called the Taliban took over much of Afghanistan, including Kabul. The Taliban were thought to have helped terrorists who attacked the United States in 2001. In response U.S. forces bombed



In Kabul, Afghanistan, thousands of people gaze down on the Sakhy Shrine. A holy ceremony celebrating the new year is taking place there.

Afghanistan and ended Taliban rule. Kabul was heavily damaged. A new government was later established, and the city began to rebuild.

► More to explore

Afghanistan • Terrorism

Kahlo, Frida

Frida Kahlo was one of the most famous Mexican artists of the 1900s. She was



Frida Kahlo

known especially for her disturbing style and her many unsmiling self-portraits.

The pain Kahlo expressed in her paintings came from her own life. She was born Magdalena Carmen Frida Kahlo y Calderón in Coyoacán, Mexico, on July 6, 1907. She suffered from the disease polio at 6 years old and walked with a limp the rest of her life. At 18 she was nearly killed in a bus crash. Her injuries were so severe that she spent many weeks in the hospital.

Did You Know?

Kahlo often included blood and skulls in her paintings.

Kahlo began painting self-portraits while in the hospital. Once she was well, she showed her paintings to the famous Mexican painter Diego Rivera. Rivera was enthusiastic. He encouraged her and promoted her work to others. Kahlo and Rivera married in 1929. They divorced in 1939 but remarried in 1941.

During her life Kahlo was more famous in the United States and Europe than in her homeland. Since her death, on July 13, 1954, she has become equally famous in Mexico.

► More to explore

Painting • Rivera, Diego

Kalahari

The Kalahari is a desert in Southern Africa. It lies mostly in Botswana. It also covers parts of Namibia and South Africa.

The Kalahari is covered mostly by reddish sand. Hills of sand, called dunes,



are common in the west. Rainfall is rare, and it varies from place to place and from year to year.

Despite the dry climate, the Kalahari has grasses, shrubs, and even some forests. Animal life includes antelope, wildebeests, giraffes, elephants, and cheetahs.

Most of the people of the Kalahari raise cattle and goats. They also grow corn, sorghum, and pumpkins. They get water from underground by digging wells.



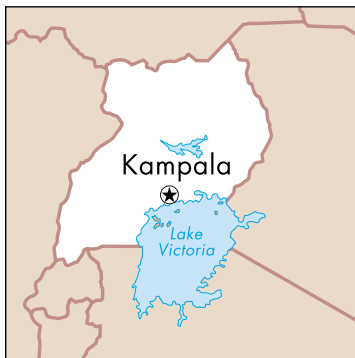
Springbok, a type of antelope, roam through the Kalahari Gemsbok National Park in South Africa.

Some people have always lived in villages. Others, notably the San people, used to live as nomads. They traveled through the desert hunting animals and gathering food. Some San still live as nomads, but today most work on cattle ranches.

► More to explore

Botswana • Desert • Sand Dune

Kampala



Population
(2002 estimate),
metropolitan
area,
1,208,500

Kampala is the capital of the East African country of Uganda. It is the largest city in Uganda by far. The city lies on a series of hills near Lake Victoria.

Kampala is a center of business and transportation. Many people in the city work in government or business offices. Factories in Kampala process foods from Uganda's farms. The factories produce tea, sugar, coffee, and cotton.

The African kingdom of Buganda once controlled the Kampala area. Great Britain took over what is now Uganda in the 1890s. Kampala was then chosen to be the center of British rule in Uganda. The British moved their capital to the city of Entebbe for most of the early 1900s. In

1962 Uganda became an independent country with Kampala as its capital.

► More to explore

Uganda

Kampuchea

► see Cambodia.

Kanem-Bornu Empire

Kanem-Bornu was an empire in Africa. It controlled trade around Lake Chad from the 800s to the 1800s. Its territories included parts of what are now Chad, Cameroon, Nigeria, Niger, and Libya.

Kanem-Bornu handled trade between North Africa and lands to the south. The empire sold such products as salt, elephant tusks, ostrich feathers, and live



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animals. The empire also traded slaves to people in North Africa in exchange for horses. The Kanem-Bornu people raised crops and livestock for their own use.

The Kanem-Bornu Empire was originally known as Kanem. It was probably founded around the mid-800s. Kanem's rulers were members of the Sef family.

Kanem got stronger in the 1100s and 1200s. Then it shrank until little of it was left except for a southern province called Bornu. In the early 1500s Bornu recaptured the rest of Kanem and became Kanem-Bornu. The empire reached its height during the reign of King Idris Alawma. He ruled from about 1571 to 1603.

In 1846 the Sef dynasty died out. Other people then took power for brief periods. By the late 1800s the French, British, and Germans were making their own empires in Africa. They soon divided Kanem-Bornu among themselves.

► More to explore

Chad



A female kangaroo carries her baby in a pouch.

Kangaroos generally have soft, woolly fur. It can be gray, brown, red, or blue-gray. Some species have stripes on the head, back, or upper limbs.

Kangaroos can be 6 feet (1.8 meters) tall and weigh 200 pounds (90 kilograms), though some are much smaller. They have long, powerful back legs that are good for jumping. Their long, thick tails help them balance while jumping. Kangaroos use their short front legs almost like human arms.

A female kangaroo usually has one young, called a joey, each year. Just after birth it crawls into a pouch on the mother's stomach. It feeds on its mother's milk as it grows. Gradually, it learns to hop out and look for food. When it is 7 to 10 months old, the joey leaves the pouch for good.

► More to explore

Marsupial

Did You Know?

Some people in Australia hunt kangaroos for their meat.

Kangaroo

Kangaroos belong to a group of animals called marsupials. These animals carry their young in a pouch. There are more than 50 species, or types, of kangaroo. Some of the smaller species are called wallabies.

Kangaroos live in Australia and nearby areas. Most live in grasslands, but one species lives in trees.

Kansas



Farmers in Kansas grow sunflowers as a crop. Sunflower seeds are used as food. They also contain oil that is used in cooking.

The U.S. state of Kansas is named for the Kansa (or Kaw) tribe of Native Americans who lived along the Kansas River. Because so many wild sunflowers grow in the state, Kansas is nicknamed the Sunflower State. Kansas has been the site of many tornadoes, leading to another nickname—the Cyclone State. The capital is Topeka.

Geography

Kansas sits at the geographical center of the 48 states that lie between the Canadian border and Mexico. Osborne County in Kansas is the center of North America. Kansas is bordered on the north by Nebraska, on the west by Colorado, on the south by Oklahoma, and on the east by Missouri.

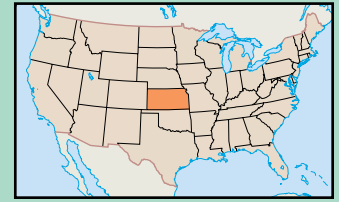
All of Kansas is made up of generally level plains. The land rises slowly and steadily from 700 feet (210 meters) above sea level in the southeast to more

than 4,000 feet (1,200 meters) near the Colorado border in the west. The main rivers are the Kansas in the north and the Arkansas in the south. Kansas has warm summers and cold winters.

People

Whites of European heritage make up the majority of the Kansas population. Hispanic Americans represent about 7 percent of the population, African Americans about 6 percent, and Asians about 2 percent. Almost 25,000 Native Americans live in the state.

The largest city in Kansas is Wichita, located on the Arkansas River in the south-central part of the state. Kansas City sits where the Kansas and Missouri rivers meet. The main public institutions of higher education are the University of Kansas, at Lawrence, with its Medical Center at Kansas City; Kansas State



Facts About KANSAS

Flag



Population

(2000 census)
2,688,418—
rank, 32nd state;
(2008 estimate)
2,802,134—
rank, 33rd state

Capital

Topeka

Area

82,277 sq mi
(213,096 sq
km)—rank, 15th
state

Statehood

January 29,
1861

Motto

*Ad Astra Per
Aspera* (To the
Stars Through
Difficulties)

State bird

Western
meadowlark



State flower

Native sunflower



University, at Manhattan; and Wichita State University, at Wichita.

Economy

The state's leading manufacturing product is transportation equipment, including aircraft and motor vehicles. Kansas farm products have made the processing of foodstuffs another important manufacturing industry. The most valuable farm products are cattle, wheat, and corn. Telecommunications and service industries such as finance, commercial sales, the transportation of goods, and health care are also large parts of the state's economy.

History

The Cheyenne, Pawnee, Kaw, and other Native American groups lived in what is now Kansas before Europeans settled on the land. Spanish explorer Francisco Coronado visited the area in 1541. In 1682 the French explorer Sieur de La Salle claimed the region for his country. The United States acquired the region from France in the Louisiana Purchase of 1803. Kansas was thoroughly explored in the following decades.

The Kansas-Nebraska Act of 1854 created the Kansas Territory and opened it to white settlement. The law left it up to the settlers to decide whether they wanted Kansas to become a free (antislavery) state or a slave state. Slavery supporters established settlements at Atchison and Leavenworth. Antislavery groups founded Topeka and Lawrence. The two sides soon battled, and the fighting earned the territory the name Bleeding Kansas.



The Arkansas River flows through Wichita, Kansas.

Kansas joined the Union in 1861 as a free state. In the years after the American Civil War, Kansas became part of the frontier region called the Old West. Cowboys drove their cattle to such towns as Dodge City and Abilene. After the cattle boom ended in the 1880s, wheat farming became critical to the region. By 1900 most of the farmland had been taken over by settlers.

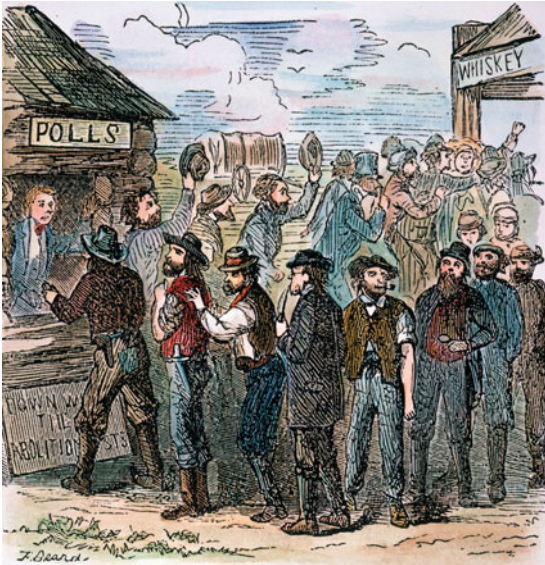
During the 1930s Kansas went through a severe drought. The state became part of what was known as the Dust Bowl as the drought ruined much of the farmland. As a result, many farmers and workers could not make a living. About 80,000 people left the state during this time.

In the 1940s, however, many people came to Kansas to work in the aircraft plants of Wichita. Since the 1940s Kansas has experienced a slow but steady growth in population.

► More to explore

American Civil War • Dust Bowl • Kaw
• Topeka

Kansas-Nebraska Act



An illustration shows men lining up to vote on the issue of slavery in Kansas Territory. In 1855 voters chose to allow slavery.

A law called the Missouri Compromise of 1820 ruled out slavery in the United States north of Missouri's southern border. The Kansas-Nebraska Act of 1854 made it possible again. This angered abolitionists, or people who wanted to end slavery. It led to violence in Kansas, where people fought and killed each other over the issue of slavery. The fighting brought the United States closer to the American Civil War.

The Kansas-Nebraska Act created Kansas and Nebraska as territories. The act allowed the people of each territory to decide whether or not to allow slavery.

Nebraska stayed fairly calm, but Kansas did not. People who supported slavery

poured into Kansas from Missouri. They voted to allow slavery in 1855. Abolitionists came to Kansas from the Northern states. They did not think the vote in favor of slavery was legal. They held their own vote and set up another government.

The town of Lawrence was an abolitionist center. On May 21, 1856, a proslavery mob attacked the town. Three days later abolitionists led by John Brown struck back and killed five men. Over the next few years both sides made many violent attacks. The territory became known as Bleeding Kansas.

The people of Kansas voted against a proslavery constitution in 1858. By this time most of the people were against slavery. Kansas was admitted to the United States as a free state on January 29, 1861.

► More to explore

American Civil War • Brown, John
• Kansas • Nebraska • Slavery

Karakoram Range

The Karakoram Range is a group of mountains in central Asia. They lie northwest of the Himalayan mountain system. Very few people live near the Karakorams. Even so, much of the land is claimed by more than one country. The Karakorams cover parts of Afghanistan, China, India, Pakistan, and Tajikistan.

Did You Know?

K2 is the only one of the Earth's 10 highest mountains that is not in the Himalayas.



The mountain K2 got its name because it was the second peak to be measured in the Karakoram Range. It is also Earth's second-highest mountain.

A Karakoram peak called K2 is the second-highest mountain in the world. K2 is 28,251 feet (8,611 meters) high. It is partly in China and partly in territory that Pakistan controls.

The Karakorams are mostly dry. But the region has glaciers (ice sheets) that feed several rivers, including the Indus River of south Asia

Kathmandu



Population
(2001 census)
671,846

Kathmandu is the capital of Nepal, a country in South Asia. The city lies in a high valley where two rivers meet. It is

surrounded by the Himalaya Mountains. Kathmandu is by far the largest city in Nepal. It is also a cultural center.

There are several famous Buddhist monuments in the Kathmandu valley. One of the most famous is the white-domed Bodhnath Stupa.

Kathmandu is Nepal's center of business and transportation. Tourism is also important to the economy. Factories in the city make such products as processed foods and clothing.

A king founded Kathmandu in 723. At first the city's name was Manju-Patan. Then in the 1500s, another king is said to have built a temple in the city from the wood of a single tree. To honor this event the city was named Kathmandu, meaning "wooden temple." In 1769 a



Durbar Square lies at the center of Kathmandu's historic district. Around the square are temples, monuments, colorful shops, and bustling streets.

ruler united several small kingdoms to form what is now Nepal. He made Kathmandu the capital.

In 1934 an earthquake destroyed many buildings in Kathmandu. The city began to grow rapidly in the late 1900s. Starting in the late 1990s the city was often the site of fighting between government troops and rebels.

► More to explore

Himalayas • Nepal

Kaw

The Kaw are Native Americans who once lived along the Kansas and Saline rivers in what is now Kansas. They are also known as the Kansa or the Konza. Both the state of Kansas and the Kansas River are named after the tribe.

The Kaw lived in villages of cone-shaped lodges that were large enough to house two or three families. They grew corn, beans, and other vegetables. After they were introduced to horses in the early 1700s, the Kaw began to hunt bison (buffalo) on horseback. They used bison skins to make clothing and to cover the tepees they used for shelter while on the hunt.

The Kaw believed that there were mysterious spirits called wakans that could help them in their lives. Kaw boys looked for these spirits while taking part in a ceremony called the vision quest.

The Kaw first lived in eastern North America, along the coast of the Atlantic



A group of Kaw meets with a representative of the U.S. government in the 1800s.

Ocean. They later moved westward along with other related tribes, including the Omaha, the Osage, the Quapaw, and the Ponca.

European explorers began to arrive in Kaw territory in the early 1600s. The settlers carried new diseases, such as smallpox, that killed many of the Kaw. The settlers also wanted the Kaw's land. By the mid-1800s the Kaw had signed agreements that gave most of their territory to the U.S. government. The Kaw moved to a reservation in what is now Kansas. In 1873 they moved to a reservation in Indian Territory (now Oklahoma). In the early 20th century, the reservation was divided into small, privately owned pieces of land.

By the end of the 20th century there were about 1,000 Kaw. Most lived in Oklahoma.

► More to explore

Native Americans • Omaha • Osage
• Ponca • Quapaw



Kazakhstan

The largest nation in central Asia is Kazakhstan. It is named for the Kazakhs, a people who once roamed the region's vast grasslands. The capital is Astana.

Kazakhstan shares borders with Russia, China, Kyrgyzstan, Uzbekistan, and Turkmenistan. The Tian Shan mountain range lies along the border with China. Much of the south and center is desert.

Grasses and shrubs grow on the plains and in the desert. Antelope and elk live on the plains. Wolves, bears, snow leopards, and saiga (a hoofed animal) live in the hills.

The Kazakhs, a Muslim people, make up more than half of the population. About one third of the people are Russians. Other ethnic groups include Ukrainians, Uzbeks, Germans, and Tatars. The main languages are Kazakh and Russian.



Young women dressed in traditional clothing and fur hats attend a ceremony in Astana, Kazakhstan.

Kazakhstan's economy is based on its petroleum (oil) and natural gas. Kazakhstan also mines iron ore, copper, zinc, and gold. Its industries produce iron and steel, food products, and machinery. Farmers raise wheat, vegetables, cotton, and livestock.

Over the centuries the Mongols and others ruled parts of Kazakhstan. In the 1400s many Uzbeks arrived. They lived as nomads, or wanderers, and became known as Kazakhs. The Kazakhs soon ruled an empire in central Asia.

By 1848 Russia controlled the Kazakhs' land. In 1920 Kazakhstan became part of the Soviet Union. After the Soviet Union collapsed Kazakhstan declared its independence in 1991.

► More to explore

Astana • Union of Soviet Socialist Republics • Uzbekistan

Facts About KAZAKHSTAN



Population
(2008 estimate)
15,655,000

Area
1,052,090 sq mi
(2,724,900 sq km)

Capital
Astana

Form of government
Republic

Major cities
Almaty,
Qaraghandy (Karaganda),
Shymkent (Chimkent),
Taraz, Astana



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Keller, Helen



Helen Keller

Helen Keller was both blind and deaf. But despite these disabilities, she became a skilled writer and speaker.

Helen Adams Keller was born on June 27, 1880, in Tuscumbia, Alabama. When she was 19 months old, she got very sick. The disease left her unable to see or hear.

When Helen was 6, she got a teacher named Anne Sullivan. Sullivan used Helen's sense of touch to teach her. She handed Helen a doll. Then she traced the letters of the word doll on the palm of Helen's hand. Helen guessed the connection between the letters and the object she was holding. She learned that things had names.

With Sullivan's help, Helen made rapid progress. Soon she could read sentences by feeling raised words on cardboard. A few years later she learned Braille. Braille is a special system of writing for the

blind that uses raised dots instead of printed words. People read Braille with their fingertips.

Learning to speak was a bigger challenge. Helen did it by touching the lips and throat of a person who was speaking. She was able to feel the way the lips moved and the throat vibrated. At the same time someone spelled out the words that were being spoken.

Keller graduated from Radcliffe College in 1904. Then she wrote magazine articles and books about blindness.

Keller also gave many speeches. Some people had trouble understanding her, so she took along another person who repeated her words. Keller died in Westport, Connecticut, on June 1, 1968.

► More to explore

Blindness • Braille • Deafness



Helen Keller touches the face of Anne Sullivan, her remarkable teacher. Keller learned to speak partly by feeling how people's lips move when they talk.

Kennedy, John F.



John F. Kennedy was the 35th president of the United States.

John F. Kennedy was the 35th president of the United States. He was the youngest person ever elected to the presidency. Kennedy was a very popular leader. His assassination in 1963 shocked the country and the world.

Early Life

John Fitzgerald Kennedy was born on May 29, 1917, in Brookline, Massachusetts. He was the second of nine children born to Joseph and Rose Kennedy. Both his grandfathers had been in state politics. His father held government posts under President Franklin D. Roosevelt.

In 1940 Kennedy graduated from Harvard University. During World War II he joined the U.S. Navy. He commanded a torpedo boat in the Pacific Ocean. It was sunk by a Japanese destroyer. Although

he was seriously hurt, Kennedy led his crew to safety. For this he earned a medal for heroism.

Political Career

In 1946 Massachusetts voters elected Kennedy, a Democrat, to the U.S. House of Representatives. In 1952 Kennedy was elected to the U.S. Senate. During his two terms he fought for labor reform and civil rights. While he was a senator Kennedy married Jacqueline Lee Bouvier. They had two children. He also published the book *Profiles in Courage* (1956), about great U.S. leaders.

Presidency

Kennedy ran for president in the 1960 election. He defeated his Republican opponent, Richard M. Nixon. In his speech on the day he took office Kennedy asked citizens to help make the United States a better place. He said, “Ask not what your country can do for you—ask what you can do for your country.”

Kennedy took office during the Cold War, a time of tension between the United States and the Soviet Union, a Communist nation. He promised to stop the spread of Communism. He sent military advisers, money, and supplies to fight Communists in Vietnam. In 1961 he supported rebels who wanted to overthrow the Communist government of Cuba. The rebels’ invasion at the Bay of Pigs in Cuba failed, however.

A serious crisis of the Cold War took place in October 1962. The United



TIMELINE

Kennedy is born in Brookline, Massachusetts.

May 29, 1917

A U.S.-backed invasion of Cuba at the Bay of Pigs fails.

1961

Cuban missile crisis almost leads to nuclear war.

1962

Kennedy is assassinated in Dallas, Texas.

November 22, 1963

Kennedy is elected president.

1960

Congress approves the Peace Corps.

1961

Agreement to end most testing of nuclear weapons is signed.

1963

States discovered that the Soviet Union was building nuclear missile bases in Cuba, which is very close to the U.S. state of Florida. Kennedy saw this as a threat to the United States. He ordered U.S. warships to Cuba. For 13 days nuclear war seemed near. Finally the Soviets agreed to remove the weapons. The next year the United States, the Soviet Union, and Great Britain signed the Nuclear Test-Ban Treaty. It banned most nuclear testing.

Meanwhile, Kennedy proposed programs to help people both at home and in other countries. He sought to lower unemployment, provide medical care for the aged, reduce taxes, and protect civil rights. Kennedy also supported exploration of the moon. Congress approved several of his projects, including the Peace Corps, a volunteer service to help other countries in their development efforts. Other plans did not pass until after Kennedy's death.

Assassination

During his campaign for reelection, Kennedy visited Dallas, Texas, on November 22, 1963. He and his wife were riding through the city in an open car when shots rang out. Bullets hit the president in the neck and the head. He died shortly after he was brought to the hospital. Within hours Vice President Lyndon B. Johnson was sworn in as president.

Police arrested Lee Harvey Oswald for the shooting. Jack Ruby, a nightclub owner, killed Oswald before he could go on trial. Some people thought that a secret group had planned Kennedy's assassination. Johnson ordered an investigation. The Warren Commission was formed to examine the evidence. It decided that Oswald had acted alone.

► More to explore

Civil Rights • Cold War • Johnson, Lyndon B. • Nixon, Richard M. • Peace Corps • United States



Kentucky

In 1792 Kentucky became the first U.S. territory west of the Appalachian Mountains to gain statehood. The capital of Kentucky is Frankfort.

The state probably took its name from a Native American word meaning “meadowland” or “prairie.” Kentucky is nicknamed the Bluegrass State after the bluish green grass that grows in many parts of the state. It is known for its Thoroughbred horses and the Kentucky Derby, a very popular horse race held each year.

Geography

Kentucky is located in the south-central part of the United States. The Ohio River separates northern Kentucky from Ohio, Indiana, and Illinois. The Tug River and the Big Sandy River run between Kentucky and West Virginia on the east and northeast. Virginia borders Kentucky to the southeast, and Tennessee lies to the south. In the west the Mississippi River forms the boundary between Kentucky and Missouri.



Louisville is the largest metropolitan area in the U.S. state of Kentucky. It lies on the Ohio River.

In the east are the Appalachian Mountains, including the Cumberland and Pine ranges. Between the eastern mountains and the Tennessee River in the west is a large area of lowlands. The westernmost part of the state is an area of flat plains. It is part of the great lowland region that extends north from the Gulf of Mexico. Kentucky has cool winters and warm summers.

People

The majority of Kentucky’s population consists of whites of European descent. African Americans make up about 7 percent of the state’s population. Kentucky remains a largely rural state of small towns. The only cities with populations greater than 100,000 are Lexington and Louisville.

Economy

Manufacturing and service industries are the main sources of income and

employment in Kentucky. The major manufactured products include motor vehicles and parts, foodstuffs, fabricated metal products, and electronic equipment.

Tobacco has long been a major cash crop. The state ranks first in the nation in the breeding of racehorses. Broiler chickens and cattle are the most valuable farm animals. Kentucky is one of the major producers of coal in the nation.

History

The area that is now Kentucky was inhabited by the Shawnee, Iroquois, and Cherokee Indians when Europeans first arrived. For many years the American colonists could not expand westward into the region because they were blocked by mountain ranges. This situation changed in 1750 when the Cumberland Gap—a pass through the Cumberland Mountains—was discovered. In the 1770s the frontiersman Daniel Boone helped create a trail that allowed other pioneers to enter the territory.

The first permanent white settlement in what is now Kentucky was founded in 1774. The next year Boone founded a settlement at what is now Boonesboro. At first the region was made a part of the colony of Virginia. In the 1780s, however, Kentuckians began to call for the separation of their territory from Virginia. Success came in 1792, when Kentucky joined the Union as the 15th state.

During the American Civil War, Kentucky was one of the border states that lay between the North and South. Abraham Lincoln, president of the United States during the war, and Jefferson Davis, president of the Confederacy, were both born in the state. Although the state never withdrew from the Union, many Kentuckians fought for the Confederacy.

The economy of Kentucky grew steadily in the late 1800s. The introduction of tobacco farming brought much money into the state. Coal mining on a large scale began in the 1870s. Bloody clashes between miners and operators took place in the 1930s. In later decades mining machinery reduced the need for miners. Manufacturing businesses became increasingly important in the latter part of the century. In the early 21st century, manufacturing still represented a significant part of Kentucky's economy.

► More to explore

American Civil War • Boone, Daniel
• Cumberland Gap • Frankfort

Facts About KENTUCKY

Flag



Population

(2000 census)
4,041,769—
rank, 25th state;
(2008 estimate)
4,269,245—
rank, 26th state

Capital

Frankfort

Area

40,409 sq mi
(104,659 sq
km)—rank, 37th
state

Statehood

June 1, 1792

Motto

United We Stand,
Divided We Fall

State bird

Cardinal



State flower

Goldenrod



Horses graze in a grassy pasture on a horse farm in Lexington, Kentucky.



Kenya

Kenya, a country in East Africa, is a land of natural beauty. Many visitors come to Kenya to see its scenery and its rare wild animals. Kenya's capital is Nairobi.

Geography

Kenya lies along the equator on Africa's east coast. Kenya touches Tanzania, Uganda, Sudan, Ethiopia, and Somalia. Lake Victoria lies in the west. The Indian Ocean is to the east.

Highlands rise in the western part of Kenya. The Great Rift Valley divides the highlands. Mount Kenya, at 17,058 feet (5,199 meters), is Kenya's highest peak. It lies in the center of the country. East of the highlands, the land slopes down toward the coast.

Kenya's most important river, the Tana, flows from the highlands to the Indian Ocean. Most of the country's other rivers are short and shallow. They some-



Workers dry coffee on racks in Nyeri, Kenya.

times dry up when there is little rainfall. The Great Rift Valley has many lakes.

Kenya has two wet seasons and two dry seasons. The highlands and the coast receive the most rain. The north is Kenya's driest area. Temperatures are generally warmer in the north and cooler in the highlands.

Plants and Animals

Evergreen forests and bamboo grow in the highlands. East and west of the highlands, low trees grow among grass. Thorn bushes and baobab trees dot the dry landscape of the north. The coast is mainly grassland with some forests.

Some of the rarest wildlife in the world lives in Kenya. The country's animals include elephants, rhinoceroses, lions, leopards, giraffes, wildebeests, zebras, impalas, hyenas, hippos, and crocodiles. Many national parks and game reserves protect the wildlife.





Impalas graze in Nairobi National Park in Kenya.

People

The people of Kenya belong to many different ethnic groups. The largest groups are the Kikuyu, the Luhya, the Luo, the Kalenjin, and the Kamba. There are also groups of nomads, or wanderers, such as the Masai. Each group has its own language and culture. Most people also speak English or Swahili as a second language.

The most common religion is Christianity. Smaller groups of people follow Islam or traditional African religions.

Most Kenyans live in rural areas, but cities have grown rapidly since the early 1970s. Nairobi is the largest city.

Economy

Most Kenyans are farmers who grow crops for their families. Corn is the main food crop. Kenya also grows tea, flowers, and coffee to sell to other countries.

Manufacturers make flour from grains and sugar from sugarcane. They also

produce beverages, petroleum (oil) products, cloth, paper, cement, and leather.

Tourism is an important part of Kenya's economy. Many tourists visit Kenya to see its wildlife or to visit its beautiful beaches.

History

For centuries African people along Kenya's coast traded with Arabs from across the Indian Ocean. Europeans arrived in the area in the 1800s. By the 1890s the British had taken control of Kenya. They made it a British colony in 1920.

The British encouraged white people from Great Britain and South Africa to settle in Kenya. The British set aside much of the colony's land for whites. As a result, the native people of Kenya grew angry at the British. In 1952 they began a rebellion. A group called the Mau Mau led the struggle. The British stopped the Mau Mau rebellion in 1960. But the people of Kenya continued to push for freedom. Kenya became an independent country in 1963.

After independence, Kenya had a strong government. It banned political parties that disagreed with it. Other countries criticized the government's actions. In 1992 Kenya held its first elections since the 1960s with candidates from more than one political party. After that, Kenya's government improved.

► **More to explore**
Nairobi

Facts About KENYA



Population
(2008 estimate)
37,954,000

Area
224,961 sq mi
(582,646 sq km)

Capital
Nairobi

Form of government
Republic

Major cities
Nairobi, Mombasa, Kisumu, Nakuru, Eldoret, Machacos

Key, Francis Scott

Many citizens of the United States know the words to the most famous song written by Francis Scott Key, “The Star-Spangled Banner.” Key wrote the song during the War of 1812. It later became the U.S. national anthem.

Key was born in western Maryland on August 1, 1779. He studied at home until age 10. He then went to school in Annapolis. Later he studied law at St. John’s College. After graduating, Key set up a law practice in Georgetown, in what is now Washington, D.C.

In August 1814, during the War of 1812 between the United States and Great Britain, the British set fire to the Capitol and other buildings in Washington,

D.C. Afterward they captured a friend of Key’s named William Beanes. As a lawyer, Key went to ask the British to free Beanes. The British agreed but held both men on a ship overnight.

During the night Key watched the British attack Fort McHenry, which guarded Baltimore, Maryland. At dawn Key saw the U.S. flag still flying over the fort. It had not fallen to the British. Relieved, Key began to write a poem about the battle.

Key published the poem under the title “Defence of Fort M’Henry.” People soon began singing the poem to the tune of an English drinking song, “To Anacreon in Heaven.” The song, now called “The Star-Spangled Banner,” became popular across the country. The U.S. Army and Navy later used it as their anthem.

In 1833 Key became an attorney for the District of Columbia. He also kept writing. He published *The Power of Literature and Its Connection with Religion* in 1834. *Poems* appeared in 1857, long after Key’s death in Baltimore on January 11, 1843. In 1931 the U.S. Congress made “The Star-Spangled Banner” the national anthem.

► More to explore

National Anthem • War of 1812



The first printed sheet music of Francis Scott Key’s “The Star-Spangled Banner” appeared in 1814.

Keys, Florida

► see Florida Keys.

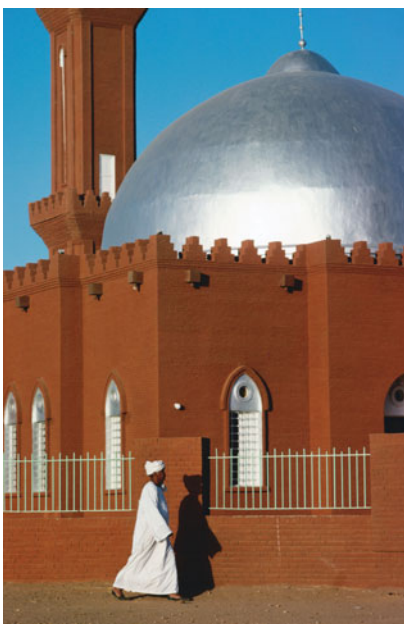
Khartoum



Population
(1993 census),
city, 947,483;
(2008
estimate), urban
area,
8,000,000

Khartoum is the capital of Sudan, a country in northeastern Africa. The city lies where the Blue and White Nile rivers meet to form the main stream of the Nile River. Two other cities, Omdurman and North Khartoum, lie just across the rivers. Omdurman is the largest city in Sudan. It is also the place where the country's lawmakers meet.

Khartoum is Sudan's center of transportation and trade. Many people in the city work for the government.



A man walks past a mosque in Khartoum, Sudan.

Factories there make cotton cloth and other products.

Khartoum began in 1821 as an Egyptian army camp. It soon grew into a town. Egypt and Great Britain shared control of the area.

In the 1880s local Muslim forces rebelled against foreign rule. They captured Khartoum in 1885. British and Egyptian troops took back the city in 1898. Khartoum was the center of British and Egyptian rule of Sudan until 1956. In that year Sudan became an independent country with Khartoum as its capital.

► More to explore

Nile River • Sudan

Did You Know?

"Khartoum" means "elephant's trunk" in the Arabic language.

Khwarizmi, Al-

Al-Khwarizmi was an Arab mathematician and astronomer of the AD 800s. He is known as the Father of Algebra.

Muhammad ibn Musa al-Khwarizmi was born in about 780. Historians believe that either he or his ancestors came from Khwarezm, a region in central Asia. The region is now part of the countries called Turkmenistan and Uzbekistan.

As an adult al-Khwarizmi lived in Baghdad, in what is now Iraq. There he worked at the House of Wisdom, a center for scientific research. Al-Khwarizmi studied the works of Arab, Greek, and Indian scholars.



A postage stamp honors the mathematician known as Al-Khwarizmi.

Al-Khwarizmi invented new ways to solve mathematical problems. One of the books he wrote explained a problem-solving system that is now known as algebra. The word algebra comes from the Arabic word *al-jabr*, which appears in the title of al-Khwarizmi's book. European universities used the book to teach mathematics from the 1100s to the 1500s.

Another one of al-Khwarizmi's books introduced Arabic numerals to Europe. Arabic numerals are the 10 digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) that most people use today.

Al-Khwarizmi was interested in more than mathematics. He also wrote important books on astronomy and geography. He died in about 850.

► More to explore

Numbers and Number Systems

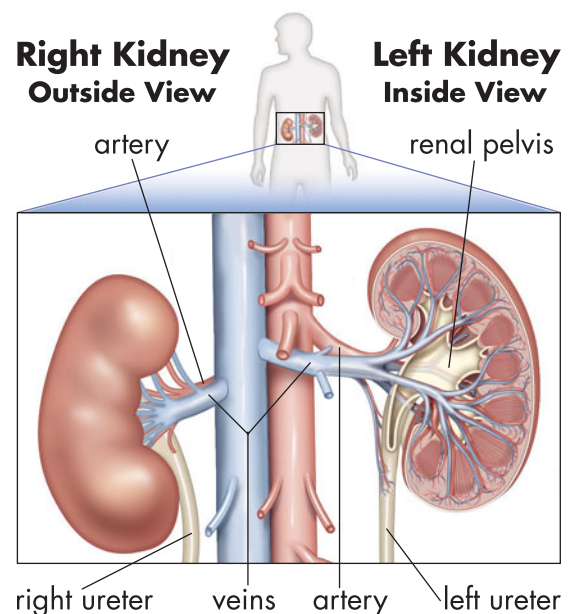
Kidney

All living things must remove wastes from their bodies. Reptiles, birds, mammals, and some other animals remove some of these wastes through two body parts called kidneys. Kidneys are part of the urinary system. They take out extra water and wastes from the blood. These wastes leave the body in the form of urine.

Structure

Human kidneys are reddish brown and shaped like beans. They sit in the lower back, one on each side of the backbone. Each kidney is about 4 to 5 inches (10 to 12.5 centimeters) long.

The inner curve of the kidney has a dent in the middle called the hilus. The hilus is the point where blood vessels enter and leave the kidney. These blood vessels include a renal artery and a renal vein. The word renal means “kidney” in the Latin language. Blood enters the kidney



through the renal artery and leaves through the renal vein.

Also at the hilus is a funnel-shaped structure called the renal pelvis. The renal pelvis is a hollow area that collects urine. A tube called the ureter leads from the renal pelvis out of the kidney. The ureter runs down to the bladder.

Blood flows through the kidneys in tiny blood vessels called capillaries. The capillaries lead to tiny tubes called nephrons, which make urine. Each kidney has at least a million nephrons.

How Kidneys Work

Every few minutes all the blood in the body runs through the kidneys. The nephrons remove water and some substances from the blood. Some of these substances are waste. Others are nutrients, or things that are useful to the body. The nephrons pass the nutrients and most of the water back into the blood. The wastes and the extra water stay in the nephrons. This liquid is the urine. Drop by drop, the urine passes from the nephrons into the renal pelvis. From there it goes into the bladder, which stores the urine until it leaves the body.

Sometimes wastes, especially salts, remain in the kidneys. These salts can form hard lumps called kidney stones. Medicines can help to dissolve these stones.

► More to explore

Blood • Urinary System

Kiev



Population
(2006 estimate)
2,718,000

Kiev is the capital of the country of Ukraine. It is one of the largest cities in eastern Europe. Kiev has a port on the Dnieper River. The city is Ukraine's center of culture and business.

The economy of Kiev depends on trade, industry, and businesses that provide services. Many people in Kiev work in government or business offices. Other people work in publishing, engineering, or manufacturing. Factories in Kiev make tools, electronics, chemicals, foods, and other goods.

Kiev was founded several hundred years ago. In the late 800s Vikings from



The Church of Saint Andrew, in Kiev, Ukraine, was built in the 1700s. It is known for its five green and gold domes.

northern Europe took over the area. They made Kiev the capital of their kingdom, called Kievan Rus. The city grew into a center of trade, culture, and politics. A Mongol army destroyed Kiev in 1240. The city was later rebuilt.

In the late 1700s Russia took control of the area. Kiev became the center of a movement to gain independence for Ukraine.

The Soviet Union took over Ukraine in the 1920s. In the 1940s, during World War II, German and Soviet troops fought in Kiev. Large sections of the city were destroyed. The Germans killed many residents of Kiev, mainly Jews.

After the war Kiev again became a center of industry and culture. In 1991 Ukraine became an independent country with Kiev as its capital.

► More to explore

Ukraine • Union of Soviet Socialist Republics • World War II

Kigali



Population
(2003 estimate)
656,200

Kigali is the capital of Rwanda, a country in east-central Africa. It is a hilly city



An open-air market in Kigali, Rwanda, offers fruits and vegetables for sale.

more than 5,000 feet (1,500 meters) above sea level. Kigali lies on the Ruganwa River. It is the largest city in Rwanda by far.

The economy of Kigali is based mainly on trade. Factories in the city process tin and foods. Other factories make shoes, clothing, and chemicals.

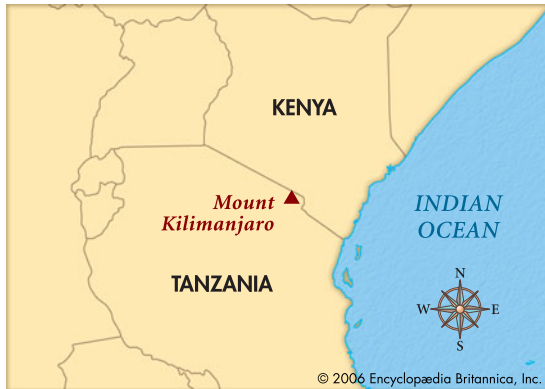
In the early 1900s Kigali was part of Germany's colonies in East Africa. Belgium took control of the region in 1919. In 1962 Rwanda became an independent country with Kigali as its capital.

Rwanda's two main ethnic groups, the Hutu and the Tutsi, have a long history of conflict. In 1994 groups of Hutu killed hundreds of thousands of Tutsi in Kigali and elsewhere in the country.

► More to explore

Rwanda

Kilimanjaro, Mount



Located in northeastern Tanzania, Mount Kilimanjaro is the highest point in Africa. Though it lies in the tropics, its peak is covered with ice and snow year-round.

Mount Kilimanjaro is made up of three inactive volcanoes. Kibo is in the center, Mawensi is to the east, and Shira is to the west. Kibo is the highest peak, reaching a height of 19,340 feet (5,895 meters). Mawensi rises to 16,893 feet (5,149 meters). Shira is 13,000 feet (3,962 meters) high. Parts of the lower

slopes are densely forested. Elephants, buffalo, monkeys, and oxlike antelope called eland live in the forests.

People live only on the lower slopes. They grow bananas, millet, and coffee and raise cattle. On the southern and eastern slopes, the Chaga people have developed an irrigation system for watering their crops.

Europeans learned of Kilimanjaro when German missionaries spotted it in 1848. Climbers first reached Kibo's peak in 1889. Today thousands of hikers try to climb Kibo each year. The town of Moshi, at the southern foot of the mountain, is a base for climbers.

► More to explore

Tanzania • Volcano

King, Martin Luther, Jr.

Martin Luther King, Jr., led the civil rights movement in the United States. He used nonviolent, or peaceful, protest to get equal rights for African Americans. He was awarded the Nobel peace prize in 1964.

Early Life

King was born in Atlanta, Georgia, on January 15, 1929. His father was a Baptist minister. At age 15 Martin entered Morehouse College in Atlanta. He graduated in 1948.

King studied for three years at a seminary (school for ministers) in Pennsylv-

Did You Know?

King learned nonviolent methods partly from the example of Mahatma Gandhi of India.



Mount Kilimanjaro extends nearly 50 miles (80 kilometers) from east to west.



Civil rights leader Martin Luther King, Jr., is pictured giving a speech after leading a march in Selma, Alabama.

nia. There he learned about nonviolent protest. King later received a degree from Boston University in Massachusetts in 1955. While in Boston he met Coretta Scott. They married in 1953 and had four children.

Civil Rights Movement

In 1954 King became pastor of a Baptist church in Montgomery, Alabama. In December 1955 an African American woman named Rosa Parks refused to give her seat on a Montgomery bus to a white man. She was arrested for breaking a segregation law. Such laws were meant to keep blacks and whites separate. To protest her arrest, King encouraged African Americans not to ride city buses. This was called the Montgomery bus boycott. The boycott was successful. In 1956 the U.S. Supreme Court banned racial segregation on public transportation.

In 1958 King organized a group called the Southern Christian Leadership Conference (SCLC). The SCLC led many nonviolent protests against segregation.

In August 1963 King and other leaders brought together about 250,000 people for a gathering called the March on Washington. Here King delivered his famous “I Have a Dream” speech.

King’s actions helped get the Civil Rights Act of 1964 passed. In 1965 King led a march in Selma, Alabama, in support of African American voting rights. Soon the Voting Rights Act of 1965 was passed.

Final Years

In 1966 King turned to other problems. He fought racism in Northern cities and spoke out against the Vietnam War. He planned a Poor People’s March to Washington, D.C.

In 1968 King went to Memphis, Tennessee, to help city workers who were on strike. On April 4 a white man shot and killed him. King was only 39 years old.

King’s reputation grew after his death. In 1986 the United States set aside the third Monday in January as a holiday to honor him.

► More to explore

African Americans • Civil Rights Movement • Parks, Rosa

King Arthur

► see Arthur, King

Kingfisher



A kingfisher sits on a twig.

Kingfishers are brightly colored birds that often fish for their food. There are about 90 kinds of kingfisher throughout the world. Most of these live in warm regions near rivers or lakes.

Kingfishers have plump bodies that are about 4 to 18 inches (10 to 46 centimeters) long. Their feathers come in many colors. Many kingfishers have blue feathers on their back and reddish or white feathers on their belly. Some have a crest, or tuft of upright feathers, on top of their head. A kingfisher's short tail allows the bird to turn easily when it is underwater. The daggerlike bill is useful for spearing fish, insects, and other food.

Kingfishers hunt for fish by swooping down and diving into the water. Sometimes they hunt on land for lizards and insects. Kingfishers are also known for chasing and attacking each other in the air.

Kingfishers spend their time alone until it is time to mate. During the mating season, the birds pair up to build nests for their eggs. They make nests in the hollows of trees or dig tunnels in banks of earth. After the eggs hatch, the parents raise their young together. When the babies are old enough, the parents go off on their own again. Kingfishers can live as long as 15 years.

► More to explore

Bird

King Philip's War

In King Philip's War Native Americans tried to stop the settlers of New England from taking their land. They fought well but lost the war. After it ended, the English settlers felt free to take even more land.

Metacom, called King Philip by the English, was grand sachem (chief) of the Wampanoag people. The Wampanoag lived in what are now the U.S. states of



An illustration shows English settlers attacking Native Americans in 1675, during King Philip's War.

Did You Know?

About 12 white settlements were destroyed in King Philip's War.

Rhode Island and Massachusetts. Metacom and the neighboring English settlers did not trust each other. In 1671 the English demanded that the Wampanoag surrender their guns. Metacom then became convinced his people could no longer live side by side with the English. He persuaded the Nipmuc and other Native American tribes to help him fight the settlers.

In 1675 three Wampanoag men killed a Native American for helping settlers. Settlers then killed the three men. These events set off the war. It spread over much of New England. Settlers and Native Americans destroyed each other's villages.

In the spring of 1676 the Native Americans ran short of food. The winter had been harsh and the fighting had kept them from attending to their crops. Nevertheless, Metacom kept on fighting. He was killed in August 1676. Some fighting continued after that. However, it was clear that the settlers had won.

King Philip's War was the biggest war in New England during the 1600s. Native Americans attacked more than half of New England's 90 settlements. In addition, about 3,000 Native Americans and 600 English settlers died. After the war, the weakened Native Americans of southern New England were no longer able to stop the English from taking over their lands.

► **More to explore**

Metacom • Wampanoag

Kingston



Population
(2001 census),
city, 96,052;
(2006
estimate), urban
area, 585,300

Kingston is the capital of Jamaica, an island country in the Caribbean Sea. The city lies along a scenic natural harbor on the island's coast.

Kingston is Jamaica's main port and center of business. The city has a busy shipping industry. It is also a major tourist center. In addition, many people in Kingston work for the government.

Kingston was founded in 1692. In that year an earthquake destroyed the town of Port Royal. The people who survived the earthquake built Kingston nearby. The city grew quickly, mainly because of its harbor.



Devon House in Kingston was the home of one of the few black millionaires in Jamaica in the 1800s.

Great Britain ruled Jamaica for many years. The British made Kingston their capital on the island in 1872. The city survived several fires and, in 1907, a violent earthquake.

In 1962 Jamaica became an independent country. Kingston remained the capital.

► More to explore

Jamaica

Kingstown



Population
(2006 estimate)
18,200

Kingstown is the capital of Saint Vincent and the Grenadines, an island country in the Caribbean Sea. The city is located on the coast of Saint Vincent, the country's largest island. It is the main market and port in the country.

Kingstown has the oldest botanical gardens in the Western Hemisphere. They were created in the 1760s. The city also has a fort and several churches from the 1800s.

People have lived on Saint Vincent Island for hundreds of years. Great Britain took control of the island as well as the nearby Grenadines in the 1700s. In 1979 Saint Vincent and the Grenadines

became an independent country. Kingstown became the country's capital.

► More to explore

Saint Vincent and the Grenadines

Kinshasa



Population
(1998 estimate), city,
4,787,000;
(2004 estimate), urban
area,
7,273,950

Kinshasa is the capital of the Democratic Republic of the Congo, a country in central Africa. It is one of Africa's largest cities. Kinshasa is a center of education and culture.

Kinshasa is a major port on the Congo River. Much of the Democratic Republic of the Congo's business and industry is based in the city. Factories there make



A tailor sews in his shop in Kinshasa, Democratic Republic of the Congo.

Did You Know?

Directly across the Congo River from Kinshasa is Brazzaville. Brazzaville is the capital city of the Republic of the Congo.

fabrics and process foods, drinks, and chemicals.

People have lived along the Congo River for thousands of years. In 1881 the explorer Sir Henry Morton Stanley established a trading post there. He named it Léopoldville after King Léopold II of Belgium.

Belgium soon took over the area. Léopoldville grew into a town. In 1923 it became the capital of a colony called the Belgian Congo. The country became independent in 1960. Léopoldville was its capital. The city was renamed Kinshasa in 1966.

Some of the Democratic Republic of the Congo's government offices were moved to the city of Lubumbashi in 2000. Kinshasa remained the home of the country's president.

► More to explore

Congo, Democratic Republic of the

Kiowa

The Kiowa are a Native American people who probably first lived in what is now Montana. In the 1700s they moved to the Great Plains. The Kiowa were powerful warriors. They defended their land from U.S. settlers and troops longer than most other Plains Indian tribes did.

After arriving on the plains the Kiowa were introduced to horses. On horseback Kiowa hunters followed roaming herds of bison (buffalo). Bison meat



Elk Tongue of the Kiowa poses with his daughter in about 1891.

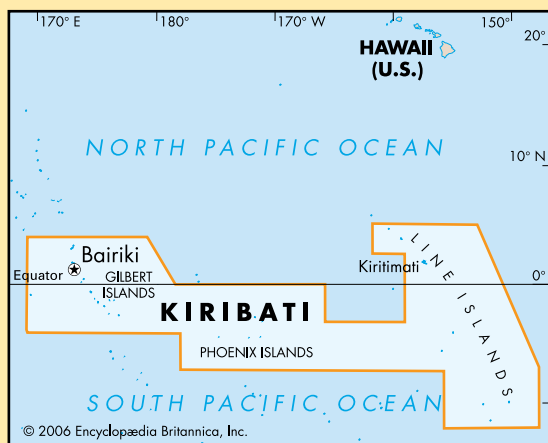
became their major source of food. They used bison hides to make clothing and covers for their tepees. The Kiowa did not farm.

The Kiowa formed alliances with other Native American tribes. The Kiowa and their allies attacked travelers, traders, and settlers who entered their lands. They also raided settlements in Texas and Mexico. But U.S. settlers started taking over Kiowa land anyway. In 1867 some Kiowa leaders agreed to give up all their land except for a small reservation in what is now Oklahoma. Many Kiowa, however, continued to fight U.S. troops. They were defeated in 1875. Then most Kiowa moved to the reservation. At the end of the 20th century there were about 9,000 Kiowa.

► More to explore

Native Americans

Kiribati



The Republic of Kiribati consists of 33 islands in the central Pacific Ocean. It is part of the region called Oceania. Most of the islands are low atolls, or coral reefs surrounding a lagoon. The capital is Bairiki, on Tarawa Atoll.

Geography

Kiribati includes three island groups—the Gilbert Islands, the Phoenix Islands, and most of the Line Islands—and Banaba Island. The islands are spread over about 2 million square miles (5 million square kilometers). Kiritimati

(Christmas Island), in the Line Islands, is the world's largest coral atoll. It makes up nearly half of the country's land area. Kiribati has hot weather year-round.

Plants and Animals

Coconut palms are among the few plants that grow in Kiribati. Breadfruit trees and pandanus palms also grow on some of the islands. Kiribati's animals include seabirds and a variety of fish.

People

Almost all the people of Kiribati are Micronesians. Nearly everyone is Christian. Most people speak Gilbertese, but English is common on Tarawa Atoll. Most of the population lives in the Gilbert Islands. People usually live in huts.

Economy

Most people in Kiribati are farmers or fishers. The main crops are coconuts, taro, bananas, breadfruit, and papayas. Kiribati sells copra (dried coconut meat) and fish to other countries.

History

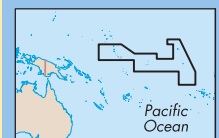
Great Britain took over the Gilbert Islands in 1892. Japan occupied Kiribati during World War II. The United States and Britain tested nuclear weapons on Kiritimati in the 1960s. Kiribati gained independence from Britain in 1979.

► More to explore

Bairiki • Oceania



Facts About KIRIBATI



Population
(2008 estimate)
97,200

Area
313 sq mi (811 sq km)

Capital
Bairiki

Form of government
Republic

Major villages
Betio, Bikenibeu, Teoraereke, Bairiki



Men farm seaweed in the shallow waters off the coast of Tabiteuea, Kiribati.

Kite

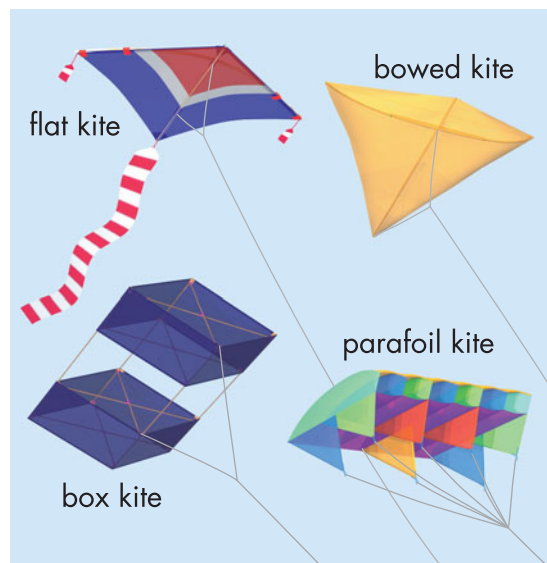
Kites are popular toys on windy days. A kite is made of paper, plastic, or cloth stretched across a light, often wooden frame. They fly high in the air at the ends of long strings.

Kites come in many sizes and shapes. Many simple kites are flat and shaped like diamonds. More complex kites might be shaped like boxes or even like animals.

Flying a Kite

Getting a kite into the air can take two people. One person holds the kite facing the wind. Another person stands some distance away and holds the kite's string. If the string is tight, the wind will push against the kite and raise it. The wind's force keeps the kite up.

Many children and adults fly kites for fun. Some form clubs that hold kite-flying events. In many Asian countries, kite flying is part of festivals.



Kites come in many different shapes.

History

People flew the first kites about 3,000 years ago, probably in China. These kites were strips of bamboo covered with silk.

Later, scientists used kites to study weather. In the American colonies in 1752 Benjamin Franklin flew a kite with a key attached in a thunderstorm. The key drew electricity from the storm, proving that lightning was a form of electricity. Such experiments are dangerous, however. Ordinarily kites should never be flown during bad weather.

Kites also teach aerodynamics—how solid objects move through the air. Inventors of early airplanes based many of their ideas on kites.

Military forces have used kites, too. During the early 1900s kites carried cameras and even soldiers to spy on enemies. During World War II (1939–45) soldiers practiced shooting down planes by shooting at kites.

► More to explore

Airplane • Toy

Klamath and Modoc

The Klamath and the Modoc were two neighboring Native American peoples. They traditionally lived in what are now Oregon and California. They were separate tribes, but their languages and cultures were similar.



A photograph from the 1920s shows a Klamath woman preparing food.

Both tribes got much of their food by fishing. They also hunted small animals and gathered roots, berries, and seeds. During the winter Klamath and Modoc families kept warm in earth-covered homes. While on hunting and fishing trips in the summer, they camped in shelters made of poles and mats.

The Klamath and the Modoc had little if any contact with people other than Native Americans until the early 1800s. By the 1850s many settlers were invading Klamath and Modoc lands. In 1864, after years of fighting, the tribes agreed to give most of their territory to the U.S. government. Along with other Indian groups, they moved onto a reservation in southern Oregon.

A group of Modoc fled the reservation and were eventually sent to live in

Indian Territory (now Oklahoma). They became known as the Modoc Tribe of Oklahoma. In Oregon the Klamath, the Modoc, and the Yahooskin Band of the Snake Indians together become known as the Klamath Tribes. At the end of the 20th century there were about 500 Modoc and fewer than 3,000 Klamath.

► More to explore

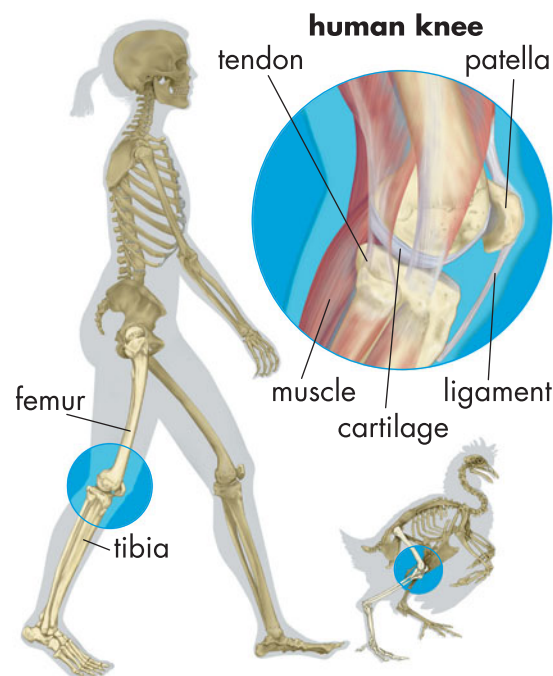
Native Americans

Knee

The biggest joint in the human body is the knee. A joint is a place where bones meet. The knee lets the leg straighten and bend. It also supports the weight of the body above it.

The Human Knee

Two large bones, the femur and the tibia, meet at the knee. The femur is the



Humans, chickens, and all other animals that have a backbone and legs have knees.

thigh bone, and the tibia is the shin bone. Ligaments, or tough strands of tissue, connect the bones to each other. A layer of springy tissue called cartilage cushions the ends of the bones. A smaller bone called the patella, or knee-cap, sits at the end of the femur. The patella protects the front of the knee joint.

A large muscle group in the thigh comes together at the knee. It makes the leg straighten. When the leg is straight, the knee's ligaments tighten. This prevents the lower leg from rotating. Other muscles in the thigh make the leg bend.

Knees of Other Animals

All vertebrates, or animals with a backbone, that have legs also have knees. In many animals, including birds and horses, it looks as if the knees of the hind legs bend backward. These joints are actually ankle joints, not knees. The knees, which are higher on the leg, bend forward like human knees.

► More to explore

Bone • Leg • Muscle

Knight

Today the king or queen of England makes people knights to honor good work. Male knights are called Sir. Female knights are called Dame. Hundreds of years ago knights were very different. They served an important role in society during the period called the Middle Ages (AD 500–1500). A knight then was a fighter of wars. He rode a



A picture from the 1300s shows knights on horseback returning from a tournament. Tournaments were contests in which knights showed off their skills and bravery.

horse and served a lord, or powerful landowner.

In the Middle Ages, a knight started training at about the age of 7. He was sent to live in the house of a lord. There he was a page. A page did odd jobs. He also learned different skills, including reading, writing, and hunting. At about age 12 he became a squire. A squire served a knight and learned how to use swords and spears. He also learned how to get around in body armor. At about age 21 the squire promised to serve a lord. Then the squire became a knight.

Knights were important during the Crusades. The Crusades were wars between Christians and Muslims. Knights, who were Christian, traveled to the Middle East to fight Muslims between 1095 and 1291. Several orders, or organized groups, of Christian knights formed

Did You Know?

The word knight comes from the Old English word *cniht*, which means "horseman."

during this time. Some of these orders became rich and powerful.

During the late Middle Ages there were changes in the way people fought wars. New weapons came into use that could be used from long distances. These included crossbows and cannons. They made knights less important. By the 1500s knighthood had become an honor that had almost no connection to fighting.

► More to explore

Crusades • Middle Ages

Knitting

Knitting is the making of textiles, or cloth, by interlocking, or connecting, loops of yarn. The yarn is usually wool or cotton, but almost any type of fiber can be knitted. Knitted cloth may be plain. Or it may contain many colors of yarn knitted together in attractive patterns.



Many people enjoy knitting sweaters, scarves, and other types of clothing as a hobby.

Knitting is different from weaving. Woven cloth does not have interlocking loops. Instead two sets of yarn cross each other in an over-under pattern. The interlocking loops make knitted cloth more stretchy than woven cloth. For this reason socks, tights, and other formfitting clothes are usually knitted, not woven.

Knitting by hand is a popular hobby. A knitter begins by looping yarn onto two or more needles. Knitting needles come in different lengths and widths. The knitter then uses the needles to stitch many loops of yarn together. Today most knitted cloth is made on large, fast, computer-controlled machines.

People have been knitting since ancient times. Early fishermen knitted fishnets. Knitted cloth from thousands of years ago has been found in Egyptian tombs. Throughout history home knitters have made sweaters, shawls, mittens, and socks for their families.

► More to explore

Clothing • Fibers • Textile

Koala

The koala is a small, furry animal of eastern Australia. It is sometimes called a “bear” because it looks like a living teddy bear. But the koala is not really a bear. It belongs to the group of animals called marsupials, which carry their young in a pouch. The scientific name of the koala is *Phascolarctos cinereus*.

The koala has a sturdy body with pale gray to yellowish fur. It is about 24 to 33

Did You Know?

Queen Elizabeth I, who ruled England from 1558 to 1603, wore knitted silk stockings.



A koala sits on a eucalyptus branch.

inches (60 to 85 centimeters) long. It has small, yellow eyes; a round, black, leathery nose; and big, fluffy ears.

The koala lives mostly in eucalyptus trees. It has strong claws and toes that help it to grasp branches. The koala eats the leaves of only a few types of eucalyptus tree. It can be hard for a koala to find food because it is such a picky eater.

A female koala has one baby at a time. The baby is called a joey. The mother carries the joey in her belly pouch for a few months. Then the joey climbs onto its mother's back. It clings to her until it is about 1 year old.

The koala was once hunted by the millions for its fur. Then governments passed laws to protect it. But the koala is

still threatened by disease and by the loss of its natural habitat.

► **More to explore**

Eucalyptus • Marsupial

Konigsburg, E.L.

The U.S. author E.L. Konigsburg has written several novels for young people. She has won two Newbery Medals, the top honor for children's fiction. Konigsburg's books deal with the important and everyday problems of children.

Konigsburg's original name was Elaine Lobl. She was born on February 10, 1930, in New York City. She grew up in Pennsylvania and earned a degree in chemistry. After graduation she married David Konigsburg.

E.L. Konigsburg began writing novels after her children were in school. Her first book, *Jennifer, Hecate, Macbeth, William McKinley, and Me, Elizabeth*, was published in 1967. The novel is about the character Elizabeth's loneliness at a new school, where she does not fit in. When she meets Jennifer, another outsider, the two girls become friends. The idea for the story came from the experiences of Konigsburg's daughter, who had to adjust to school in a new place.

Also in 1967, Konigsburg published *From the Mixed-Up Files of Mrs. Basil E. Frankweiler*. In the book, the heroine Claudia runs away from home with her brother, Jamie. They hide in the Metropolitan Museum of Art in New York

City. There they solve a mystery about an important statue. Konigsburg illustrated the book in addition to writing it. It won the Newbery Medal.

Konigsburg later published several other novels. She won her second Newbery Medal in 1997. That award was for *The View from Saturday*, a book of short stories.

► More to explore

Fiction • Literature for Children

Kootenai

The Kootenai (or Kutenai) are a tribe of Native Americans. They probably once lived on the Great Plains, in the middle of North America. Long ago, however, they moved west across the Rocky Mountains. There they settled in Idaho, Montana, and British Columbia, Canada.

The Kootenai got much of their food by fishing. They fished with spears and nets. They also built canoes from logs

and bark. The Kootenai also hunted. In the 1700s they got horses. They rode their horses east over the Rockies to hunt bison (buffalo) on the Great Plains. The Kootenai adopted some customs of the other Indians they met there. Like Plains Indians, the Kootenai wore clothing made from animal skins and lived in tepees while hunting.

In the early 1800s U.S. traders began arriving in Kootenai territory. The Kootenai were friendly to the newcomers. In 1846 the border of the United States and Canada was set. The border split Kootenai land between the two countries. Some Kootenai on the U.S. side moved north to Canada. Others settled on reservations in Idaho and Montana. The Canadian Kootenai settled in British Columbia.

At the end of the 20th century there were about 1,200 Kootenai. Half lived in the United States and half lived in Canada.

► More to explore

Native Americans

Koran

The Koran (or Qur'an) is the holy book of Islam. According to Muslim tradition, God revealed the Koran to the prophet Muhammad in visions and messages over a period of 20 years. In Islam, the book is regarded as the true word of Allah, or God. It is the final authority in Islamic social, religious, and legal matters.

Did You Know?

Each chapter of the Koran has a title taken from an important word in the chapter, such as "The Poets."



A Kootenai group poses in front of a tepee in the early 1900s.

The Koran was written in Arabic. It is divided into 114 chapters called suras, each of which includes a prayer and verses.

Message

During the time of Muhammad, Arabs worshipped many gods. The Koran emphasizes that there is only one God, Allah. Allah's message to Muhammad is both a warning and a promise. The warning is to all who refuse to believe in the one God. Those who believe in Allah and do Allah's will are promised a reward that will last forever.

Resurrection, or rising from the dead, is an important subject of the Koran. Other topics include angels and devils and heaven and hell. There are also chapters about marriage and divorce laws. Other sections tell the duties of



A page of the Koran has been beautifully decorated and written out by hand. Artists have taken great care in producing special copies of the holy book.



A woman reads the Koran.

parents to their children, of masters to their servants, and of the rich to the poor. The Koran also includes stories about prophets and people in the Bible.

History

Islam teaches that Muhammad received his first vision in AD 610. From time to time he received more messages from God, until he died in 632. Muhammad and his followers memorized the messages and sometimes wrote them down.

The year after Muhammad's death, many people who knew the Koran by heart were killed in a battle. Muslims feared that knowledge of the Koran would be lost, so they collected all the messages and wrote them down.

► More to explore

Islam • Muhammad

Korea, North



The Korean peninsula is a block of land that sticks out from East Asia. The nation of North Korea sits on the northern half of the peninsula. South Korea covers the southern half. The people of North Korea and South Korea share a long history and a common language. However, the two Koreas have been enemies since the late 1940s. North Korea's capital is Pyongyang.

Geography

North Korea shares borders with China, Russia, and South Korea. The East Sea, which is also called the Sea of Japan, forms North Korea's east coast. The Yellow Sea forms the country's west coast.

Mountains and valleys cover most of North Korea. The country's highest point, Mount Paektu, is in the north-east. North Korea's two longest rivers are the Yalu and the Tumen. They run along the border with China.

The winters in North Korea are long, cold, and snowy. The summers are warm and rainy. Tropical storms called typhoons sometimes strike during the rainy season.

Plants and Animals

Forests of fir, spruce, larch, and pine trees grow in the northern mountains. In the southern mountains there are

forests of oak, pine, elm, beech, and poplar trees.

Small numbers of deer, mountain antelope, goats, tigers, and leopards live in the forests. Many birds, including wild pigeons, herons, and cranes, live in the valleys. Rabbits and other small mammals are common. In the rivers there are many carp and eels.

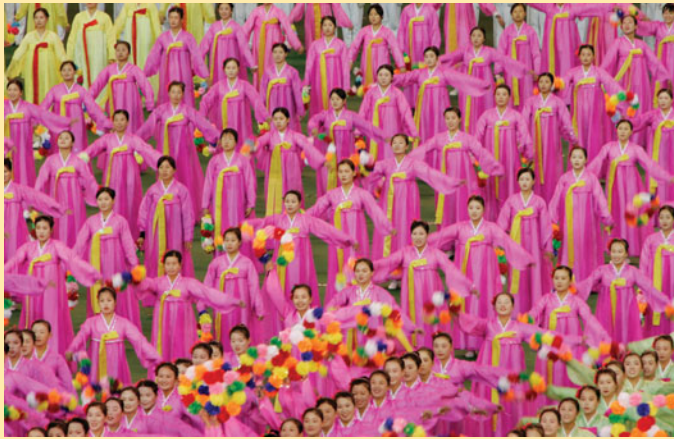
People

Nearly all the people of North Korea are ethnic Koreans. A tiny number of Chinese also live in the country. All Koreans speak the Korean language. More than half of the people live in cities.

Most North Koreans follow no religion. Smaller groups of people follow traditional Korean beliefs or a religion called Chondogyo. Chondogyo combines Buddhism, Christianity, and Confucianism (ancient Chinese teachings).



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Women wear traditional Korean clothing during a festival in Pyongyang, North Korea.

Economy

The North Korean government controls the economy. Most of the people work in factories or on farms. The factories produce iron and steel, chemicals, machinery, food products, cloth, and other goods.

North Korea's farms produce mainly rice. Other crops include potatoes, corn, cabbages, and soybeans. Fish and pigs are also important sources of food.

However, North Korea does not produce

enough food to feed its people. Hundreds of thousands of people died of starvation in the late 1990s.

History

People have lived on the Korean peninsula for more than 12,000 years. These early people settled along rivers and the seacoast. Sometime after 3000 BC the ancient kingdom of Choson rose up in the northwest. The Han Dynasty, or Han ruling family, of China conquered Choson in 108 BC.

The Three Kingdoms

By AD 400 three Korean states controlled the peninsula. Koguryo ruled the north, Paekche ruled the southwest, and Silla ruled the southeast. They are known as the Three Kingdoms.

The Three Kingdoms battled each other for centuries. With help from China, Silla defeated the Paekche and Koguryo kingdoms in the AD 600s. Silla then controlled most of Korea.



TIMELINE

Three Kingdoms rule ancient Korea.

by 400

The Choson state takes control.

1392

North Korea and South Korea gain independence as separate countries.

1948

The leaders of North and South Korea meet.

2000

The Koryo state unites Korea.

936

Japan takes over Korea.

1910

The Korean War begins.

1950



A lake lies near the top of Mount Paektu, which is the highest point in North Korea. Much of the country is mountainous.

During the peacetime that followed, Korea made advances in astronomy, medicine, metal casting, sculpture, and cloth making. Ships from Silla and China traded many products.

Koryo and Choson Periods

The Koryo state united Korea again in 936. The Koryo ruled from what is now the city of Kaesong, North Korea.

In 1392 a Korean general took power. He named his state Choson, after the ancient kingdom. The Choson capital was in the south, at what is now Seoul, South Korea.

Division into North and South Korea

In 1910 Japan made Korea into a Japanese colony. The Japanese brought modern ways, but they treated the Koreans very poorly. During World War II (1939–45) Japan forced Koreans to fight in the Japanese army. Japan lost control of Korea at the end of the war. In 1945, the Soviet Union took over the northern part of Korea. The United States sent its forces into the south.

North Korea became an independent country in 1948, one month after South Korea. Like the Soviet Union, North Korea adopted a Communist form of government.

The Korean War

In 1950 North Korea started the Korean War by invading South Korea. The United States and other countries helped South Korea. China, a Communist country, helped North Korea. The war ended in 1953 with the peninsula still divided.

North Korea After the War

North Korea's government ruled harshly. After President Kim Il-sung died in 1994, his son Kim Jong Il came to power.

In 2000 the leaders of the two Koreas met for the first time. They agreed to work toward a peaceful, reunited Korea. However, the relationship between the two countries remained tense.

► More to explore

Communism • Korea, South • Korean War • Pyongyang

Facts About NORTH KOREA



Population
(2008 estimate)
23,867,000

Area
47,399 sq mi
(122,762 sq km)

Capital
Pyongyang

Form of government
Republic

Major cities
Pyongyang,
Nampo,
Hamhung,
Chongjin,
Kaesong, Sinuiju



Korea, South

For many centuries Korea was a single state on the Korean peninsula. The Korean peninsula is a piece of land that sticks out from East Asia. In the mid-1900s Korea divided into two countries: North Korea and South Korea. South Korea, also known as the Republic of Korea, covers the southern half of the peninsula. Seoul is South Korea's capital and largest city.

Geography

South Korea's only land border is with North Korea. South Korea's eastern border lies along the East Sea, or Sea of Japan. The Yellow Sea is to the west. The East China Sea is to the south. A large island named Cheju lies off South Korea's southwest coast.

Low mountains cover most of South Korea. The country's highest peak is Mount Halla on Cheju Island. South Korea's three largest rivers are the Nak-



People walk down a busy street in Seoul, South Korea.

tong, the Han, and the Kum. The lowlands near the rivers provide the country's best farmland.

South Korea has cold, dry winters. Its summers are hot and humid. The southern coast is the wettest part of the country.

Plants and Animals

Evergreen forests of camellia, camphor, and other trees grow on the southern coast and on Cheju Island. Pines, oaks, maples, and birches also grow in South Korea.

Deer and rabbits are among the most common animals. Many types of birds, reptiles, and fish also live in the country. South Korea's national parks protect some plants and animals.

People

Almost all the people of South Korea are ethnic Koreans. They speak the Korean

language. There is also a small group of Japanese people. Most South Koreans live in cities and towns. Many of the cities are very crowded.

Half of the population follows no religion. About one in four South Koreans is Christian. About the same number of people are Buddhists.

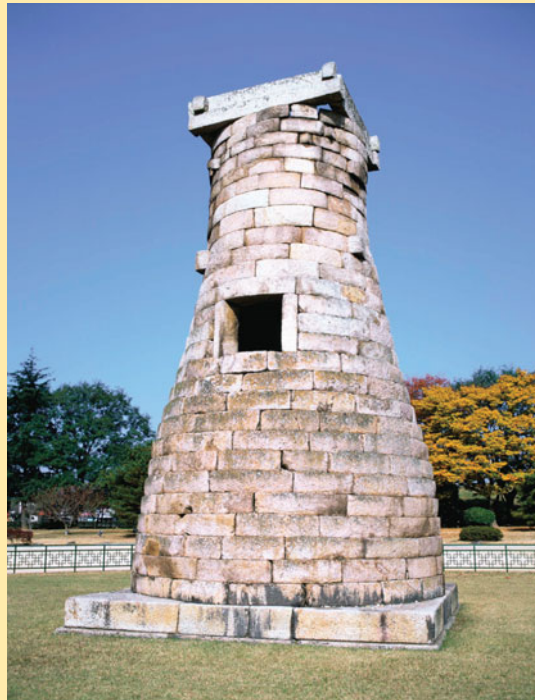
Economy

The South Korean economy depends on services and manufacturing. Services include banking, education, stores, the military, transportation, and entertainment.

Huge companies called *chaebol* control much of the country's industry. Factories in South Korea make cellular phones, televisions, and other electronic equipment. They also make cars, ships, machinery, cloth, and chemicals.



Statues at a museum in South Korea show men in traditional Korean clothes.



The first astronomical observatory in Asia was built in Kyongju, South Korea, in the 600s.

Agriculture is a smaller part of the economy. Rice is the most important crop. Other crops include cabbages, onions, and fruits. Farmers also raise large numbers of pigs, cattle, and chickens. Fish come from the sea or from fish farms.

History

By 10,000 BC people had settled on the Korean peninsula. The ancient kingdom of Choson was founded after 3000 BC. It was located in the northwest. In 108 BC Choson fell to the Chinese.

The Three Kingdoms

In the 1st century BC the Three Kingdoms were founded. They were Koguryo in the north, Paekche in the southwest, and Silla in the southeast. By AD 400 they controlled the peninsula.

The Three Kingdoms often fought each other. In the AD 600s Silla joined forces with China. It then conquered Paekche in 660 and Koguryo in 668. Most of Korea was then under Silla rule.

A period of peace followed. This time was marked by great achievements in such areas as medicine, sculpture, and cloth making. Silla and China were major trading partners.

Koryo and Choson Periods

In the 800s Silla lost control of parts of Korea. In 936 the Koryo state united the peninsula. Its capital was located in the north, at what is now Kaesong, North Korea.

Koryo was invaded several times in the 1200s. In 1392 it was overthrown by a Korean general. He founded the Choson Dynasty. Its capital was located in the south, at what is now Seoul, South Korea.

Division into North and South Korea

Korea became a Japanese colony in 1910. Japan tried to modernize Korea. However, it ruled harshly. Japan was defeated in World War II. Under a war-time agreement, the United States took over the southern part of Korea. The Soviet Union took over the north.

South Korea became a separate, independent country in 1948. Several weeks afterward, North Korea also became independent.

The Korean War

In 1950 North Korea invaded South Korea. The invasion started the Korean War. The United States and other countries sent armies to help South Korea. China supported North Korea.

About 1,800,000 Koreans were killed during the war. In 1953 the war ended, with the peninsula still divided into North Korea and South Korea. Ever since, armies have guarded both sides of the border.

South Korea After the War

South Korea changed its system of government several times. During the 1960s and 1970s, army leaders controlled the government. They did not allow anyone to challenge their power. They killed or arrested many people who disagreed with them.

In 1979 President Park Chung Hee was assassinated. In 1980 many people protested against the military government. Finally, in 1987, the constitution was changed to allow all the people to elect the president.

South Korea began to develop better relations with other countries. The 1988 Summer Olympic games took place in Seoul. North Korea and South Korea both joined the United Nations in 1991. The leaders of the two countries met for the first time in 2000. They agreed to work together.

► More to explore

Korea, North • Korean War • Seoul

Facts About SOUTH KOREA



Population
(2008 estimate)
50,187,000

Area
38,572 sq mi
(99,900 sq km)

Capital
Seoul

Form of government
Republic

Major cities
Seoul, Pusan,
Inchon, Taegu,
Taejon

Korean War

North Korea and South Korea fought the Korean War from June 1950 to July 1953. Other countries, notably the United States and China, also were involved. It was the first major battle over Communism. Communism is a political and economic system in which the government owns all property. Communism was first established in the Soviet Union. The United States and others were opposed to Communism.

Japan controlled Korea until the end of World War II (1939–45). After Japan lost the war, the Soviet Union took over in the north, while the United States took over in the south. The 38th parallel of latitude (38° north) was the dividing line between the two parts. In 1948 the country was officially divided into North Korea and South Korea.

On June 25, 1950, the North Koreans, supported by the Soviets, attacked southward across the 38th parallel. This began the Korean War.

The United States and 15 other countries sent troops to help South Korea. The North Korean army drove the South Koreans and early U.S. forces back to the southeast tip of the Korean Peninsula. Then fresh U.S. troops arrived. By October 1, 1950, the North Koreans had retreated to the north of the 38th parallel.

South Korea and its allies then advanced into North Korea. This angered China, a Communist country on North Korea's



The Korean War Veterans Memorial in Washington, D.C., honors Americans who served in the Korean War.

northern border. On November 25, 1950, Chinese troops entered the war. By December 15, they had driven the allies back south of the 38th parallel. By June 1951, after several more battles, the battle line stood mostly north of the 38th parallel.

Peace talks began in July 1951. On July 27, 1953, both sides signed an agreement. The boundary between North and South Korea was set very close to the battle line of June 1951. The Korean War took the lives of about 1,300,000 South Koreans, 1,000,000 Chinese, 500,000 North Koreans, and 37,000 Americans. Korea remained divided into the 21st century.

► More to explore

Communism • Korea, North • Korea, South



Kosovo

Kosovo is a self-declared country in the Balkans region of southeastern Europe. It was a province of Serbia until 2008, when the people of Kosovo declared their independence. Pristina is the capital of Kosovo.

Kosovo is bordered by Serbia to the north and east, Macedonia to the south, Albania to the west, and Montenegro to the northwest. Its land consists largely of two basins situated between mountains.

The land is good for growing crops. The people of Kosovo grow grains including wheat, barley, and corn. They also grow fruits and vegetables. They grow tobacco to be sold.

More than 90 percent of the people of Kosovo are Albanians. Most of the rest are Serbs. Islam is the main religion.

Kosovo once lay at the heart of the Serbian empire. Then the whole region was

conquered by the Ottoman Turkish army in 1389, and the two regions gained separate identities. Serbia won independence from Turkey early in the 1800s and regained control of Kosovo in 1912. In 1918 Serbia became part of a kingdom that was later renamed Yugoslavia. Kosovo remained a part of Serbia even after the rest of Yugoslavia broke apart in the early 1990s.

At about that time, Kosovo's Albanians began a movement to gain independence. A group called the Kosovo Liberation Army (KLA) began an armed rebellion in 1996. In response, the Serbian government attacked the Albanians. By 1998 widespread fighting had broken out between the KLA and Serbian troops. In March 1999 the North Atlantic Treaty Organization (NATO) launched a bombing campaign against the Serbians to try to stop the attacks on the Albanians. The fighting ended in June 1999.

The United Nations then took charge of running the province. By early 2008 Kosovo was determined to break away from Serbia. The province formally declared independence in February. The United States and several members of the European Union (EU) recognized Kosovo's independence. Serbia, Russia, and a number of other countries did not.

► More to explore

Pristina • Serbia • Yugoslavia

Facts About KOSOVO



Population
(2008 estimate)
2,143,000

Area
4,212 sq mi
(10,908 sq km)

Capital
Pristina

Form of government
Multiparty transi-
tional republic

Major cities
Pristina, Prizren,
Ferizaj, Mitrovice,
Gjakove, Peje



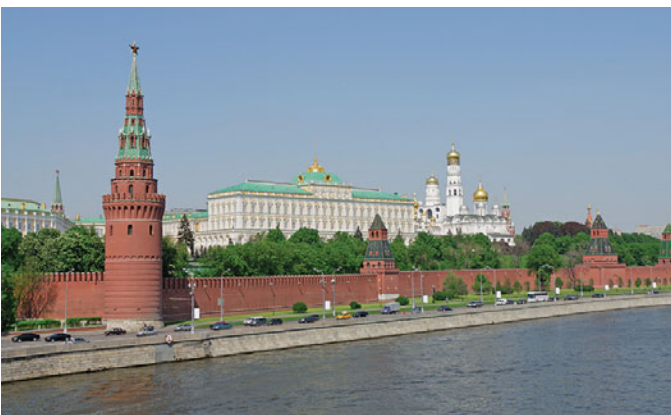
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Kremlin

Several cities in Russia were built around fortresses called kremlins. Russians built kremlins for defense during the Middle Ages. A kremlin was often located along a river. A wall, a moat, and towers usually separated it from the surrounding parts of the city. Kremlins contained cathedrals (churches) and palaces for princes and bishops. They also held government offices and ammunition.

The most famous kremlin is located in central Moscow. It is often called just the Kremlin. The Kremlin is shaped like a triangle. Its east side faces the famous plaza called Red Square. Another side faces the Moscow River. The Kremlin has long been a symbol of Russia's power.

A Russian prince started building the Kremlin in 1156. It was first built of wood. In the 1300s it was rebuilt using white stone. Its red brick walls and great palaces, cathedrals, and towers were added later. Several of the palaces are now museums.



Behind the red brick walls of the Kremlin are many churches, palaces, and government buildings.

The Kremlin lost its importance as a fort in the 1620s. But it was the center of Russian government until 1712, when the capital was moved from Moscow to Saint Petersburg. Moscow once again became the capital in 1918 following the Russian Revolution. The Kremlin became the base of government when Russia became part of the Soviet Union in 1922. After the Soviet Union collapsed in 1991, the Kremlin remained the center of Russia's government.

► More to explore

Moscow • Russia • Union of Soviet Socialist Republics

Krill

Krill are shrimplike animals that live in the ocean. They belong to the group of animals called crustaceans, which also includes shrimp, crabs, and lobsters.

There are about 85 species, or types, of krill. They are an important source of food for fish, squid, whales, seabirds, and other animals, especially around Antarctica.

Krill can grow to about 2.5 inches (6 centimeters) in length. Like other crustaceans, krill have a hard covering known as an exoskeleton. A krill sheds this outside covering many times as it grows. The body is almost see-through, with small, reddish spots. Krill have many legs, which they use for swimming and gathering food. Most krill have special organs, or body parts, on their

underside that give off light. This makes them visible at night.

Krill swim together in large groups called swarms. Some swarms are so thick that they make the water look pink. Krill spend much of their time deep in the ocean away from enemies. At night they go to the water's surface to feed on plants or tiny animals. Krill are able to go without eating for months at a time.

Fishers catch krill to use as food for people and land animals. They are a rich source of vitamin A.

► More to explore

Crustacean

Kuala Lumpur



Population
(2000 estimate)
1,297,526

Kuala Lumpur is the capital of Malaysia, a country of Southeast Asia. It is the largest city in Malaysia. It is also the country's center of business and culture. In 1999 Malaysia's government began building a city called Putrajaya to be the new capital.

The economy of Kuala Lumpur depends on manufacturing and services such as banking, health care, and tourism. Fac-



The Petronas Twin Towers in Kuala Lumpur, Malaysia, were the world's tallest buildings when they were built in the late 1990s.

tories in the city make computer parts, electronics, furniture, foods, and other products.

Kuala Lumpur was founded by Chinese tin miners in 1857. The British soon took over the area. In the late 1880s Kuala Lumpur became the capital of a region called the Federated Malay States.

In 1957 the western part of Malaysia became independent. Kuala Lumpur was its capital. The rest of Malaysia became independent in 1963. Then Kuala Lumpur became the capital of all of Malaysia. The city grew very quickly.

► More to explore

Malaysia

Ku Klux Klan

The Ku Klux Klan, or KKK, is a terrorist group in the United States. Terrorist groups seek to achieve their goals by creating fear through violence. The Klan

formed after the Civil War ended in 1865. Its purpose was to frighten newly freed African Americans and to take away their rights. By the 1990s the Klan had broken up into small groups, mostly in the Southern states.

The early Klan was called the Invisible Empire of the South. Its leaders had such titles as Grand Wizard, Grand Dragon, and Grand Titan. Klan members wore white robes and hoods to hide their faces and to frighten people. They went out at night to scare, whip, and kill former slaves. Sometimes they burned homes and barns. After their raids Klan members often left behind a burning cross as a symbol of the Klan.

The Klan's membership went up and down over the years. It reached a peak of about 4 million members in the 1920s. At that time the Klan's list of enemies grew to include Catholics, Jews, immigrants (people from other countries), and others.

The Klan grew again in the 1960s. It was the time of the civil rights movement, which worked to gain equal rights for African Americans. Klan members protested this movement by attacking African Americans in the South.

Since then the number of Klan members has fallen to a few thousand people. The Federal Bureau of Investigation (FBI) and other police groups have watched the Klan and worked to prevent its members from hurting people. Courts have sent some Klan members to jail for

crimes that they committed many years earlier.

► More to explore

African Americans • Terrorism

Kurd

The Kurds are an ethnic group that lives mostly in a mountainous region called Kurdistan. Kurdistan lies in southwestern Asia where the countries of Turkey, Iran, Syria, and Iraq meet. Kurds also live in other nearby countries. They speak a language called Kurdish.

Kurds have lived in the same territory since prehistoric times. Early Kurds moved from place to place while herding sheep and goats. Some Kurds still bring their animals to mountain pastures in the summer and return to their villages in winter. Many Kurds, however, are farmers who stay in one place. Some Kurds have moved to cities.

In the 600s most Kurds became followers of the religion known as Islam. People who practice Islam are called



Many Kurds now live in cities, but some still lead traditional lives of animal herding.

Muslims. There are two types of Muslims: Sunnites and Shi'ites. Most Kurds are Sunnites. They have had problems in regions governed by Shi'ites.

Many Kurds want to have their own country. The governments of those countries in which they live—especially Turkey and Iran—have sometimes tried to force the Kurds to give up their language and culture. The government of Iraq drove millions of Kurds out of their homes in the 1980s and 1990s. Kurds have often rebelled against the governments of Turkey, Iran, and Iraq. They hoped to win political and cultural freedom.

► More to explore

Islam



trade with other peoples. The Kushites could ship goods on the Nile River. They could also transport goods on roads to the Red Sea.

Kush

The ancient kingdom of Kush (also spelled Cush) ruled a region in Africa south of Egypt. The region was then called Nubia. Now it is a part of the country of Sudan. Kush began as an Egyptian colony. It rose to rule over Egypt and much of the Nile River valley. Kush combined Egyptian and other African cultures.

The people of Kush, called Kushites, were black Africans. Most Kushites were farmers, but there were also craftsmen and traders. The Kushites sometimes captured other people.

Kush was a rich kingdom. It had gold mines. It also had rich farmland. In addition, Kush was in a good location to

Nubia was originally part of ancient Egypt. During the 1400s BC Egypt divided Nubia into two parts. Kush was the southern part. During the 700s BC the Kushites took control of Egypt. In the 600s BC, however, the Assyrians from Asia drove them back to Nubia.

After that, Kush was a smaller kingdom on the middle Nile for almost 1,000 years. The kingdom of Aksum finally wiped out Kush in about AD 350.

► More to explore

Aksum • Egypt, Ancient • Nubia
• Sudan

Kutenai

► see Kootenai.

Did You Know?

The Kushites sold gold, incense, ivory, ebony, oils, ostrich feathers, and leopard skins to other peoples.

Kuwait

Despite its small size, the Middle Eastern country of Kuwait has some of the largest oil reserves in the world. The capital is Kuwait city.

Kuwait borders Iraq and Saudi Arabia. The Persian Gulf is to the east. Kuwait is a hot, flat desert with no lakes or rivers.

Kuwait's plants are mainly scrub and low bushes. Saltwater plants grow along the coast. The animals of the desert include foxes, small mammals called civets, gazelles, lizards, and snakes.

Most of Kuwait's people are Arabs. Many of them were born in neighboring Arab countries or in South Asia and came to Kuwait to work. Arabic is the main language, but English is common. Most Kuwaitis follow Islam. Almost all the people live in or near Kuwait city.

The economy of Kuwait depends on the sale of its oil. Kuwait also produces



Water towers dot the sky in Kuwait's capital.

natural gas, food products, clothing, and metal products. Agriculture is limited to growing small vegetable crops.

Nomads, or wandering peoples, lived in what is now Kuwait for many centuries. In 1756 a member of the Sabah family became sheik, or ruler, of Kuwait. The Sabah family ruled the country into the 21st century. In 1899, however, Great Britain took over Kuwait's foreign affairs.

In 1961 Kuwait gained independence. In 1990 Iraq invaded Kuwait. The invasion led to the Persian Gulf War. United Nations forces, led by the United States, drove Iraqi troops out of Kuwait in 1991.

► More to explore

Kuwait • Middle East • Persian Gulf War



Facts About KUWAIT



Population
(2008 estimate)
3,530,000

Area
6,880 sq mi
(17,818 sq km)

Capital
Kuwait (city)

Form of government
Constitutional monarchy

Major cities
As-Salimiyah,
Qalib ash-Shuykh,
Hawalli, Kuwait (city)



Kuwait



Population
(2005
estimate), city,
32,403; urban
area,
1,810,000

The city of Kuwait is the capital of a country that is also named Kuwait. The city lies on a bay of the Persian Gulf, in the Middle East. Its name comes from the Arabic work *kut*, meaning “fort.”

Many government, business, and banking offices are located in Kuwait city. Kuwait University is also there. The city and its suburbs have large oil and chemical industries.

A group of Arab families founded Kuwait city in the early 1700s. For more than 200 years the city’s people made a living mostly by fishing and gathering pearls.



Modern skyscrapers rise above the city of Kuwait, Kuwait.

The country started producing oil in the middle of the 1900s. As a result Kuwait city grew much bigger and wealthier.

In 1990 troops from neighboring Iraq captured Kuwait city. The Iraqis took everything of value there, including food supplies. Many people fled. The invasion of Kuwait led to the Persian Gulf War of 1991. Iraq lost the war. Kuwait’s people then moved back and repaired the damage to the city.

► More to explore

Kuwait • Persian Gulf War

Kwakiutl

The Kwakiutl are the people of several related Native American groups. They traditionally lived on or near Vancouver Island in what is now British Columbia, Canada.

The Kwakiutl built their villages along the water. They lived in large rectangular houses made from cedar wood. They made dugout canoes from the trunks of cedar trees. The Kwakiutl got most of their food by fishing and hunting deer and moose.

The Kwakiutl were famous for their ceremonial feasts known as potlatches. The family hosting a potlatch gave fine gifts to their guests. Potlatches were held to celebrate important occasions, such as a marriage or the birth of a child, or to make up for some offense against the tribe.



Chief Hamasaka of the Kwakiutl holds a ceremonial staff and rattle.

In the late 1700s British, American, and Russian traders began to arrive in the Kwakiutl's land. They brought goods such as steel tools. They traded these to the Kwakiutl in exchange for furs. In the mid-1800s settlers and missionaries began to arrive. They brought diseases that killed many Kwakiutl.

Both the missionaries and Canadian officials wanted the Kwakiutl to give up their old ways. Potlatches were outlawed by the Canadian government between 1889 and 1951. In the early 21st century there were more than 4,000 Kwakiutl living in Canada.

► More to explore

Native Americans • Smallpox

Kwanzaa

Kwanzaa is a celebration of African family, community, and culture. This Afri-

can American holiday was created in 1966 by a professor named Maulana Karenga. It is based on African harvest festivals. Its name comes from the African language Swahili and means “first fruits.” Kwanzaa takes place each year from December 26 to January 1.

The symbols of the festival come from different African cultures. The symbols include a candleholder, seven candles, ears of corn, gifts, and a unity cup. The celebrants use the unity cup to salute their ancestors and to show unity in the family and community.

Each day of Kwanzaa is dedicated to one of seven principles, or ideas. The principles are unity, self-determination, collective responsibility, cooperative economics, purpose, creativity, and faith. Each night, one or more of the seven candles is lit. Then, one of the seven principles is discussed. Kwanzaa is also celebrated with a community feast on December 31.



A family dressed in traditional African clothing lights candles for Kwanzaa. Other symbols of Kwanzaa, including an ear of corn and the unity cup, are on the table.



Kyrgyzstan

The Kyrgyz Republic, also known as Kyrgyzstan, is an independent nation in Central Asia. Until 1991 it was part of the Soviet Union. The capital is Bishkek.

Geography

Kyrgyzstan borders Kazakhstan, China, Tajikistan, and Uzbekistan. The massive Tian Shan mountain system runs throughout Kyrgyzstan. Its highest point is Victory Peak, at 24,406 feet (7,439 meters) tall. In general, Kyrgyzstan's summers are hot and its winters are cold. The lowest and highest areas are deserts.

Plants and Animals

Evergreen forests grow in the lower valleys and on some mountain slopes. White spruce, larch, juniper, and walnut trees are common. In the forests live brown bears, wild pigs, lynx, gray wolves, and ermines. Mountain sheep and goats, deer, and snow leopards live in the valleys. Hares, yellow gophers,

and large-eared hedgehogs live in the deserts.

People

Most of the people are Kyrgyz. The largest minority groups are Uzbeks and Russians. Most people speak Kyrgyz, a Turkic language, or Russian. About three fourths of the people are Muslims. More than half of the population lives in rural areas.

Economy

About half of Kyrgyzstan's workforce works in agriculture. They raise sheep, cattle, and horses. Crops include wheat, potatoes, sugar beets, cotton, and tobacco. Mines provide gold, coal, antimony, and mercury. Industries produce machinery and cloth. Kyrgyzstan also uses waterpower to produce electricity.

History

The ancient Kyrgyz were nomads, or wanderers. Beginning in the 1200s the Mongols, China, and neighboring Muslims ruled the Kyrgyz region at different times. In the late 1800s Russia gradually took control. The Kyrgyz lands became part of the Soviet Union in 1924. Kyrgyzstan declared its independence in 1991. Protesters forced out Kyrgyzstan's first president in 2005.

► More to explore

Bishkek • Union of Soviet Socialist Republics

Facts About KYRGYZSTAN



Population
(2008 estimate)
5,281,000

Area
77,199 sq mi
(199,945 sq km)

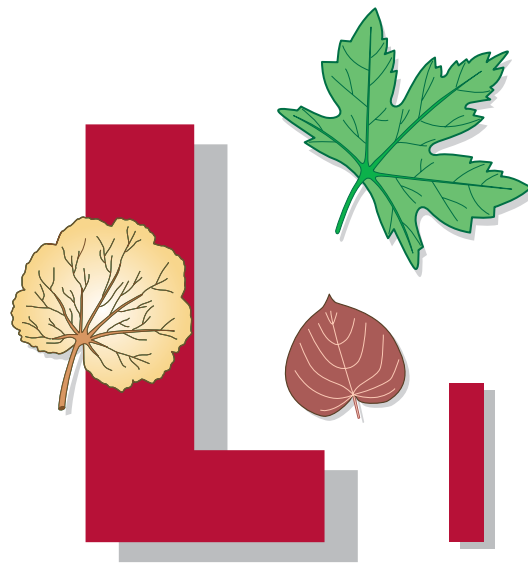
Capital
Bishkek

Form of government
Republic

Major cities
Bishkek (Frunze),
Osh, Dzhalsal-
Abad, Tokmak,
Karakol



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Lacrosse is the oldest team sport in North America. Native Americans invented the game.

(See Lacrosse.)

Rainstorms, melting snow, and earthquakes can cause landslides.

(See Landslide.)

The word laser stands for "light amplification by the stimulated emission of radiation."

(See Laser.)

In ancient Greece the winners of athletic and poetry contests wore crowns of bay laurel.

(See Laurel.)

A plant's leaves use energy from the sun to make food.

(See Leaf.)

The scientific name of the llama is *Lama glama*.

(See Llama.)

Labor

Most people have to work to get food, clothing, housing, and other things. Their work is called labor. Even people who do not work depend on the labor of others.

Types of Labor

In the simplest societies people work in small groups of family members or tribal members. Not everyone does the same work, however. For example, in some societies men hunt animals and fight enemies while women gather plants and care for children. This is called a division of labor.

In the past, many societies divided labor between free workers and slaves. Slaves got the worst jobs and could not leave them. They did not receive pay. Their owners punished them if they did not obey orders. People throughout history and in many different societies have owned slaves. Between the 1500s and the 1800s, Europeans made many Africans into slaves and took them to work in the Americas.

Like slaves, workers called serfs had to work for no pay. There were many serfs in Europe during the Middle Ages (from about AD 500 to about 1500). Serfs did farm work on land owned by more powerful people, called lords. Unlike slaves, serfs could not be sold. However, they were not free to leave the land.

In the towns of Europe in the Middle Ages, some products required special skills to make. The people who made



An illustration shows serfs working the land during the Middle Ages.

and sold them were called craftsmen. A group called a guild controlled each craft. There were guilds for weavers, blacksmiths, bakers, painters, and many other types of craftsmen. A young person learned a craft as an unpaid helper called an apprentice. Adult workers, called journeymen, got pay. A business owner was called a master.

A great change in the way people worked began in the 1700s, during the Industrial Revolution. Inventors created machines that made it easy to produce many goods quickly in factories. Many people went from working on farms and in craft workshops to working in factories. Factory workers did not need special skills, so the guilds disappeared. Factory workers usually worked long hours in unhealthy working conditions.

Did You Know?

Before 1833, children as young as 4 years old were put to work in Great Britain's cloth industry.



In the past most people worked on farms or in their homes. Today factories and other businesses employ many people.

Their pay was very low. Many children worked in factories, too.

Labor Movements

Workers soon began movements to demand better treatment from their employers. Many workers formed groups called labor unions, or trade unions. Unions often call for workers to strike, or stop working, until employers meet their needs.

United States

In the United States, skilled craft workers formed the first labor unions. Several nationwide labor groups started after the American Civil War. For example, trade unions founded the American Federation of Labor (AFL) in the 1880s.

In the 1930s the U.S. government finally gave workers real help. The National Labor Relations Act of 1935

gave workers the right to join a union. Other laws stopped child labor, helped unemployed workers, made wages higher, and shortened working hours.

In 1936 several unions formed the Congress of Industrial Organizations (CIO). The CIO supported workers in big industries like steel, automobiles, and rubber. By the end of the 1930s, unions represented almost 30 percent of U.S. workers.

The AFL and the CIO joined together in 1955. The new organization, called the AFL-CIO, was a leading force in U.S. politics. The AFL-CIO worked for job safety, equal rights for women and minorities, and bigger pensions (payments to retired people).

In the last part of the 20th century, union membership decreased in the United States. This was partly because companies were moving factory jobs outside the United States. Early in the 21st century, only 8 percent of workers for private companies belonged to unions. However, more than 35 percent of government workers were in unions.

Europe

European workers also had a long struggle for better pay and better working conditions. In Europe, however, labor unions usually combined with political parties, or groups, that supported socialism. Socialism is a political system in which the government owns certain kinds of businesses. The goal of socialism is to spread wealth more evenly. In many

Did You Know?

The first nationwide union in the United States was for printers. It was created in 1852.

countries, socialist parties got governments to provide generous benefits to workers. Union membership was higher in Europe than in the United States.

After World War II (1939–45), many countries in eastern Europe had Communist governments. Communism is a political system in which the workers share all property, based on their abilities and needs. Labor unions actually had little power in Communist countries. The governments controlled the unions completely.

However, in the early 1980s workers in Poland formed a union that became very powerful. The union was named *Solidarność* (Solidarity). At first the government banned the union. But the workers continued to hold protests and strikes. They asked for a role in the government in addition to better working conditions. Eventually the government allowed *Solidarność* members to participate in elections. This led to the end of Communist rule in Poland.



Demonstrators marching in Poland carry banners with the name of the Solidarity trade union.

Other Regions

In Asia and Africa, workers often started labor movements during the time their countries were fighting for independence from European powers. In South America, labor unions sometimes joined with governments to protect workers.

Several countries formed the International Labour Organization (ILO) in 1919. It is now an agency of the United Nations. The ILO protects the rights of workers and unions. It also helps countries to create fair labor laws.

► More to explore

Communism • Industrial Revolution
• Slavery • Socialism

Labor Day

Labor Day is a holiday that honors all workers. It also signifies the end of summer. The holiday is celebrated on the first Monday in September in the United States and Canada. Workers of all kinds enjoy the day off. It is a time for them to celebrate all that their work has made possible. The holiday is sometimes observed with parades and speeches, as well as political rallies. Other countries honor workers on May Day, which is celebrated on May 1.

Labor Day was first celebrated in the United States in New York City on September 5, 1882. At that first Labor Day, workers paraded in order to show their unity and desire for fair working conditions. The peaceful demonstration involved all types of workers, from



Many towns hold parades to celebrate Labor Day.

seamstresses to bricklayers. They waved banners bearing such slogans as, “Labor built this republic and labor shall rule it.” In June 1894 President Grover Cleveland signed a bill into law making Labor Day a national holiday.

Canadian workers first held parades in Ontario in 1872. In 1894 Canada made Labor Day a national holiday.

► More to explore

Festival and Holiday • Labor • May Day

Labrador

► see Newfoundland and Labrador.

Lace

Lace is a beautiful and delicate textile, or fabric. It is used to make clothing and to decorate household objects, such as curtains and pillows.

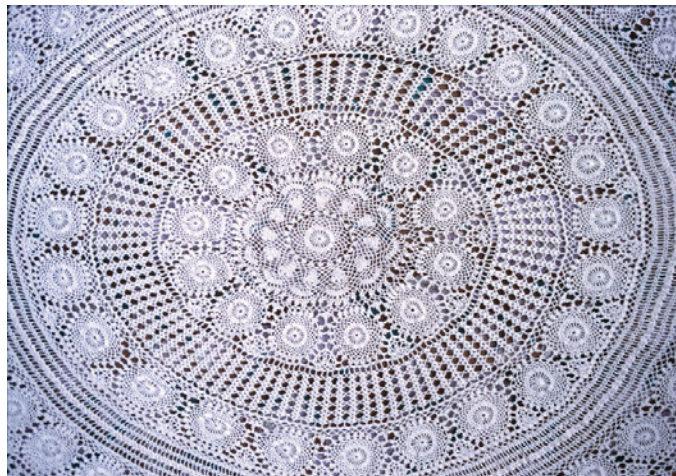
There are many different styles of lace. Each has a different pattern of flowers,

leaves, or other designs. Today lace is usually made by a machine. However, lace makers make the most artistic kinds of lace by hand, using either needles or bobbins (spools).

Needle lace requires a needle and a single thread. The lace maker stitches the lace on top of a pattern attached to a piece of cloth. When the lace is finished, the lace maker cuts the stitches holding it to the cloth.

Bobbin lace requires a number of threads wound around different bobbins. The lace maker sticks a pattern of pins into a cushion. The lace maker then twists and crosses the threads around the pins to form the lace.

Before 1800, lace making was a popular art in Europe, especially in Italy, France, and Flanders (now part of Belgium). This handmade lace took a long time to make, and only skillful people could do it. For these reasons, lace was very expensive. In the 1800s people began



The most delicate and artistic kinds of lace are made by hand.



Lace makers weave their patterns out of many pieces of thread. They use small sticks called bobbins to move the threads around.

using machines to make lace. Lace then became more affordable.

► More to explore

Clothing • Textile

Lacrosse

The game called lacrosse is the oldest team sport in North America. Native Americans played it before the arrival of Europeans. The French who arrived in the 1600s noticed that the stick used to play the game looked like a crosier. A



A lacrosse player uses his crosse to carry the ball past a player from the other team.

crosier is a staff, or rod, carried by church leaders called bishops during religious ceremonies. The name lacrosse came from the word crosier.

Playing Field and Equipment

Lacrosse is played between two teams on a long, rectangular field. There are goals at each end. The goals are made of nets fastened over a tall frame. There are 10 players on men's teams and 12 players on women's teams.

The main equipment is a rubber ball and long sticks called crosses. Crosses have a net pocket at one end to catch the ball. Each player carries a crosse during the game.

Players wear a helmet with wire face mask, shoulder pads and hip pads, and protective gloves. They also wear shoes with cleats, or tiny spikes, which dig into the ground and prevent slipping.

Rules

The object of the game is to score points by making goals. The players on one team try to score goals by throwing the ball into the goal of the opposing team. Players may use the crosse to pass the ball to other players, or they may carry the ball in the crosse. They may also knock the ball out of opponents' crosses or try to block their way. Each team has a player called the goalkeeper, who defends the goal. Goalkeepers may use their hands to smack the ball away. The other players may not touch the ball with their hands.

History

The Iroquois people played the first games of lacrosse. Teams sometimes included as many as 1,000 men, and the goals might be placed several miles apart. The games could also last many days, from sunrise to sunset.

► More to explore

Iroquois • Sports

Lafayette, Marquis de



A painting shows the Marquis de Lafayette on a horse. Lafayette was a hero in the American and French revolutions.

The Marquis de Lafayette was a French soldier and nobleman who loved freedom. He became a hero for the United States during the American Revolution. He also helped to lead the French Revolution.

Early Life

Lafayette was born on September 6, 1757, in Chavaniac, France. His original name was Marie-Joseph-Paul-Yves-Roch-Gilbert du Motier. He inherited great wealth from his mother and a castle and the title of marquis from his father.

American Revolutionary

Young Lafayette decided to help the American colonies fight the British in the American Revolution. He arrived in the colonies in 1777. The colonists made him a major general.

Lafayette fought bravely and skillfully. He also got the king of France to send 6,000 soldiers to help the colonists. In 1781 Lafayette helped defeat the British commander, Lord Cornwallis, at Yorktown, Virginia. This event ended the fighting.

French Revolutionary

Lafayette then returned to France. In 1789 he helped write the Declaration of the Rights of Man and of the Citizen. This document expressed the ideas behind the French Revolution. During the revolution, Lafayette led the new national guard of Paris.

Some of the revolutionaries had extreme ideas. They wanted to kill the king and take property away from the landowners. Lafayette did not share those views. When the extreme rebels took power in 1792, Lafayette had to leave the country. After Napoleon Bonaparte came to

Did You Know?

Lafayette is an honorary citizen of the United States. Only a few other people have received this honor.

power in 1799, Lafayette returned to France and settled down as a farmer.

Later Life

The monarchy was later restored in France. In 1830 Lafayette took part in his third revolution. He helped to overthrow King Charles X. Lafayette died in Paris on May 20, 1834.

► More to explore

American Revolution • French Revolution

Lake

A lake is a large body of water that is surrounded by land. Lakes contain less than 1 percent of the world's freshwater, but they are a very important freshwater source. Almost all of the world's freshwater is either frozen in huge masses of ice or buried underground. Lakes contain more than 98 percent of the freshwater that is available for use.

How Lakes Form

Ice sheets called glaciers formed many lakes, especially in North America,

Europe, and Asia. Thousands of years ago glaciers covered large parts of these continents. The glaciers moved slowly over the land. They dug basins, or holes, in places where the rocks at the surface were weak. The basins that filled up with water became lakes. Other lake basins formed in places where melting glaciers left dirt behind. The dirt built up to form basin walls.

Some lakes have been formed by volcanoes. Some volcanoes have blown off their tops in huge explosions. Others have had their centers collapse. Both of these events form large pits called craters. These craters can become lakes. Crater Lake, in the U.S. state of Oregon, is a well-known example of this kind of lake.

The water in lakes can come from a variety of sources. The main sources of lake water include precipitation (rain or snow), rivers and streams, and melting ice and snow. Groundwater (water below Earth's surface) can reach lakes through openings called springs.

Saltwater Lakes

Not all lakes contain freshwater. The Dead Sea, in Israel and Jordan, is the world's saltiest natural lake. Another body of salt water is the Great Salt Lake in the U.S. state of Utah. It is all that remains today of what was once a much larger freshwater lake. The lake shrank as the climate became drier and the water began to evaporate. The lake contained salt from rivers that flow into it. As the water evaporated, the salt was left behind.



A sailboat floats on a lake in Wisconsin.

Why Lakes Are Important

Freshwater lakes have many important uses. Cities and towns depend on them for drinking water. In dry areas farmers use lakes to water their crops through irrigation systems. Lake water is used to create power in hydroelectric plants. Boaters and swimmers use lakes for recreation.

► More to explore

Glacier • Irrigation • Water

Lakota

► see Sioux.

Lamprey

Lampreys are fish that look like eels. They live in mild waters throughout the world, except in Africa. There are more than 20 species, or kinds, of lamprey. Some live in freshwater and others live in salt water.

Lampreys do not have bones or jaws. The skeleton is made up of a material called cartilage. Adults are about 6 to 40 inches (15 to 100 centimeters) long. They have one or two fins on the back and a single tail fin. They breathe through gill openings on the sides of the body. The mouth is round with horny teeth.

All lampreys hatch from eggs laid in freshwater. They begin life as wormlike organisms called larvae. After several years the larvae change form and



A lamprey (top) feeds on a rainbow trout.

become adults. This process is called metamorphosis.

As adults some lampreys become parasites. Parasites are organisms that live on or inside another organism to get what they need to live. The lamprey attaches itself by its mouth to the side of a fish. It makes a hole in the fish's body and sucks its blood and body fluids. The fish may or may not die.

Some lampreys stay in freshwater, but others swim out to sea. The lampreys that move into the sea return to freshwater to lay their eggs. Lampreys die soon after laying their eggs.

► More to explore

Eel • Fish • Parasite

Landslide

A landslide is a large amount of earth, rock, and other material that moves down a steep slope. Landslides happen when a layer of earth or rocks separates from the layer below it. The force of gravity pulls the loose layer downward.



A landslide destroyed part of a town near San Salvador, El Salvador, in 2001. An earthquake caused the landslide.

Landslides can be highly destructive. They can bury or sweep away everything in their path. They can block rivers or cover entire towns.

A landslide needs a steep slope to get its start. Rain, wind, waves, and other natural processes can wear away the surface of a slope. This wearing away, or erosion, can make a slope too steep to support the rocks and earth on top. Erosion can also loosen or weaken the material on a slope. This makes it easier for gravity to pull the material down the slope.

Besides erosion, other forces can lead to landslides. Rainstorms, melting snow, and earthquakes can weaken the material on a slope. Earthquakes, volcanoes, and the use of construction equipment or explosives can force material down a slope.

Rockfalls, mudflows, and avalanches are similar to landslides. A rockfall involves large rocks falling from the top of a slope or a cliff. A mudflow is a thick

stream of mud and other material that moves quickly downward. An avalanche is the sudden downward movement of snow or other material.

► More to explore

Avalanche • Erosion • Gravity

Language

Language is a system that people use to communicate, or share information. Language includes speaking, writing, and making gestures, or body movements. Early human ancestors began using spoken language several million years ago. Humans began writing about 5,000 years ago. Language made it possible for human societies to develop.

Humans are born with the ability to understand language. Without any special training, children learn to speak by listening to other people's speech. Other forms of language, such as writing and sign language, must be taught.



Three girls use language to communicate. Children usually begin to speak between ages 1 and 2. They understand some language even earlier.

Building Blocks of Language

The most basic part of language is a sound. Sounds can be combined into words, words can be combined into sentences, and so on.

Every language has several types of words. The most basic types of words are nouns and verbs. Nouns represent people, places, things, and ideas. Verbs describe action.

Every language has its own rules of grammar as well. These rules control the order of words in a sentence. The order of the words gives the sentence meaning.

Not all languages are spoken. In sign language, hand movements stand for letters, words, and sentences. Many people who use spoken language also communicate through gestures. For example, in many countries, nodding the head up and down means “yes.”

Languages of the World

There are thousands of languages throughout the world. Some are spoken by millions of people. Mandarin Chinese, English, and Spanish are the most widely spoken languages in the world.

Most countries have a standard, or official, language so that citizens can understand each other. Some countries have more than one standard language. Canada, for example, has two standard languages: English and French.

Many languages are related. People who study languages group related languages



A sign in the U.S. state of California says “polling place” in seven languages. English is at the top. Chinese, Japanese, and Korean are on the left. Spanish, Tagalog, and Vietnamese are on the right.

together. English, German, and Swedish belong to the Germanic group. French, Spanish, and Italian are called Romance languages. The Slavic language family of eastern Europe includes Russian and Polish. Chinese belongs to the Sino-Tibetan language family of Asia.

How Language Changes

At times people need to speak with others who do not know their language. For example, Europeans who came to the Americas hundreds of years ago needed a way to speak with Native Americans. Over time they began to use a simplified mixture of their languages. These mixtures are called pidgin languages. When a pidgin language replaces the original language of the group, it is called a creole language.

Even people who share the same language may develop different ways of speaking. People in different parts of a country may pronounce words differently or use local expressions. These varieties of the same language are called dialects.

Languages often blur together. Countries have borders, but languages and dialects do not. One language may borrow words from another language. Many English speakers use such words as pajamas (from Hindi), pasta (from Italian), karate (from Japanese), and fiesta (from Spanish).

Languages grow and change as people use them. People often shorten existing words. For example, “cellular phone” was shortened to “cell phone.” Also, people create new words all the time.

► More to explore

Communication • Grammar • Sign Language • Sound • Speech • Writing

Lansing



Population
(2000 census)
119,128;
(2007 estimate)
114,947

Lansing is the capital of the U.S. state of Michigan. Lansing itself was called Michigan until 1848. The city lies in a



Michigan's state Capitol is in a park in the center of Lansing.

shallow valley that is shaped like a cup. The Grand and Red Cedar rivers flow through the city.

The state Capitol stands in Capitol Square, in the center of the city. The building was completed in 1878.

Businesses that provide services are important to Lansing's economy. Many people there work in government, banking, insurance, computers, and education. Michigan State University is in the nearby city of East Lansing. Factories in Lansing make cars and other products.

Lansing was settled in the 1830s. In 1847 the state capital was moved to Lansing from Detroit. The site at that time was still mostly wilderness. In the early 1900s a company started to make cars called Oldsmobiles in Lansing. After that the city's industries began to grow.

► More to explore

Michigan

Laos



People can climb to the top of the Patuxai Arch in Vientiane, Laos, for a clear view of the city.

Laos is a country of Southeast Asia. It was once a powerful kingdom. Later it was ruled by Thailand and then France before regaining its independence. Vientiane is Laos' capital and largest city.

Laos borders China, Vietnam, Cambodia, Thailand, and Myanmar. The Mekong River forms part of Laos' western border. Lowlands lie along the



Mekong. Forested mountains cover the rest of the land.

Teak trees grow in the south. In the north are tropical rain forests. Elephants, tigers, leopards, monkeys, bears, and deer live in the forests.

Most of Laos' people live in rural areas. The Lao-Lum people form the largest ethnic group. The next largest groups are the Lao-Theung (or Mon-Khmer), the Lao-Tai, and the Lao-Soung. Most people are Buddhists or spirit worshippers. The main language is Lao.

Laos is a poor country with an economy based on farming. The chief crop is rice. Other crops include sugarcane, corn, sweet potatoes, and pineapples. Many people fish and raise pigs, water buffalo, and cattle. Laos also produces clothing, wood, coffee, and tin.

The rulers of Lan Xang (Kingdom of the Million Elephants) unified Laos in the 1300s. Later kingdoms fell under the rule of Siam (now Thailand). France ruled the region from the late 1800s.

Laos gained independence in 1954. In 1975 a Communist group called the Pathet Lao took control. The new government ruled harshly, and many people fled. A new constitution in 1991 gave the people more freedom.

► **More to explore**
Mekong River • Vientiane



Facts About LAOS



Population
(2008 estimate)
5,963,000

Area
91,429 sq mi
(236,800 sq km)

Capital
Vientiane

Form of government
People's republic

Major cities
Vientiane, Savan-nakhét, Pakxé, Xam Nua

La Paz



Population
(2001 census),
city, 789,585;
(2005
estimate), urban
area,
1,527,000

The South American country of Bolivia has two capitals: La Paz and Sucre. The country's president and lawmakers meet in La Paz. It is the administrative capital. The Supreme Court of Bolivia meets in Sucre, the legal capital.

La Paz is the highest national capital in the world. It lies more than 10,000 feet (3,050 meters) above sea level. Most of La Paz is located within a canyon.

La Paz is a center of business and industry. Many people in the city work in government and business offices, schools, hotels, stores, and banks. Factories in La Paz make processed foods, cloth, jewelry, and other goods.

Aymara Indians have long lived in the La Paz area. Hundreds of years ago the Inca had a village on the site. A Spanish conqueror founded the city in 1548. He named it Nuestra Señora de La Paz, which means "Our Lady of Peace." Spain ruled the area until 1825. In that year Bolivia became an independent country. La Paz became its administrative capital in 1898.

► More to explore

Bolivia • Sucre

Larch

Larches are trees that belong to the pine family. They are conifers, which means that they grow cones. Most conifers are evergreens, or trees that keep their leaves all year long. Larches are unusual because they shed their leaves in the autumn.

Larches grow mainly in cool areas in the northern half of the world. One species, or kind, of larch grows only in the Himalaya Mountains of southern Asia.



Skyscrapers line the streets of La Paz, Bolivia.



Larches' needle-shaped leaves change color and fall off in the autumn.

Larches have needle-shaped leaves that grow in clusters. New cones on the trees are bright red. Later the cones turn brown.

There are 10 to 12 species of larch. The most common North American larch is the eastern larch, also called the tamarack or hackmatack. It takes about 100 to 200 years for the eastern larch to become fully grown. In that time it may reach a height of 40 to 100 feet (12 to 30 meters). Two other kinds of larch, the western larch and the European larch, grow even taller. The European larch may grow as tall as 140 feet (42 meters).

The wood of larches is strong, hard, and heavy. It is used to make ships, telephone poles, and railroad ties.

► More to explore

Conifer • Pine • Tree

La Salle, Sieur de

The French explorer known as the Sieur de La Salle was the first European to

travel down the Mississippi River to the Gulf of Mexico. He claimed for France all the land that was drained by the river.

Early Life

La Salle was born on November 22, 1643, in Rouen, France. His original name was René-Robert Cavelier. In 1666 he went to Canada and traded for furs. Native Americans told him of a broad river that ran from the Great Lakes region to the sea. This was the Mississippi.

Explorations

In 1669 La Salle traveled south from Lake Ontario. He did not reach the Mississippi, but he may have reached the Ohio River. In 1673 he helped to build Fort Frontenac on Lake Ontario.



An illustration from the late 1600s shows the Sieur de La Salle at the coast of the Gulf of Mexico.



A map shows the route taken by the Sieur de La Salle down the Mississippi River. It also shows the route of La Salle's last, failed voyage.

In 1674 and 1677 La Salle visited France. King Louis XIV gave him the title of Sieur de La Salle, which means Sir La Salle.

In 1682 La Salle reached the Mississippi from the Illinois River. He floated all the way to the river's mouth at the Gulf of Mexico. There, on April 9, 1682, he claimed the entire Mississippi River valley for France. He named it Louisiana after his king.

Last Voyage

La Salle then returned to France. The king gave him permission to build a fort at the mouth of the Mississippi and to invade the Spanish land of Mexico.

La Salle's expedition set out from France planning to sail through the Gulf of Mexico to the mouth of the Mississippi. On the way, several of La Salle's ships were lost. Many men became ill. Worst of all, La Salle could not find the Missis-

issippi River. He finally landed at Matagorda Bay, in what is now Texas. His men grew so angry that they murdered La Salle on March 19, 1687.

► More to explore

Louisiana • Mississippi River

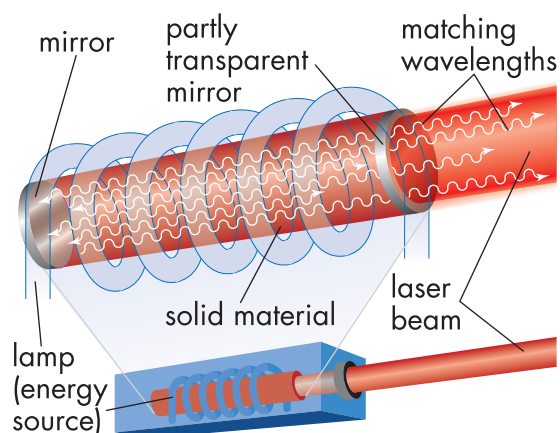
Laser

A laser is an instrument that can produce a powerful beam of light. The word laser stands for the scientific words that explain how a laser beam is produced: “*light amplification by the stimulated emission of radiation.*”

In the 1950s scientists in the United States and the Soviet Union came up with the ideas needed to build lasers. A U.S. scientist built the first laser in 1960. Since then scientists have built many more types of lasers.

How Lasers Work

A laser is usually made up of a tube with mirrors at both ends. One mirror is partly transparent (see-through). Inside



The light that escapes out of one end of a laser's tube is called a laser beam.

the tube is some type of material, such as gas, crystal, or liquid.

A powerful lamp or some other source of energy adds energy to the material. Then the material produces light. The light bounces back and forth between the mirrors at the ends of the tube. As it does so, it causes the material in the tube to produce more light. Some of this light escapes through the partly transparent mirror.

The escaped light is known as a laser beam, or laser light. Laser light is different from sunlight or light from a lamp, which is called white light. White light contains a mixture of all the wavelengths, or colors, of light. Laser light contains only one color. In addition, white light spreads out and gets weaker as it travels away from its source. Laser light travels from its source in a straight line. This helps it keep its strength over very long distances.

Uses

Construction workers and scientists use lasers to measure distances. Laser light can also carry telephone signals and other information over long distances. In this case it travels through special cables, called fiber-optic cables.

Doctors sometimes use laser beams instead of scalpels (knives) to cut into people. The energy of a laser beam can also close cuts without stitches.

Another common use of laser light is to make and read compact discs—CDs and

Did You Know?

Laser radar measured the distance from Earth to the Moon in the 1960s.

DVDs. Some types of computer printers use lasers, too.

► More to explore

Compact Disc • Energy • Fiber Optics
• Light

Latin America



Latin America is a region made up of Mexico, Central America, and South America. Some of the islands of the West Indies, in the Caribbean Sea, also are included. The area is known as Latin America because most people speak languages that came from Latin (the language of the ancient Romans). These languages include Spanish, Portuguese, and French.

People

Many Latin Americans have a mixture of American Indian, European, and African ancestry. Most people speak Spanish or

Portuguese. People in French Guiana and parts of the West Indies speak French. Millions of American Indians speak their native languages. Most Latin Americans are Roman Catholic.

History

American Indian peoples lived in what is now Latin America for thousands of years before Europeans arrived. These peoples included the Maya, the Aztec, the Inca, and many others.

In 1492 Christopher Columbus landed in the West Indies. This voyage marked the beginning of European exploration in the Americas. The Spanish conquered much of Latin America in the 1500s. Many American Indians died while fighting the Europeans or from the diseases they brought from Europe.

Eventually, Spain ruled Mexico, Central America, much of South America, and parts of the West Indies. Portugal ruled Brazil. France claimed what is now French Guiana and several islands in the



A Roman Catholic church in Guatemala is colorfully decorated. Latin America has a mixture of European and American Indian cultures.



A group of musicians plays together in Mazatlán, Mexico.

Caribbean. Many Europeans settled in these areas. They brought their languages, their Roman Catholic religion, and their culture to the region. Europeans also brought in many Africans as slaves.

Most of Latin America gained independence from Europe in the 1800s. But in many places in the region, people with European roots still held more power than people with American Indian or African ancestors.

► **More to explore**

Central America • Mexico • South America • West Indies

Latinos

► see Hispanic Americans.

Latitude and Longitude

Latitude and longitude are a system of lines used to describe the location of any place on Earth. Lines of latitude run in an east-west direction across Earth. Lines of longitude run in a north-south direction. Although these are only imaginary lines, they appear on maps and globes as if they actually existed.

Latitude

Lines of latitude (also called parallels) circle the Earth parallel to the equator. The equator is an imaginary line that lies halfway between the North Pole and the South Pole. It runs east-west all the way around Earth. Lines of latitude describe positions north and south of the equator.



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Lines of latitude run east and west.

Lines of latitude are measured in degrees ($^{\circ}$). Degrees are broken down into smaller units called minutes ($'$) and seconds ($''$). The equator is 0° . The North Pole is 90° north (N), and the South Pole is 90° south (S). Lines of latitude north of the equator are numbered from 1° to 89° N. Lines of latitude south of the equator are numbered from 1° to 89° S.

There are other important lines of latitude besides the equator. For example, the Arctic Circle ($66^{\circ} 30' \text{ N}$) and the Antarctic Circle ($66^{\circ} 30' \text{ S}$) surround the cold regions around the North and South poles. The area between the Tropic of Cancer ($23^{\circ} 27' \text{ N}$) and the Tropic of Capricorn ($23^{\circ} 27' \text{ S}$) is called the tropical zone or the tropics. It is known for its generally hot weather.

Longitude

Lines of longitude run between the North Pole and the South Pole. These lines are also called meridians. Like lines

of latitude, meridians are measured in degrees, minutes, and seconds.

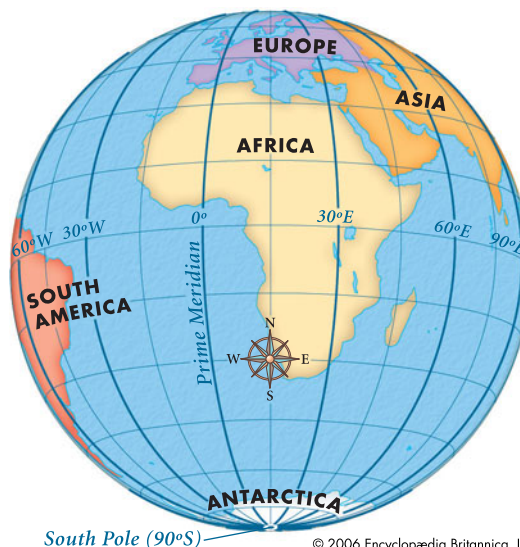
The north-south line that marks 0° longitude passes through Greenwich, England, in Great Britain. This is called the Greenwich, or prime, meridian. Other lines of longitude describe positions east and west of the prime meridian. Lines of longitude east of the prime meridian are numbered from 1° to 179° east (E). Lines of longitude west of the prime meridian are numbered from 1° to 179° west (W). The 180th meridian, or 180° , is the line of longitude exactly opposite the prime meridian.

How the Two Work Together

Latitude and longitude together can describe the exact location of any place on Earth. For example, Washington, D.C., lies 39 degrees north of the equator and 77 degrees west of the prime meridian. Its position is 39° N , 77° W .

► More to explore

Equator • Map and Globe



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Lines of longitude run north and south.

Latvia



A castle in Cesis, Latvia, was built by German knights in the 1200s.

The eastern European country of Latvia lies on the eastern shore of the Baltic Sea. For much of its history Latvia has been controlled by foreign powers. In 1991 it achieved independence from the Soviet Union. The capital is Riga.

Geography

Latvia is between the two other Baltic countries, Estonia (to the north) and Lithuania (to the south). Russia and Belarus are to the east. The land includes



flat lowlands and hills. Winters are cold, and summers are cool and rainy.

Plants and Animals

Forests cover much of Latvia. They are home to elk, boars, foxes, hares, lynx, badgers, and ermines (a type of weasel).

People

Ethnic Latvians, or Letts, make up more than half the population. They speak Latvian. Russians form the next largest group. More than half of the people are not religious; most of the others are Christians. Most people live in cities.

Economy

Services, including education, transportation, and banking, are the main economic activities. Manufacturing is also important. Latvia produces wood, metals, clothing, and machinery.

History

The first people in what is now Latvia were the ancient Balts. In the 800s the Vikings took control of the region. Germany, Poland, and Sweden later ruled. By the end of the 1700s Russia controlled all of Latvia.

In 1917 Latvia declared its independence. In 1940 the Soviet Union invaded. Latvia finally gained independence in 1991.

► More to explore

Riga • Union of Soviet Socialist Republics

Facts About LATVIA



Population
(2008 estimate)
2,266,000

Area
24,938 sq mi
(64,589 sq km)

Capital
Riga

Form of government
Republic

Major cities
Riga, Daugavpils,
Liepaja, Jelgava,
Jurmala

Laurel

Many types of flowering plant are known as laurels. The true laurel is a shrub or a small tree that is also called the bay laurel or sweet bay. It belongs to a large family of plants known as the laurel family. Some of the other plants called laurels belong to this family, but others are in different families.

Bay Laurel

The bay laurel first grew in regions around the Mediterranean Sea. Today it also grows in other parts of Europe and in the Americas. The bay laurel has stiff, fragrant leaves. It is evergreen, which means that it keeps its leaves year-round. The bay laurel also grows small, yellowish green flowers and green, purple, or black berries.

People use dried leaves of the bay laurel, called bay leaves, to flavor stews, sauces, and pickles. In ancient Greece the winners of athletic and poetry contests wore crowns of bay laurel.

Other Laurels

Like the true laurel, all the other plants known as laurels are evergreen. The Canary Island, or Azores, laurel is closely related to the true laurel. The California laurel is not as closely related, but it belongs to the laurel family.

Several plants in the heath family are known as laurels. They include the mountain laurel, the sheep laurel, and the pale laurel. These shrubs are highly poisonous to animals. Other laurels in



Small flowers bloom on a branch of bay laurel.

the heath family include ground laurel and great laurel.

Other plant families also include plants called laurels. The cherry laurel and the Portugal laurel belong to the rose family. The spurge laurel is in the thyme family. The Japanese laurel belongs to the dogwood family. The New Zealand laurel, or karaka, is related to holly.

► More to explore

Greece, Ancient • Plant

Law

All modern governments have sets of rules called laws. Laws are based on ideas about what is right and wrong. Governments punish people who do not obey laws. People who work with laws are called lawyers. The collection of all the laws in a country or a region is called the law.

Where Laws Come From

In the past, many laws were based on tradition, or the common practices of a

Did You Know?

The bay laurel was sacred to the ancient Greek god Apollo.

people. Other laws came from rulers or lawgivers. Units of government called legislatures make most modern laws. The United States and many other countries have several levels of legislatures—for example, local, state, and national. All of them make laws.

The United Kingdom and some other countries, including the United States, do not get all their laws from legislatures. They also get laws from the decisions of judges.

Branches of Law

There are two main branches of law: criminal and civil. Criminal law deals with crime. The government usually puts people accused of breaking criminal laws on trial in a court. If the court finds an accused person—called the defendant—guilty, he or she is pun-



A stone carving shows Hammurabi, the king of Babylon, standing before a god. Hammurabi created one of the first collections of written laws in about 1800 BC.

ished. Punishment may be a fine of money, a prison term, or death.

Civil law deals with disagreements between people. People file a lawsuit in a civil court if they think someone has treated them unfairly. The person who files the suit is called the plaintiff. Usually the plaintiff wants money from the other person—called the defendant.

History of Law

Hammurabi, the king of Babylon in Mesopotamia, created one of the first codes, or collections, of written laws in about 1800 BC. In the democracies of ancient Greece the citizens agreed on the laws that would govern them.

Many modern countries use either the English or the French system of law. Colonists brought English laws with them to North America and other places. In Europe and Latin America, many countries base their laws on the Napoleonic Code. The French emperor Napoleon I introduced this code of laws in 1804.

► More to explore

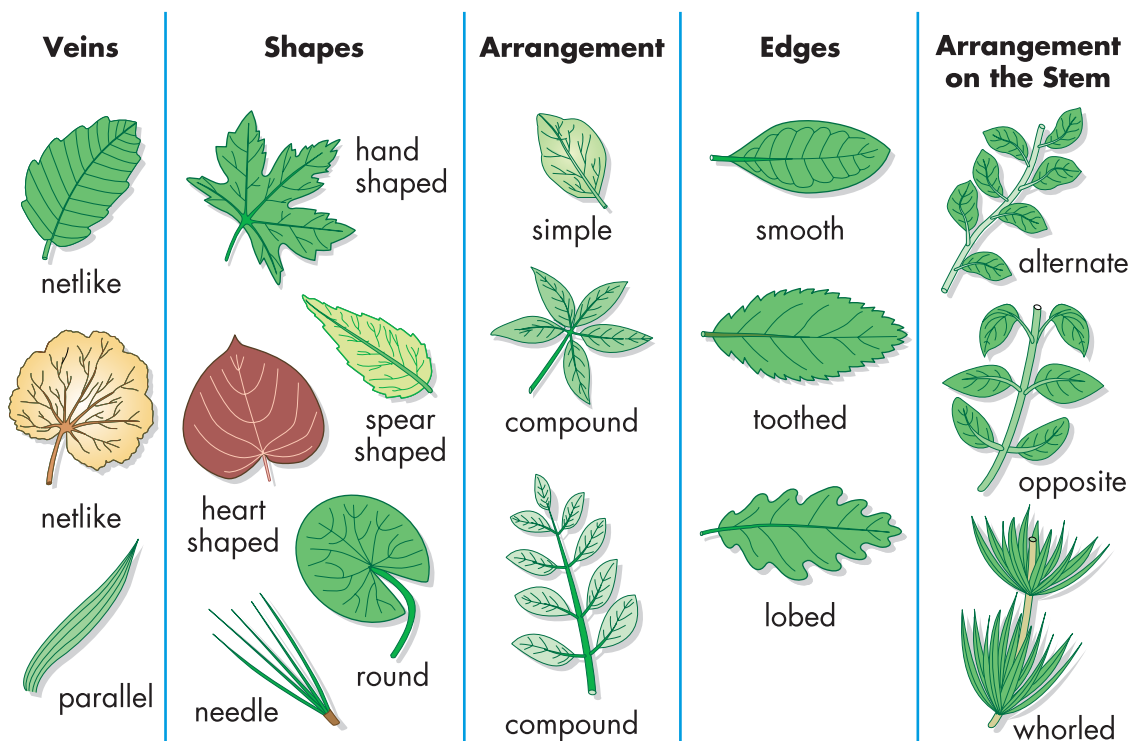
Crime • Government • Legislature

Leaf

The leaf is one of the most important parts of a plant. Leaves produce food for the plant through a process called photosynthesis. The leaves of different plants vary widely in size, shape, and color.

Did You Know?

Lawyers, also called attorneys, give people advice about laws. They also represent people, businesses, and governments during lawsuits.



Leaves come in many different shapes. They may grow in several different arrangements.

Structure

Most leaves have a broad, flat part called a blade. Usually, a stalk attaches the blade to the plant's stem. This stalk is called a petiole. A leaf that has only one blade is called a simple leaf. A compound leaf has two or more blades attached to the petiole.

Veins inside a plant's leaves work much like blood vessels inside an animal's body. They carry water and food to and from the leaves. Veins also provide the strong support that gives a leaf its shape. The veins of broad leaves usually form a netlike pattern throughout the leaf. Narrow leaves usually have veins that lie parallel to each other.

Different types of leaves may be rounded, oval, spear shaped, heart shaped, or triangular. Some leaves look

almost like fingers on a hand. Others are shaped like needles. Some leaves have smooth edges. Other leaves have tiny points, called teeth. Leaves may also have waxy or hairy coverings for protection.

Photosynthesis

Inside all leaves are substances called pigments, which give leaves their colors. Green leaves get their color from a green pigment called chlorophyll. Chlorophyll helps with the job of photosynthesis. It absorbs energy from sunlight. The leaves use this energy to make sugars, which are food for the plant.

Falling Leaves

Plants lose leaves and grow new ones throughout their lives. But many trees, called deciduous trees, shed all their leaves during cold or dry seasons. Trees

Did You Know?

Most plants twist and bend their leaves to face the sun. This helps them absorb more sunlight.

do this because they stop growing during these times.

In autumn or during a dry season, the leaves of deciduous trees lose their chlorophyll. As the leaves' green color fades, red, yellow, or orange pigments become visible. Meanwhile, a weak layer of cells develops at the base of each leaf's petiole. This weak layer causes the leaf to loosen and then fall off. The leaves grow back when the seasons change again.

► More to explore

Photosynthesis • Plant • Tree

League of Nations

The countries that won World War I (1914–18) set up an organization called the League of Nations. They wanted the League to be a place where countries could settle disagreements by talking instead of fighting. However, the League was not strong enough to keep World War II from breaking out in 1939.

The first meeting of the League of Nations was held in Geneva, Switzerland, in 1920. Representatives from 42 countries attended. More than 20 other countries joined later. U.S. President Woodrow Wilson wanted the United States to join the League, but the U.S. Congress disagreed. The United States never joined.



Representatives from many countries attend a League of Nations meeting in about 1930.

The League's goal was to prevent wars. The member countries agreed to discuss with the League any dispute that might lead to war. The members also agreed to act together against a country that was making trouble. In addition, the League tried to get countries to reduce their number of weapons.

In the 1920s the League settled several disputes between nations. In the 1930s, however, the League faced new challenges. Japan, Italy, and Germany invaded other countries. The League could not stop them. The invasions led to World War II.

The League's failure to prevent the war showed how weak it had become. The League did not meet during the war. After the war, in 1946, it was replaced by a new organization, the United Nations.

► More to explore

United Nations • Wilson, Woodrow
• World War I



Lebanon

The Middle Eastern nation of Lebanon lies on the eastern shore of the Mediterranean Sea. Lebanon has a large population for its small area. Problems between its Muslim and Christian people led to a long civil war that lasted from 1975 to 1991. Lebanon's capital and largest city is Beirut.

Geography

Lebanon borders Israel and Syria. Along the Mediterranean coast is a narrow plain. The Lebanon Mountains, which rise to 9,800 feet (3,000 meters), run down the middle of the country. The Anti-Lebanon Mountains form Lebanon's border with Syria. Between the two mountain ranges lies the high, fertile Bekaa Valley. The valley receives water from the Litani, the only river in Lebanon that flows throughout the year.

Lebanon's coast has warm, dry summers and mild, rainy winters. Summers in the



The city of Sidon, Lebanon, lies on the coast of the Mediterranean Sea. Christian knights built castles in Sidon in the 1200s.

Bekaa Valley are hot and dry, and winters are cool. Lebanon receives more rain than most Middle Eastern countries.

Plants and Animals

Lebanon was once heavily forested. But loggers cut down many trees over thousands of years. Today forests cover about 8 percent of the land. Among Lebanon's plants are brush and low trees, including oaks, pines, cypresses, firs, and junipers. Lebanon is famous for its cedar trees, but today they grow only in protected mountain groves.

Lebanon's animals include deer, wildcats, hedgehogs, squirrels, martens (small weasel-like mammals), and hares. Flamingos, pelicans, cuckoos, and various birds of prey also live there.



People

Most Lebanese are Arabs. There are small groups of Armenians and Kurds. Arabic is the main language, but many people speak English and French. Muslims make up more than half of the population. Most of the rest of the people are Christians. A smaller number of people are Druze—followers of a religion that combines elements of Islam, Christianity, Judaism, and other faiths. About 90 percent of Lebanese live in cities, mainly along the coast.

Economy

Services, including banking and tourism, are Lebanon's most important economic activities. Manufacturing is also important. Lebanon produces cement, food products, jewelry, clothing, machinery, chemicals, and wood products.

Agriculture is concentrated along the Mediterranean coast and in the Bekaa Valley. Major crops include potatoes, tomatoes, cucumbers, citrus fruits, onions, grapes, apples, and olives. Goats and sheep are the main livestock.

History

In early times the Phoenicians, Greeks, Romans, and Byzantines ruled what is now Lebanon. In 1516 the Turks made the region part of the Ottoman Empire. After World War I France governed Lebanon. The country became independent in 1943.

After independence, tensions grew between Christians and Muslims. In

1970 the Palestine Liberation Organization (PLO) moved its headquarters to Lebanon. The PLO launched attacks on Israel from Lebanon. Lebanese Muslims allied with the Palestinians against Israel and the Lebanese Christians. The Lebanese Muslims also wanted more power in Lebanon's Christian-dominated government.

In 1975 the conflict escalated into civil war between Muslims and Christians. The following year Syrian forces entered Lebanon to support the Christians. In 1982 Israeli forces also invaded. The Israelis and an international peacekeeping force helped to drive the PLO out of Lebanon. In 1984 the international peacekeepers left the country. Fighting between Lebanon's religious groups continued, however.

The civil war ended in 1991, but violence continued in southern Lebanon, especially between Israeli forces and the radical Muslim group known as Hezbollah. In 2000 Israel finally withdrew its forces from southern Lebanon. Syria pulled out its troops in 2005. About 300,000 Palestinian refugees remained in Lebanon, however.

In 2006 Hezbollah captured two Israeli soldiers. This led to heavy fighting between Israel and Hezbollah. Beirut and southern Lebanon were greatly damaged during the conflict.

► More to explore

Beirut • Middle East • Palestine Liberation Organization

Facts About LEBANON



Population
(2008 estimate)
4,142,000

Area
4,016 sq mi
(10,400 sq km)

Capital
Beirut

Form of government
Republic

Major cities
Beirut, Tripoli,
Sidon, Tyre (Sur),
An-Nabatiyah,
Juniyah

Lee, Robert E.



General Robert E. Lee is pictured in the uniform of the Confederate Army.

General Robert E. Lee led Southern armies during the American Civil War (1861–65). Even though his side had fewer soldiers and less money than the Union (the North), he scored many victories.

Early Life

Robert Edward Lee was born in Stratford, Virginia, on January 19, 1807. His father was Henry Lee, a hero of the American Revolution. Robert graduated from the U.S. Military Academy in 1829.

Career

Lee served for 36 years in the U.S. Army. He fought in the Mexican War (1846–48). He also captured John Brown, the leader of an antislavery revolt, in 1859.

In 1861 a group of Southern states formed their own government after separating from the United States. The new government was called the Confederacy. Virginia joined the Confederacy, and it soon became clear that the two sides were going to war. Lee wanted to defend his home state, so he left the U.S. Army. He took command of the Army of Northern Virginia in June 1862.

Lee won great victories in Virginia. One was the second battle of Bull Run (August 1862). Another was the battle of Chancellorsville (May 1863).

Lee invaded the North twice, but Northern forces stopped him both times. The second defeat—at Gettysburg, Pennsylvania, in July 1863—was a turning point in the war.

After Gettysburg, Lee defended northern Virginia. He finally surrendered to General Ulysses S. Grant at Appomattox Court House, Virginia, on April 9, 1865.

Later Years

Lee was a hero to Southerners even in defeat. He became president of Washington College at Lexington, Virginia. The school was later renamed Washington and Lee University. Lee died on October 12, 1870, in Lexington, Virginia.

► More to explore

American Civil War • Confederate States of America

Leg

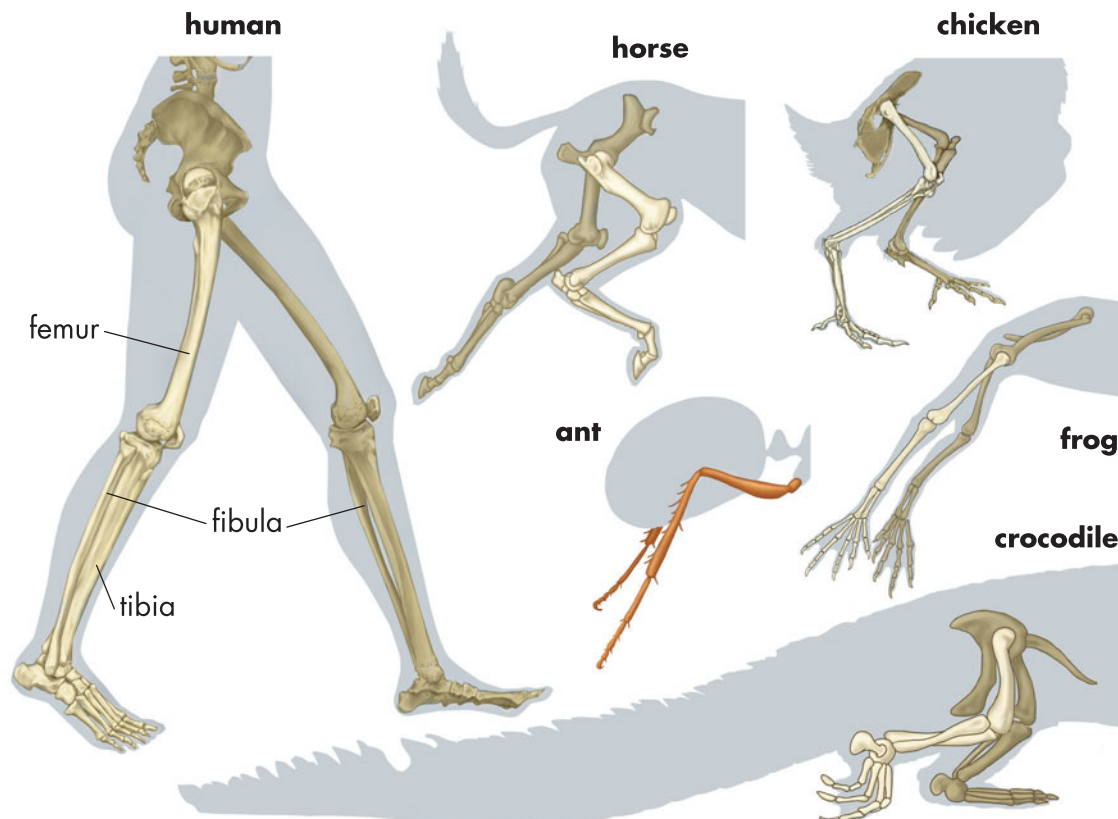
The limbs called legs support an animal's body and allow it to move. Animals use legs to walk, run, and jump. Humans have two legs. Other mammals, such as horses and cats, have four legs. Their two front legs are called forelegs, and their two back legs are called hind legs. Other animals have four, six, eight, or even hundreds of legs.

Legs of Mammals

The legs of all mammals share the same basic structure. A knee joint links the upper and lower segments of each leg. At the bottom of each leg is a foot. Muscles make the legs move. Bones make them strong.

On four-legged mammals, the legs are attached underneath the body. The hind legs of these mammals resemble the legs of humans. Three long bones are found in hind legs and in human legs: the tibia, the fibula, and the femur. The tibia and the fibula connect the ankle to the knee. The femur connects the knee to the pelvis.

The forelegs of four-legged mammals can be compared to human arms. Like arms, forelegs can hit, pull, and dig. But forelegs also support and move the body. The bone in the upper foreleg is called the humerus. The humerus connects the scapula (shoulder blade) to the knee. The radius and the ulna connect the knee to the ankle.



Most animals that live on land have legs. Legs support an animal's body and allow it to get around.

Legs of Other Animals

Amphibians, reptiles, and arthropods—which include insects, spiders, crustaceans, and centipedes—also have legs. Like mammals’ legs, most have muscles, joints, and segments. However, these animals’ legs are usually attached to the sides of the body, not underneath. Most amphibians and reptiles have four legs. Arthropods have from three to about 200 pairs of legs. Arthropods’ legs have a hard outer covering instead of bones inside.

Birds have two hind legs, also with muscles, bones, joints, and segments. They are located under the body. Instead of forelegs, birds have wings.

► More to explore

Arm • Bone • Foot • Knee • Muscle

Legislature

The group within a government that makes the laws is called a legislature. Republics and most modern monarchies have legislatures. States and provinces



Members of Israel’s legislature stand after hearing a speech by a foreign leader. The legislature is called the Knesset.

have them too. Old-fashioned monarchies do not need legislatures because the ruler makes the laws.

Many countries have adopted legislative systems similar to that of either the United States or Great Britain. The United States legislature is called Congress. Great Britain’s legislature is called Parliament.

The United States separates the legislative branch from the rest of the government. In the United States, the president is not allowed to be a member of Congress. In Great Britain it is different. The prime minister has to be a member of Parliament.

Many legislatures consist of two groups, or houses. In the United States and Great Britain, the lower house has members who are elected from districts. The residents of a district vote for a member to represent them. The upper houses are chosen by other methods.

Israel, like many other small countries, has a one-house legislature. Israel’s legislature is called the Knesset. There are no election districts. People vote for a party rather than a candidate. A party gets the same share of Knesset members as its share of the nationwide vote. This system allows small parties to have members in the legislature.

Legislatures may have other duties besides making laws. The U.S. Congress, for example, must approve officials and judges who have been appointed by the president. It also has the power to

remove government officials from office or to declare war.

► More to explore

Congress of the United States

• Government • Parliament

Legume

Legumes are flowering plants of the pea family. The pods, or fruits, of these plants are also called legumes. There are more than 18,000 species, or types, of legume. Some well-known legumes include beans, peas, peanuts, and soybeans.

Legumes grow all over the world. Most types grow naturally in warm or tropical areas. Most of the legumes that are valuable as crops are grown in mild climates.



Peas are legumes. The pods of a pea plant split open to release the seeds, or peas, inside.

Legumes can grow as herbs, vines, shrubs, or large trees. Most have soft green stems and flowers with five petals. The flowers later grow into pods, which hold the plant's seeds. Pods come in a variety of shapes, sizes, and textures. A pod releases its seeds by splitting open along two seams.

Legumes are an important source of food because they are high in protein. Beans, peas, and peanuts are legumes that people commonly eat. Soybeans are used to make such foods as tofu, soy milk, ice cream, and soy sauce. Soybeans are also used to feed livestock. Alfalfa and clover are used as livestock feed, too.

Legumes also are useful in improving the soil. They do this by adding nitrogen to the soil. Nitrogen is a nutrient that is important to all living things. The air has a lot of nitrogen, but most organisms cannot use it in that form. Most plants get their nitrogen from the soil. But legumes can take nitrogen from the air. In the roots of legumes, special bacteria turn the nitrogen into a form that plants can use. When legumes are plowed into the soil, they release nitrogen. Other plants can then take up the nitrogen through their roots.

► More to explore

Bean • Pea • Peanut • Plant

Leif Eriksson

Leif Eriksson was probably the first European to visit North America. He was a Viking. The Vikings were warriors

Did You Know?

The protein content of soybeans is twice as high as that of meat.



An illustration from the 1800s shows Leif Eriksson and his Viking ship at sea.

from northern Europe who traveled far by sea during the Middle Ages.

Leif was born on the island of Iceland sometime before AD 1000. He grew up on the nearby island of Greenland. His father, Erik the Red, had started a Viking settlement there.

There are two different tales of Leif's North American voyage. According to one tale, he got lost while on a mission to bring the Christian religion to Greenland. He landed on an unknown shore that he called Vinland because he saw grapevines there. Vinland might have been where Nova Scotia, Canada, is today.

According to a second tale, another Viking saw Vinland first and told Leif about it. In about AD 1000 Leif got together a group of explorers. The group reached Vinland and other places as well. Leif called one place Helluland. Helluland might have been the part of eastern Canada that is now called Labrador. Leif named another place Markland. Markland might have been the

island of Newfoundland. Many scholars believe the second tale is closer to the truth.

Leif returned to Greenland after his famous voyage. Other Vikings later started settlements in North America. Scientists have found traces of a Viking settlement on the island of Newfoundland. These settlements did not last long, however. They were gone long before the next group of Europeans arrived in the area in the late 1400s.

► More to explore

Americas, Exploration and Settlement of the • Vikings

Lemming

Lemmings are small rodents that resemble mice. They live in the northern parts of North America, Europe, and Asia. They are known for migrating, or



Lemmings usually live on their own or in small groups. But sometimes large numbers of lemmings gather together and move to a new area.

moving from place to place, in huge groups.

Lemmings are about 4 to 7 inches (10 to 18 centimeters) long, including the short tail. The body is chunky, which helps the animal stay warm in cold weather. The soft fur is grayish or reddish brown on top and lighter below. The fur gets thicker in winter to help keep them warm. Many lemmings living in the Arctic have fur that turns white in winter.

Lemmings live in holes that they dig in the ground. In winter they tunnel under the snow. Lemmings eat mosses, roots, and grasses.

Every three or four years the number of lemmings increases greatly. Scientists are not sure why. When the lemming population grows, some lemmings migrate to new areas.

Many people believe that lemmings purposely drown themselves during their migrations by plunging into the sea. This is untrue. In fact, lemmings try to avoid water. But sometimes a river or another body of water gets in their way. Then they might drown accidentally while trying to swim.

► More to explore

Migration, Animal • Rodent

Lemon

Lemons are tart, yellow fruits that grow on a small tree or spreading bush. Like limes, oranges, and grapefruit, lemons



Ripe lemons hang from a lemon tree.

are citrus fruits. The lemon plant's scientific name is *Citrus limon*.

Lemons grow in many warm regions of the world. Major lemon-growing countries include India, Argentina, Spain, Iran, and the United States. In the United States most lemons grow in California and Arizona.

Lemon trees grow to about 10 to 20 feet (3 to 6 meters) high. They produce sweet-smelling flowers that are white on top and reddish purple on the bottom. The fruits, or lemons, grow from these flowers.

Lemons are shaped like an oval with a bump on one end. Their rind, or skin, is thick. It starts out green and turns yellow when the fruit is ripe. Inside each fruit is juicy flesh called pulp.

The juice of lemons is tart because it contains a substance called citric acid. Lemon juice is rich in vitamin C as well. People use lemon juice to flavor pastries, pies, vegetables, fish, and many other foods. They mix it with water and sugar

to make lemonade, a popular warm-weather drink. People also use lemons to make fruit jellies, soaps, perfumes, and medicines.

► **More to explore**

Citrus Fruit • Grapefruit • Lime
• Orange

Lemur

Lemurs are mammals known for their large eyes and monkeylike bodies. They belong to the group of animals called primates, along with lorises, tarsiers, monkeys, apes, and humans. There are about 18 species, or types, of animal in the lemur family. But the term lemur also applies to about 50 related species, including dwarf lemurs, mouse lemurs, koala lemurs, indris, and aye-ayes.

Lemurs are found only on the islands of Madagascar and Comoros off the eastern coast of Africa. Most lemurs live in trees in forests. But the ring-tailed lemur lives in rocky areas.



A red-bellied lemur rests in a Madagascar rain forest. Lemurs use their long tails for balance while moving through the trees.

Most lemurs have foxlike faces and long back legs. They range in length from about 2.5 inches (6 centimeters) in one kind of mouse lemur to nearly 27.5 inches (70 centimeters) in the indri. This does not include the tails. The bushy tails of some lemurs are longer than their bodies. But the indri has a very short tail. The ring-tailed lemur is the only lemur with a striped tail. Most lemurs have a woolly coat that is mainly reddish, gray, brown, or black.

Lemurs are gentle and often social animals. Some species live in groups of 10 or more individuals. Most kinds are active at night and sleep during the day. Lemurs may eat fruits, leaves, buds, insects, and small birds and birds' eggs.

Loggers and farmers have cut down many trees where lemurs lived. Several species are now endangered, or at risk of dying out completely.

► **More to explore**

Endangered Species • Loris • Primate

L'Engle, Madeleine

The U.S. author Madeleine L'Engle wrote many books, including collections of poetry and novels for adults. She is best known, however, for many books she wrote for children. The most famous is a fantasy called *A Wrinkle in Time*. The book was published in 1962. The American Library Association honored the book with its Newbery Medal in 1963.

Madeleine L'Engle Camp was born on November 29, 1918, in New York City. As a writer she used only her first and middle names. She began making up stories while very young. Following her graduation from Smith College in 1941, L'Engle acted in theater. She published her first adult book, *The Small Rain*, in 1945.

L'Engle married Hugh Franklin in 1946. They soon moved to the country. Her first children's book, *And Both Were Young*, was published in 1949. While her children were young L'Engle did not publish many books. However, she kept on writing, and many of the books she wrote have to do with family ties. After *A Wrinkle in Time* L'Engle wrote more stories about the same family that she introduced in that book. Those books include *A Wind in the Door* (1973), *A Swiftly Tilting Planet* (1978), and *Many Waters* (1986). She also wrote another series for children about a family called the Austins. In addition L'Engle wrote plays, poetry, and books about herself.



Madeleine L'Engle

Lenin, Vladimir Ilich



Vladimir Ilich Lenin

The Russian leader Vladimir Ilich Lenin was the founder of the Soviet Union. The Soviet Union was the world's first Communist country.

Early Life

Lenin was born on April 22, 1870, in Simbirsk, Russia. His original name was Vladimir Ilich Ulyanov. At the time, Russia was ruled by a tsar. Many people were unhappy with the way the tsar treated them.

Vladimir studied law at the University of Kazan but was thrown out for joining a protest. He went home and read the writings of the Communist thinker Karl Marx. Marx wrote about a system in which the wealth of a society could be shared by all the citizens. Vladimir began to think about overthrowing the tsar to establish such a system.

Rise to Power

Vladimir became a lawyer in 1892. He also worked to spread Marx's ideas. Because of this, he was arrested in 1895 and sent to jail. In 1897 he was sent to Siberia (Russian Asia). In Siberia he lived near the Lena River. Afterward he began calling himself Lenin, after the name of the river.

In 1903 the Marxists (followers of Marx's ideas) split into two groups. Lenin took the side of the Bolsheviks (the majority) against the Mensheviks (the minority).

When World War I broke out in 1914, Lenin called for workers of all countries to change their own governments instead of fighting foreigners. In other words, he called for revolution.

In 1917 a revolution broke out in Petrograd (now Saint Petersburg), Russia. The Russian Revolution forced Tsar Nicholas II off the throne. Eventually the Bolsheviks took over, and Lenin became the head of a new, Communist government.

Communist Leader

Many Russians disagreed with Lenin's government. They fought a civil war with Lenin's troops, but Lenin's forces won the war. In 1922 the Soviet Union was formed.

Lenin was a powerful leader. He did not allow any disagreement with his government. But Lenin grew weak after he had

a series of strokes. He died after a final stroke on January 21, 1924.

► More to explore

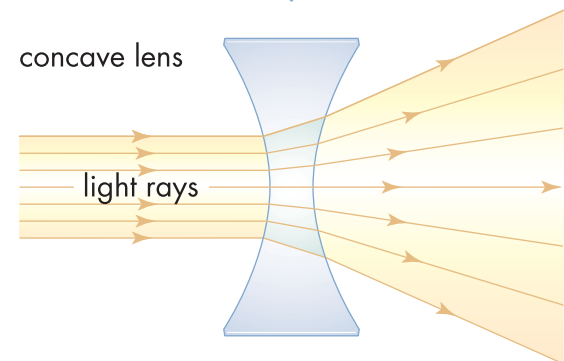
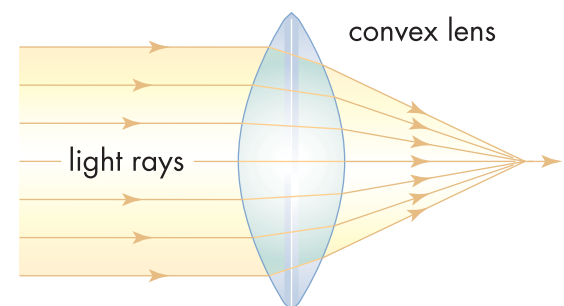
Communism • Russian Revolution
• Union of Soviet Socialist Republics

Lens

A lens is a piece of glass or other see-through material that is curved on one or both sides. It is usually in the shape of a circle. Lenses are used to bend light. This makes objects seen through a lens look bigger or smaller than they really are. Telescopes, binoculars, microscopes, cameras, and eyeglasses all have one or more lenses.

Concave and Convex Lenses

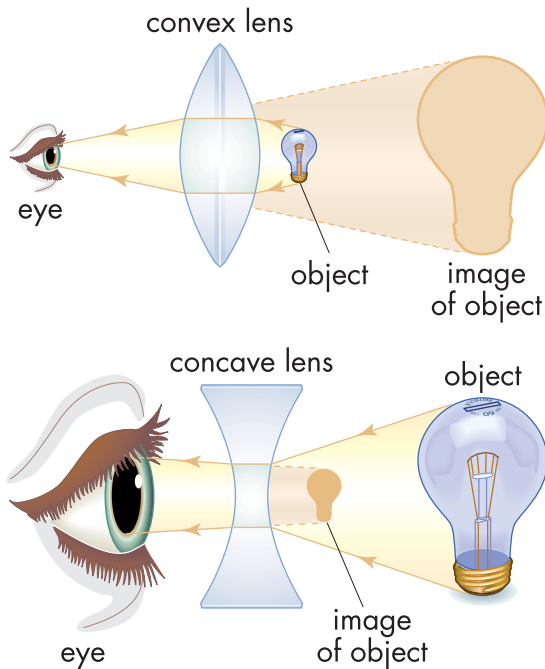
A concave lens curves inward. That means it is thinner in the middle than at



A convex lens bends light rays toward each other. A concave lens spreads light rays apart.

Did You Know?

After Lenin's death, the Russian city of Petrograd was renamed Leningrad. It was changed to Saint Petersburg in 1991.



A convex lens makes objects look larger and farther away. Convex lenses correct farsightedness. A concave lens makes objects look smaller and closer. Concave lenses correct nearsightedness.

the edges. When light passes through a concave lens, the light rays bend so that they spread apart. Concave lenses make objects look smaller and closer.

A convex lens curves outward. It is thicker in the middle than at the edges. When light passes through a convex lens, the light rays bend toward each other. The rays meet at a single point on the other side of the lens. Convex lenses make objects look larger and farther away.

The Lens of the Eye

The eye contains a lens that bends light rays so that they meet exactly on a part of the eye known as the retina. The shape of the lens changes to allow the eye to see objects at different distances.

If the lens does not bend light rays properly, the result is nearsightedness or farsightedness. Nearsightedness makes faraway things look blurry. It can be corrected by wearing eyeglasses with concave lenses. Farsightedness makes close-up things look blurry. It can be corrected by wearing eyeglasses with convex lenses. The lenses of both types of eyeglasses bend light rays so that they meet on the retina.

► More to explore

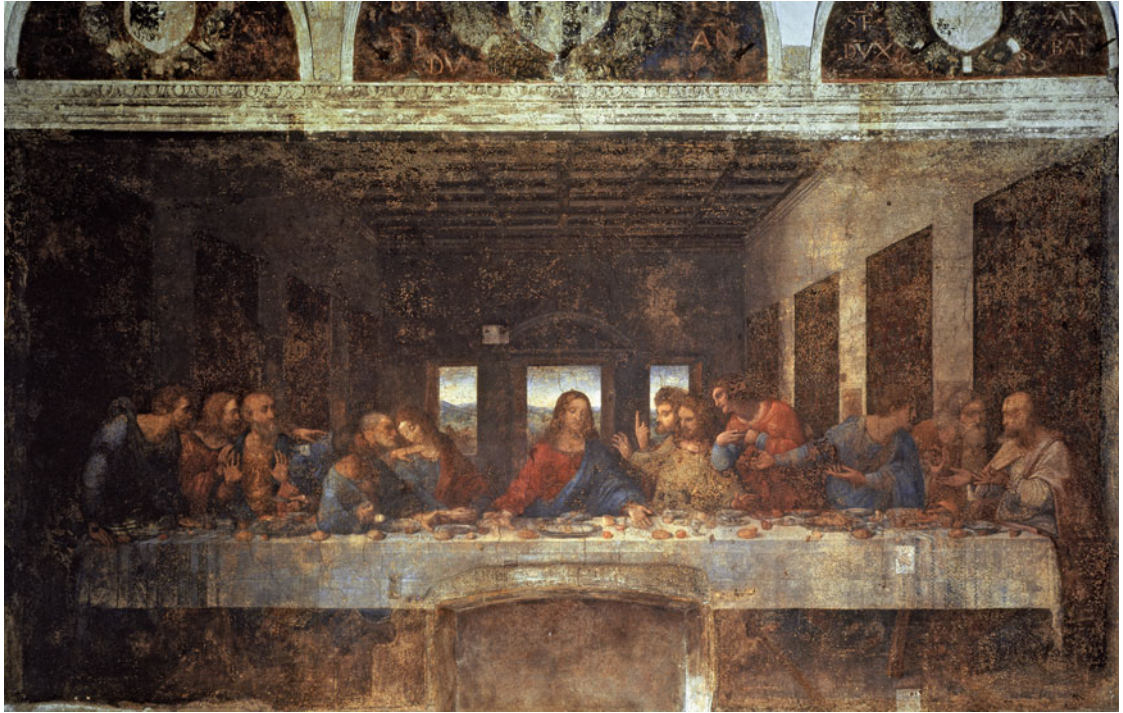
Eye • Light

Leonardo da Vinci

Leonardo da Vinci was a genius in many fields. He excelled at painting, drawing, sculpture, architecture, and engineering. He was a leading figure of the Italian Renaissance, a period of



A self-portrait by Leonardo da Vinci shows how he looked in 1512.



Leonardo da Vinci painted *The Last Supper* on the wall of a monastery in Milan, Italy.

great achievement in the arts and sciences. Leonardo's paintings *Mona Lisa* and *The Last Supper* won him great fame. But he is also well known for his scientific studies.

Early Life

Leonardo da Vinci was born on April 15, 1452, near Vinci, in what is now Italy. When he was about 15 he began studying with the artist Andrea del Verrocchio in Florence. Verrocchio taught him about painting, sculpture, and the design of mechanical devices.

Paintings and Notebooks

Leonardo worked in Milan as a painter and engineer for a duke from 1482 to 1499. Although he completed only six paintings during that time, they include two masterpieces: *The Last Supper* and *The Virgin of the Rocks*.

While in Milan Leonardo also became interested in observing nature. He thought that by carefully observing objects and accurately drawing them, an artist could obtain scientific knowledge. Leonardo recorded his observations in a series of notebooks. The notebooks cover a variety of subjects, including painting, architecture, machinery, the structure of the human body, and the science of flight. For example, more than 300 years before flying machines were perfected, Leonardo developed plans for an airplane and a helicopter.

Later Years

In 1503 Leonardo returned to Florence. There he continued his scientific studies and worked on four great paintings, including the *Mona Lisa*. He spent some of his later years in Milan and Rome. In 1516 he moved to Cloux (now Clos-Lucé), France, to work for the French



In about 1490 Leonardo da Vinci drew plans for a flying machine.

king. He spent most of his time there editing his writings. Leonardo died in Cloux on May 2, 1519.

► More to explore

Painting • Renaissance • Science

Leopard

The leopard is a wild cat of Africa and Asia. It is known for its spotted coat. Leopards are sometimes called panthers. The scientific name of the leopard is *Panthera pardus*.

An average leopard weighs between 110 and 200 pounds (50 to 90 kilograms). It is about 7 feet (2 meters) long, not including the long tail. Some leopards grow much larger.

Most leopards have yellow fur on the back and white fur underneath. Dark spots cover much of the body. The size and spacing of the spots are different in different types of leopard. The leopard

called the black panther has a black coat on which the spots barely show.

Leopards can live in a variety of habitats. They are found in forests, deserts, grasslands, mountains, and rocky places. They are skilled climbers and good swimmers.

Leopards live alone. They come together only to mate. The female gives birth to two to four babies, called cubs. The cubs go off on their own after about two years.

Leopards are fierce predators that hunt mainly at night. They hunt antelope, deer, dogs, and baboons. Leopards also eat cattle and may attack humans. Sometimes they drag their prey high into a tree to protect it from other animals.

In some places leopards are endangered, or at risk of dying out. Some people hunt leopards for sport and for fur. Other people have taken over the leopard's habitat.

► More to explore

Cat



Leopards were once known as pards. People today sometimes call them panthers.



Lesotho

The Kingdom of Lesotho is entirely surrounded by the country of South Africa. Lesotho's capital is Maseru.

Geography

Mountain ranges cover about two thirds of Lesotho. In the west is a flatter region. The Orange and Tugela rivers, two of southern Africa's largest waterways, have their sources in Lesotho's mountains. Lesotho has hot summers and cold winters.

Plants and Animals

Overgrazing and erosion have largely destroyed the natural grasslands of Lesotho. The country's other vegetation includes Cape willow trees, wild olive trees, and aloe plants. Lesotho's animals include small antelope, hares, and a few leopards.

People

Most of Lesotho's people belong to the Sotho ethnic group. A smaller number



The Sotho people of Lesotho traditionally live in small round houses.

of people are Zulu. Sotho and English are the two main languages. Nearly everyone is Christian. Most of the population lives in rural areas.

Economy

Lesotho sells water and electricity to South Africa. Its factories make food and clothing. Construction, diamond mining, and tourism are other important industries. Many of Lesotho's people work in South Africa or as farmers. Farmers raise sheep and goats and grow corn, potatoes, wheat, and beans.

History

For thousands of years Lesotho was the hunting ground of the San people, or Bushmen. In the 1800s the Sotho people took control of the region. In 1871 the British made the land a colony known as Basutoland. The Kingdom of Lesotho gained independence in 1966.

► More to explore

Maseru • South Africa

Facts About LESOTHO



Population
(2008 estimate)
2,020,000

Area
11,720 sq mi
(30,355 sq km)

Capital
Maseru

Form of government
Constitutional monarchy

Major urban centers
Maseru, Teyateyaneng, Maputsoe, Hlotse, Mafeteng



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Lettuce



The center leaves of a head lettuce plant grow in a tight, round cluster.

Lettuce is the most widely planted salad vegetable. There is only one species, or type, of lettuce. Its scientific name is *Lactuca sativa*. It belongs to the same large plant group as daisies and dandelions.

Farmers in many parts of the world grow lettuce. It grows best in mild weather. High heat can keep lettuce from growing to its full size and can make the leaves taste bitter. Lettuce needs plenty of water, but too much water can cause it to lose its crispness.

Lettuce has shallow roots and large leaves. It grows in four different forms: head, leaf, romaine, and stem. The leaves of head lettuce are folded into a ball. Leaf lettuce has a cluster of curled leaves. Romaine lettuce has tall, smooth leaves. Stem lettuce has narrow leaves and a thick stem.

If lettuce is left to grow, it produces a long, slender stalk. Small yellow flowers

grow on this stalk. Farmers usually take lettuce from the field before it grows flowers. Lettuce must be eaten soon after being harvested.

Lettuce is a healthy food choice. It is almost 95 percent water, so it is low in calories and fat. It also contains fiber and some vitamins. Lettuce adds flavor and crunch to salads and sandwiches. People cook stem lettuce in stews and in many Asian dishes.

► More to explore

Leaf • Plant • Vegetable

Levee and Dike

Like dams, levees and dikes have a simple but important job: they hold back water. People build levees to keep rivers or lakes from flooding low-lying land during storms. Dikes are often built



A levee divides rice paddies (wet growing areas) in Japan. The levee also holds the water away from nearby houses.

Did You Know?

In 2005 Hurricane Katrina damaged levees protecting New Orleans, Louisiana, which caused terrible flooding in the city.

to reclaim, or take back, land that would naturally be underwater. For example, dikes may be used to create a new area of dry land along a seacoast. Levees and dikes look alike. Sometimes the words levee and dike are used to mean the same thing.

Structure

Levees and dikes can be made of dirt, cement, or stacked stones. They are built along the edges of the body of water they hold back. They must be wide enough so that they will not collapse or wear away under pressure from the water. The tops of levees and dikes made of dirt are often planted with grass to help hold the dirt together.

History

Levees and dikes have been built for thousands of years. The ancient Egyptians built levees for more than 600 miles (966 kilometers) along the Nile River. People in ancient Mesopotamia and China also built levees. One of the largest modern systems of levees runs along the Mississippi River in the United States. These levees extend from southern Missouri to the Gulf of Mexico, a distance of about 1,000 miles (1,600 kilometers).

The most famous system of dikes is in The Netherlands. Much of the country's land was once underwater. Since the 1200s people have built dikes to reclaim land from the sea. First they built dikes out in the sea. Then they pumped out the water between the dikes and the natural shoreline. More than 2,500 square miles (6,500 square

kilometers) of The Netherlands is reclaimed land.

► More to explore

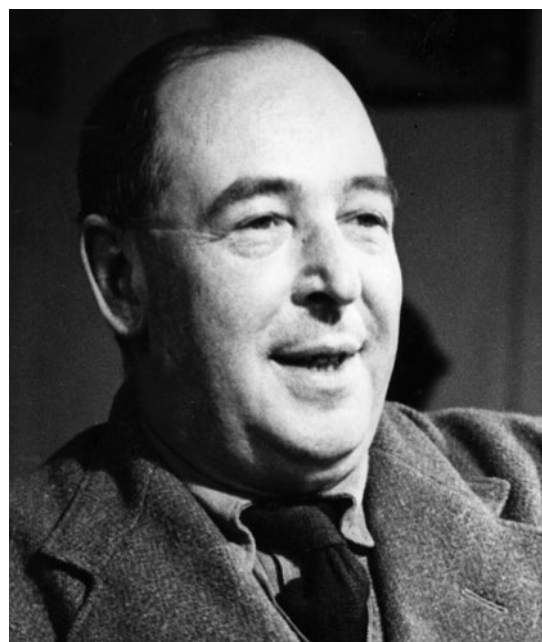
Dam • Flood • Netherlands, The

Lewis, C.S.

The British writer C.S. Lewis is famous for writing a series of books called *The Chronicles of Narnia*. Lewis wrote many other books, including poetry, science fiction, and books about Christianity.

Clive Staples Lewis was born on November 29, 1898, in Belfast, Ireland. As a child, he missed a lot of school due to illness. In 1916 he went to University College in Oxford, England. He left school for a time to fight in World War I with the British Army. After college, he became a teacher.

Lewis published many books throughout his teaching career. Some were about



C.S. Lewis

the subjects he taught. He also wrote about being a Christian. One of his most well-known Christian books is called *The Screwtape Letters*. It was published in 1942. It is a humorous story about devils trying to tempt a young Christian.

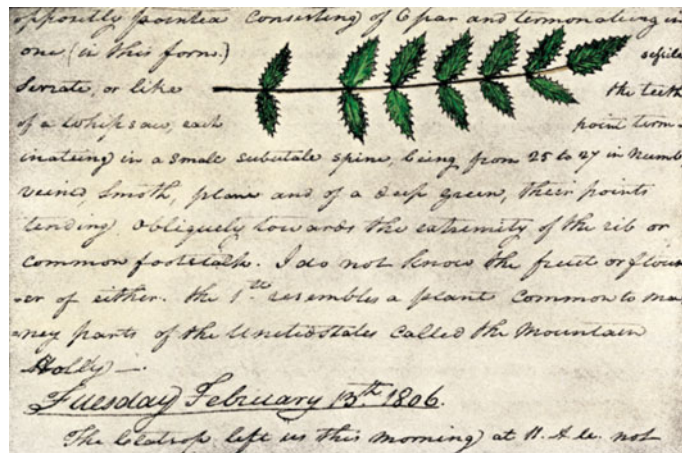
In 1950 Lewis wrote one of his most famous books. It was a children's book called *The Lion, the Witch, and the Wardrobe*. This book was the first of the series called *The Chronicles of Narnia*. The seven books tell the story of four brothers and sisters. They discover a magical world called Narnia, where they have many adventures.

C.S. Lewis died on November 22, 1963. He had retired from teaching the summer before.

Lewis and Clark Expedition

Between 1804 and 1806 a group of U.S. soldiers and explorers traveled from the Mississippi River to the Pacific coast and back. The leaders of this expedition, or journey, were Meriwether Lewis and William Clark.

In 1803 the United States had bought a huge territory west of the Mississippi River. It was called the Louisiana Territory. President Thomas Jefferson sent Captain Meriwether Lewis to find out what was there. Lewis chose Lieutenant William Clark to share the leadership.



Lewis and Clark kept journals during their expedition. In the journals they made sketches and took notes about everything that they observed during their journey.

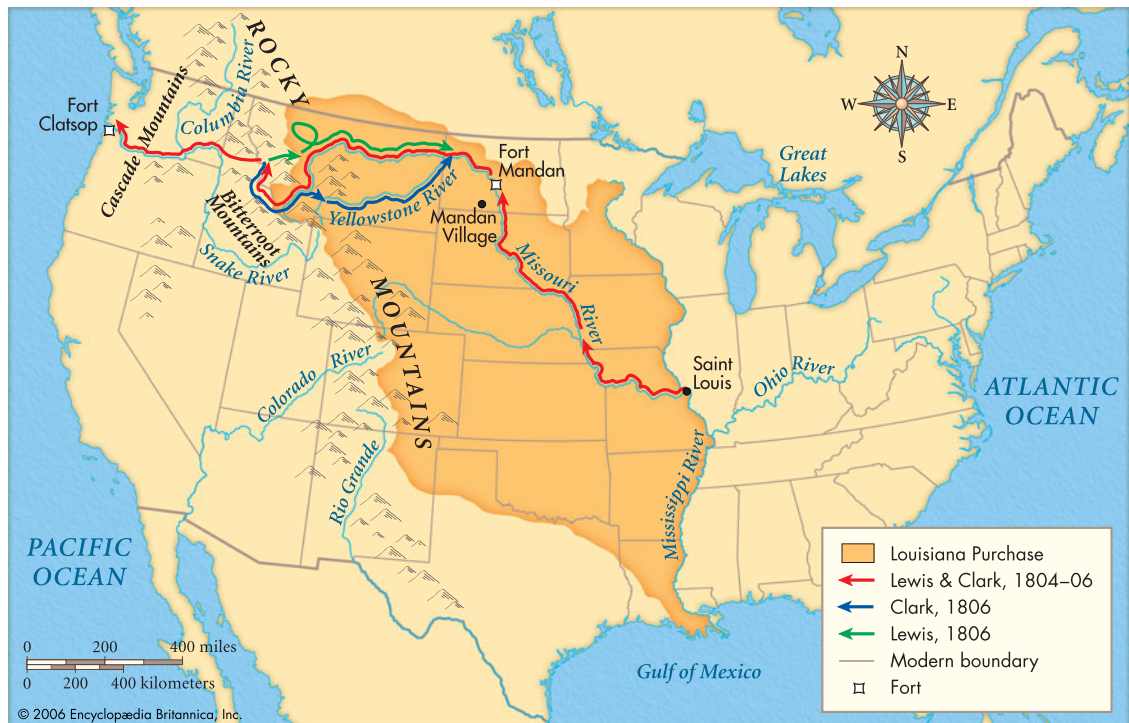
Lewis and Clark chose men who knew how to live in the wilderness to go with them.

Westward Bound

Home base for the group was near what is now Saint Louis, Missouri. On May 14, 1804, the men started up the Missouri River in three boats. On August 3 they had their first meeting with Native Americans, near what is now Council Bluffs, Iowa.

The group spent the winter in what is now North Dakota, among the Mandan Sioux. There a young Native American woman named Sacagawea joined the expedition. Sacagawea was very helpful to the explorers. She knew which plants were good to eat. She also knew Native American languages.

In the spring of 1805 the explorers continued up the Missouri to its source, in what is now southwestern Montana. They then followed another river, the



Jefferson, westward into the Rocky Mountains.

The group was now in the land of Sacagawea's people, the Shoshone. As a child Sacagawea had been kidnapped and taken away from her home. The explorers met her brother, who was a chief. He gave the explorers horses and a guide to help them cross the Bitterroot Range of the northern Rocky Mountains.

The group then left the horses behind and made the rest of the trip by river in canoes they built. They finally reached the Pacific Ocean on November 15, 1805. They had traveled more than 4,100 miles (6,600 kilometers). They built a stockade called Fort Clatsop a few miles from the coast, south of what is now Astoria, Oregon. They spent the rainy winter there.

Homeward Bound

The return trip began on March 23, 1806. The group crossed the Rocky Mountains in June. Clark then followed the Yellowstone River to the Missouri. Lewis went northeast to explore the Marias River. There the expedition had its only fight with Native Americans. Two members of the Blackfoot tribe were killed.

The party reunited downriver. The men left Sacagawea and her family at the Mandan villages. The explorers reached Saint Louis on September 23, 1806.

Lewis and Clark brought back diaries and maps. These provided much information about the land, plants, animals, and people of the western territory.

► More to explore

Americas, Exploration and Settlement of the • Louisiana Purchase • Sacagawea

Liberia

The oldest republic in Africa is Liberia, whose name means “land of the free.” Freed U.S. slaves settled the country in the 1820s. The capital and largest city is Monrovia.

Liberia borders Sierra Leone, Guinea, and Côte d'Ivoire. The Atlantic Ocean lies to the southwest. Along the coast are low, sandy plains. Farther inland are hills and low mountains.

Tropical rain forest covers about one fifth of Liberia. The country's rich wild-life includes monkeys, chimpanzees, antelope, and rare pygmy hippopotamuses.

Liberia's many ethnic groups include the Kpelle, the Bassa, the Grebo, the Gio, the Kru, and the Mano peoples. People descended from U.S. slaves form a small group. The common language is English, but different groups have their own languages. Most people practice



Liberian president Ellen Johnson-Sirleaf gives a speech. In 2005 Johnson-Sirleaf was elected the first woman president in Africa.

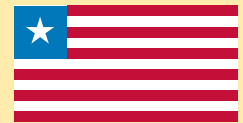
traditional African religions, but there are many Christians and Muslims.

Liberia is a poor country. Most people grow rice, cassava, and vegetables and raise livestock for their families. Liberia also produces natural rubber, coffee, cocoa, and palm oil. Its natural resources include iron ore, diamonds, and timber.

African peoples lived in what is now Liberia when the first European explorers reached the coast in the 1400s. In the early 1800s the land was chosen as a home for freed U.S. slaves. Liberia became an independent republic in 1847.

In 1980 the military overthrew the government. In 1989 rebels began a brutal civil war. The war finally ended in 2003.

► **More to explore**
Monrovia



Facts About LIBERIA



Population
(2008 estimate)
3,543,000

Area
37,743 sq mi
(97,754 sq km)

Capital
Monrovia

Form of government
Transitional government

Major cities
Monrovia,
Zwedru, Buchanan,
Yekepa,
Harper

Liberty, Statue of



The Statue of Liberty stands on Liberty Island in New York Bay, in the United States.

Since 1886 the Statue of Liberty has stood in New York Bay as a symbol of the United States. The statue has welcomed millions of people to the country.

The Monument

The Statue of Liberty stands on Liberty Island, just off the southern tip of Manhattan Island, a part of New York City. The statue is about 151 feet (46 meters) tall. With its concrete base, it stands 305 feet (93 meters) high. The statue is made of thin sheets of pounded copper. A steel framework supports the copper.

The formal name of the statue is *Liberty Enlightening the World*. Liberty is shown in the form of a woman wearing a crown. The light comes from a torch she holds.

The base displays a poem by Emma Lazarus entitled *The New Colossus*. It reads:

Give me your tired, your poor,
Your huddled masses yearning to
breathe free,
The wretched refuse of your teeming
shore.
Send these, the homeless, tempest-
tost to me,
I lift my lamp beside the golden door!

History

The statue was a gift from the people of France. The French sculptor Frédéric-Auguste Bartholdi designed the statue. Workers in France completed it in 1884. The statue was then taken apart and shipped to the United States, where it was reassembled on its base. The base was designed in the United States.

The statue became a national monument in 1924. Workers fixed it up for its 100th birthday in 1986. They repaired the metal and applied new gold to the flame of the torch. A museum in the base of the statue is open to visitors.

Liberty Bell

In Philadelphia in 1776, the Liberty Bell rang to announce the independence of the United States from Great Britain. At that time, however, the bell was not called the Liberty Bell. People who wanted liberty, or freedom, for slaves gave the bell its name in 1839.



The Liberty Bell hangs in Liberty Bell Center in the U.S. city of Philadelphia, Pennsylvania.

The Liberty Bell is mostly copper and tin. It is 3 feet (91 centimeters) high and 12 feet (3.7 meters) around at the bottom. It weighs about 2,080 pounds (943 kilograms). A large crack runs down one side. On the bell is a verse from the Bible (Leviticus 25:10): “Proclaim liberty throughout all the land unto all the inhabitants thereof.”

The Pennsylvania Provincial Assembly (the colony’s group of lawmakers) ordered the bell from Britain in 1751. In June 1753 it was hung in the steeple of the assembly’s building. People rang the bell to announce meetings and public gatherings.

Officials rang the bell on July 8, 1776, to announce the first public reading of the Declaration of Independence. During the American Revolution, patriots hid the bell from British soldiers. The

British might have melted it down to make cannonballs.

After the war, the bell went back to the assembly building—which was renamed Independence Hall. The bell cracked in 1835. The crack got bigger in 1846. Since then, the bell has not rung. In 2003 the bell was moved to a new building, called Liberty Bell Center, near Independence Hall.

► More to explore

American Revolution

Library

A library is a collection of resources that provide information and entertainment. A library has books, newspapers, magazines, films, audio recordings, and computer software. Workers called librarians keep the resources in order and show people how to find and use them. Most



A boy in a library chooses several books to read.

libraries lend materials to people who have a library card.

Types of Libraries

Cities and counties run public libraries. A public library system may have many branches, or locations, in different neighborhoods. Public libraries offer a library card to anyone who lives in the area. Most public libraries have computers that people can use for free. Many public libraries also offer special services for children, such as story hours.

Most elementary and high schools have libraries. School libraries offer many of the same resources as public libraries. But they focus especially on meeting the needs of students and teachers. School librarians work closely with teachers to make sure that they have the most useful educational materials.

College and university libraries also serve teachers and students. But they usually are much larger than elementary and high school libraries. Sometimes they have millions of books. These libraries often have books in many languages. Sometimes they have rare and very old books, too.

Organizations such as hospitals, museums, churches, and companies might have their own libraries. Most are open to employees or members only.

Countries have libraries called national libraries. Most national libraries keep a copy of every book that is published in their country.

Using the Library

Most libraries have books on all kinds of subjects, from history to science to the arts. They have novels, plays, storybooks, and poetry books, too. The books are organized by subject and type. For example, all the books about music are in one area, and all the poetry books are in another area. Libraries often have a special section where all the children's books are kept.

Most of the books in a library can be checked out and taken home. But most libraries also have books that cannot be removed from the library. These books are in an area called the reference section. This section includes dictionaries, encyclopedias, atlases, and almanacs.

Librarians keep track of the library's collection by marking each item with a number called a call number. These numbers tell where items can be found on the shelves. Librarians give call numbers to items based on different systems for arranging them by subject or type.



A librarian explains to some students how to find the information they need.

Did You Know?

In the 600s BC the library of Nineveh, in Mesopotamia, held more than 25,000 clay tablets.

Many librarians use the Dewey Decimal System. In this system there are 10 main subjects. Each of these subjects is divided into 10 smaller sections. And those smaller sections are further divided into even smaller parts. Each number in the Dewey system has at least three digits to show these divisions. For example, geography and history books are numbered from 900 to 999. Books on the history of North America are numbered from 970 to 979. And books on the history of the United States are numbered 973. Some numbers also have a decimal point and more digits to divide the subject even further.

A library user can find an item's call number by looking in the library catalog. One kind of catalog is called a card catalog. A card catalog is a file of printed cards that list call numbers and other information about library items. A person can find a book by looking for the card filed under its author's name, its title, or its subject. Most libraries today have replaced their card catalogs with electronic catalogs. Library users can search an electronic catalog on computers in the library.

History

The first libraries were collections of official documents, or records. The most famous library in the ancient world was in Alexandria, Egypt. During the Middle Ages (AD 500 to 1500) monks in Europe copied books by hand. Libraries grew rapidly after printed books became available in the late 1400s. Today the

largest library in the world is the Library of Congress, in the United States.

► More to explore

Book and Bookmaking • Storytelling

Libreville



Population
(2003 estimate),
metropolitan
area, 661,600

Libreville is the capital of Gabon, a country in western Africa. It is Gabon's largest city. Libreville has a port on the Atlantic Ocean.

Many people in Libreville work for the government. The port is also important to the economy. Ships load up there with lumber and minerals. Shipbuilding also brings money to the city.

A people called the Pongoue settled in the Libreville area in about the 1500s. The Fang moved there in the 1800s. The French founded Libreville in 1849 as a settlement for freed slaves. The name Libreville means "free town." In 1960 Gabon became an independent country with Libreville as its capital. Oil was discovered off the coast near the city in the 1970s.

► More to explore

Gabon

Did You Know?

The Library of Congress was founded in 1800.

Libya

Libya is a country in North Africa. Large amounts of oil have brought wealth to the country. Tripoli is Libya's capital and largest city.

Geography

Libya borders Tunisia, Algeria, Niger, Chad, Sudan, and Egypt. The Mediterranean Sea lies to the north.

Libya is within the Sahara, the world's largest desert. Bare rock and sand make up almost all of the country's land. There are some oases, or small areas of green land, in the desert. Most of the people and farms are in the northwest, near the coast. Mountains rise in the northeast.

Most of Libya is hot and dry. Only the coast has a cool, rainy winter. Libya's riverbeds are dry most of the year. The country mines some underground water in the desert and pipes it to the coastal



Metal objects and other goods are for sale at a shop in Tripoli, Libya.

cities. This large project is called the Great Man-Made River.

Plants and Animals

There are few natural plants in Libya. The country's animals include desert rodents, hyenas, foxes, jackals, gazelles, and wildcats. Eagles, hawks, and vultures are common birds.

People

Most of Libya's people are Arabs. Berbers were once the main people. Today most Berbers have adopted Arab culture. There are small groups of other Africans, Italians, Greeks, and other peoples. Arabic is the main language. Most Libyans are Muslims who belong to the Sunnah branch of Islam.

Economy

Libya's economy is based on oil, which Libya sells to other countries. Libya also



has supplies of natural gas and iron ore. Many people work in services, including government work, health care, and banking. Factories produce chemicals, metals, food products, and cement.

Agriculture is a smaller part of the economy. Libya's crops include watermelons, potatoes, onions, olives, tomatoes, and dates. Farmers also raise sheep and goats.

History

Many different groups—including Africans, Greeks, and Phoenicians—ruled parts of Libya in ancient times. The ancient Romans made the region part of their empire in the 100s BC. In AD 642 Arab armies moved into the area. Many of the local Berber peoples converted to Islam. The Turkish Ottoman Empire conquered the region in the early 1500s.



The ancient Romans ruled Libya for hundreds of years. They built theaters and other structures in Libya more than 1,800 years ago.

In 1911 Italy invaded Libya. The Libyan people never accepted Italian rule. Italy lost control of Libya during World War II, which ended in 1945.

In 1951 Libya became an independent monarchy, or a state headed by a king. In 1969 a group of army officers overthrew the king. Colonel Muammar al-Qaddafi was their leader. Qaddafi became the ruler of Libya. In 1977 he changed the name of the country to the Socialist People's Libyan Arab Jamahir-*iya*. *Jamahiriya* means "brotherhood."

People found deposits of oil in Libya in the 1950s. The country sold its oil around the world. It used the profits to build housing, roads, and modern schools.

Qaddafi also used oil money to build a strong military. He kept troops in Chad (south of Libya) between 1977 and 1987. He also supported the Arab countries that considered Israel to be their enemy.

Qaddafi was accused of supporting many terrorist attacks. For years he protected two Libyan men who were suspected of planting a bomb on a U.S.-owned passenger plane. The bomb killed 270 people over Lockerbie, Scotland, in 1988. The men finally went on trial in 1999. One was found guilty. In 2003 the United Nations lifted a ban it had placed on trade with Libya.

► **More to explore**
Arabs • Sahara • Tripoli

Facts About LIBYA



Population
(2008 estimate)
5,871,000

Area
679,362 sq mi
(1,759,540 sq km)

Capital
Tripoli

Form of government
Socialist state

Major cities
Tripoli, Benghazi, Misratah, Surt

Lichen



Orange lichen covers a boulder in a mountainous area.

Lichens are made up of two tiny living things: a fungus and an alga. The fungus and the alga benefit from living together. The alga produces food, and the fungus gathers water. In this way a lichen can survive harsh weather that would kill a fungus or an alga growing

alone. This type of relationship is called symbiosis.

Lichens grow in most parts of the world. There are about 15,000 different species, or types. Lichens can live where few plants can survive. They are found in deserts, near mountain peaks, and in the frozen Arctic. They grow on stones, tree trunks, dead wood, and on the ground.

Most lichens are barely 0.25 inch (6 millimeters) high, but some can spread out to cover several feet. Many lichens look like flat, crusty blotches. Some look leafy. Some hang down in strands. Others have stalks and resemble miniature forests. Lichens range in color from brown to bright orange or yellow.

Some kinds of lichen are eaten by reindeer and even by humans. Other kinds are used to make dyes, medicines, and other products.

► More to explore

Algae • Fungus • Symbiosis



A type of lichen called old-man's beard grows on a tree trunk in Scotland.

Liechtenstein

The country of Liechtenstein is one of the smallest in Europe. Liechtenstein is a principality, meaning that a prince is the ruler. Vaduz is the capital.

Geography

The Rhine River separates Liechtenstein from Switzerland to the west. Austria lies to the east. Near the Rhine are lowlands. Mountains cover the eastern part of the country.

Plants and Animals

Copper beeches, maples, elms, limes, sycamores, and ashes are common trees in Liechtenstein. Animal life includes deer, foxes, badgers, and weasels.

People

Most of the people of Liechtenstein are related to an old Germanic tribe called the Alemanni. There are smaller groups of Swiss, Austrians, and Germans. The main language is German. Most of the population is Roman Catholic.



The castle of the prince of Liechtenstein overlooks the town of Vaduz.

Economy

Banking, tourism, and other services are important to Liechtenstein's economy. Industry is also very important. Factories produce electronics, ceramics, lenses, machinery, and metals.

Agriculture is a small part of the economy. Farmers raise cattle for dairy products and meat. Crops include grains, potatoes, and grapes.

History

The Alemanni tribe came into the region in about AD 500. In 1719 the Holy Roman Empire combined two small states into the principality of Liechtenstein. The country became independent in 1866. Today the prince of Liechtenstein plays an active role in the government.

► More to explore

Holy Roman Empire • Vaduz



Facts About LIECHTENSTEIN



Population
(2008 estimate)
35,500

Area
62 sq mi (160 sq km)

Capital
Vaduz

Form of government
Constitutional monarchy

Major cities
Schaan, Vaduz

Light

People and other animals can see because there is light. Light is a form of energy. The sun is a very important source of light energy. Without the energy from the sun, there would be no plants or animals on Earth's surface.

Sources of Light

Besides the sun, other sources provide light. Burning objects give off light. So do some animals, such as fireflies and certain fish. Lightning and electric light-bulbs also produce light.

Properties of Light

Light exists in two very different forms at the same time. One form is tiny particles called photons. The other form is waves. The easiest way to think about light is as waves. Light waves travel through space at a speed of about 186,282 miles per second (299,792 kilometers per second).

Scientists use an idea called wavelength to describe light waves. Like waves moving across a pool of water, light waves

have peaks and valleys. The distance between two of these peaks is called a wavelength. Sunlight contains light waves with long, medium, and short wavelengths.

The color of light depends on its wavelength. Red light has the longest wavelength. Violet light has the shortest wavelength. Orange, yellow, green, blue, and indigo have wavelengths in between those of red and violet. When light waves of all the colors travel together, the light looks white.

Certain objects, such as triangular pieces of glass called prisms, can separate white light into the individual colors. When light travels through a prism, waves of different wavelengths bend by different amounts. The color of each wavelength then appears separately. This effect is called a spectrum. A rainbow is a type of spectrum. When raindrops make a rainbow, they are acting like prisms.

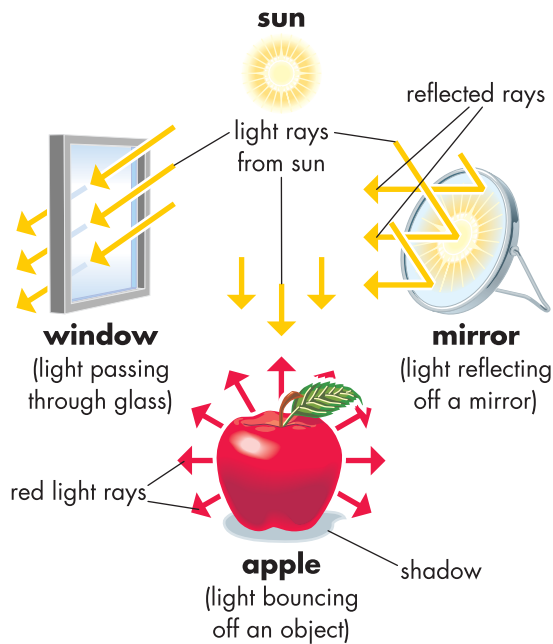
Light and Sight

People see an object either because it gives off light or because the object reflects, or bounces back, light. For example, people see the sun because it gives off its own light. But people see the moon only because it reflects light from the sun.

Most objects absorb some light and reflect some light. The reflected light is the color of the object. If an object does not reflect much light, the light passes through it. This type of object is called transparent, or see-through. By contrast,



Some small sea creatures called tunicates give off light naturally.



Most objects reflect, or bounce back, colored light. Mirrors reflect nearly all the light that hits them. Windows are see-through because they do not reflect much light.

mirrors reflect almost all the light that hits them.

Light and Life

Light is very important to life on Earth. Using the energy of sunlight, plants combine a gas in the air called carbon dioxide with water in the soil. Through this process, called photosynthesis, plants make their own food. People and other animals then use plants for food. As plants make food, they also give off a gas called oxygen. People and other animals need oxygen to stay alive. Sunlight helps animals to grow, too. It causes the body to make vitamin D, which the body needs to make bone.

► More to explore

Color • Energy • Mirror
• Photosynthesis • Prism • Rainbow
• Sun

Lighthouse

Ships rely on lighthouses to warn them of danger and to guide them to land or a harbor. A traditional lighthouse is a tall, rounded tower on land near a coast. Modern lighthouses may be on land or they may be a platform in the sea. The main feature of all lighthouses is a bright light.

Lighthouses used to be operated by a lighthouse keeper who lived in the building. Many modern lighthouses have automatic lights that are operated by remote control.

Types of Signals

The earliest lighthouses used burning fires as a source of light. Later versions used lanterns holding groups of large candles, or lamps that burned oil or gas. Today the standard source of light is an electric lamp. A special lens focuses the light into a beam that can be seen far away. The lamp and the lens turn so the beam shines in all directions.



The Thomas Point Lighthouse sits in Chesapeake Bay, south of Annapolis, Maryland. It was built in the 1800s.

In bad weather, light cannot always be seen. Lighthouses then must use other methods to signal ships. One method is sound. Lighthouses once used cannons or bells to warn ships. Today the most common sound device is the foghorn. Modern lighthouses also send out radio and radar signals to passing ships.

Lightships and Buoys

Lightships and buoys are movable devices. They are used in places where lighthouses cannot be built. Modern lightships are small ships equipped with lights, a foghorn, and radio devices. Buoys are smaller floating objects. They provide light to navigators as well as other information through their color and shape.

History

The first true lighthouse may have been one that was built in about 280 BC in Egypt. The Phoenicians, Greeks, and Romans also built lighthouses during ancient times. As shipping increased in Europe around AD 1100, construction of lighthouses also increased.

In 1759 an English engineer named John Smeaton designed a new type of lighthouse. It became a model for most lighthouses that followed. The lighthouse was built from interlocking blocks of stone instead of wood. This strengthened the structure so it could withstand powerful waves.

Lightning Bug

► see Firefly.

Lilongwe



Population
(2008 estimate)
669,020

Lilongwe is the capital of Malawi, a country in southeastern Africa. The country's president and lawmakers work in Lilongwe. Malawi's highest court meets in the city of Blantyre. Blantyre and Lilongwe are the two largest cities in Malawi.

The two centers of Lilongwe are called Old Town and Capital Hill. A nature sanctuary separates the two areas.

Farmers from surrounding areas sell their crops in Lilongwe. Malawi's main crop is tobacco. Large amounts of tobacco are traded in Lilongwe. Many people in the city work in government offices, schools, or hotels.

Great Britain took over what is now Malawi in the late 1800s. The British founded Lilongwe in 1902 as a government post. Malawi became an independent country in 1964. Lilongwe became the capital in 1975. It was chosen to be the new capital because it lies in the center of Malawi.

► **More to explore**
Malawi

Did You Know?

The U.S. state of Maine is famous for its lighthouses. More than 60 lighthouses stand on its rocky shores.

Lily

Lilies are plants that are prized for their beautiful and fragrant flowers. There are about 80 to 100 species, or kinds, of true lily. They belong to a much bigger plant group called the lily family, which contains about 4,000 species. The lily family includes tulips, hyacinths, and the onion.

True lilies grow wild in Asia, Europe, and North America. They are also very popular in gardens.

Most true lily plants are about 1 to 4 feet (30 to 120 centimeters) tall. They have narrow leaves and flowers that grow alone or in clusters. The flowers can be shaped like trumpets, funnels, tubes, or bowls. They can be any of a variety of colors. The largest flowers can be 10 inches (25 centimeters) wide. One plant can produce many flowers.

Many plants that are called lilies are not true lilies. Daylilies and the lily of the valley are not true lilies, but they

belong to the lily family. Daylilies have yellow to red flowers that last for just one day. The lily of the valley has small white flowers that droop down from a stalk. Water lilies are not part of the lily family.

► More to explore

Flower • Plant • Tulip • Water Lily

Lima



Population
(2007
estimate), urban
area,
8,472,930

Lima is the capital of the South American country of Peru. It is the largest city in Peru by far. It is also Peru's center of culture, business, and manufacturing.

One of Lima's nicknames is The Octopus. This is because the greater city area spreads out very far, like the arms of an octopus. Within this area is Callao, a port on the Pacific Ocean. It is Peru's busiest port. The historic center of Lima features the Presidential Palace and a Roman Catholic cathedral.

Lima is the most important economic center in Peru. It has Peru's largest number of government and business offices, banks, and industries. Factories in Lima process oil and make electronics, medi-



Lilies come in many colors, including pink.



Miraflores is a popular and busy area of Lima, Peru.

cines, food products, plastics, clothes, and other goods.

People have lived in the Lima area for thousands of years. Some 1,500 years ago it was a center of worship for a local god named Pachacamac. The Inca took over the area in the 1400s.

The Spanish conqueror Francisco Pizarro founded Lima in 1535. Nearby Callao soon became Spain's main port in the region. For about 200 years Lima was the capital of nearly all of Spain's colonies in South America.

A powerful earthquake nearly destroyed Lima in 1746. The city was later rebuilt.

In 1821 Peru became an independent country with Lima as its capital. Lima grew greatly in the 1900s.

► More to explore

Peru

Lime

The lime is a tart, green fruit that grows on a tree. It is the smallest member of the citrus family. Other citrus fruits include lemons, oranges, and grapefruit. The lime's scientific name is *Citrus aurantifolia*.

Lime trees grow in many warm regions, including Southeast Asia, the West Indies, the region around the Mediterranean Sea, South America, and Central America. Brazil produces most of the world's limes. Mexico and the United States also grow limes.

Lime trees are short and shrublike. They have small leaves and sharp thorns. The fruits develop from white, sweet-smelling flowers. Most lime fruits are round or oval in shape. They are about 1.5 inches (4 centimeters) across. They have a thin, green skin, or rind, that lightens to almost yellow as the fruit ripens. The pulp inside is pale green and juicy.



Limes are a yellowish green color when ripe.

Limes have a sour taste because their juice contains a lot of acid. Even so, limes are a popular ingredient in many kinds of drinks, sweet desserts, and other foods. Limes are also a good source of vitamin C.

► **More to explore**

Citrus Fruit • Grapefruit • Lemon
• Orange

Limestone

Limestone is a type of rock that is made up of bits of animal shells. Over millions of years these shells collected on the ocean floor. As layers of shells and mud built up, the lower layers slowly hardened into limestone.

Limestone is found all over the world. Dover, England, is famous for its white cliffs made of chalk, a soft form of limestone. Not all limestone is soft, however. Marble is a type of hard limestone that was formed by great pressure and heat in Earth's crust.



Machines cut blocks of limestone from large holes in the ground called quarries.

Large deposits of limestone often contain caves. Water flowing underground carves out these caves. The water dissolves, or breaks down, limestone more easily than other types of rock.

Limestone is used to make cement, roads, and fertilizer. In addition, many forms of limestone are strong enough to be used as building materials. People use limestone for making floors, for covering the walls of buildings, and for making monuments. Limestone is useful for building because it does not easily wear away and it is not difficult to shape. Over time, limestone buildings and monuments turn from white to gray.

Many limestone deposits contain fossils, or imprints of ancient plants and animals. Scientists who study Earth have learned about the planet's development from the fossils found in limestone.

► **More to explore**

Chalk • Rock • Shell



Cliffs of limestone rise from a beach in Portugal.

Lincoln



Lincoln is the capital of the U.S. state of Nebraska. The University of Nebraska was founded in the city in 1869.

Farmers from the surrounding area sell their grain in Lincoln. Factories in the city make processed foods, motorcycles, rubber products, electronics, and medicines. Many people in Lincoln work for the government or in insurance, health care, or education.

The city was founded in 1856. It was named Lancaster in 1859. In 1867 Nebraska became a U.S. state with the city as its capital. The city was renamed Lincoln in honor of former U.S. president Abraham Lincoln. In the 1870s



Lincoln is home to Nebraska's state Capitol. The building was completed in 1932.

Lincoln became a center of railroad transportation.

One of Lincoln's most famous residents was the politician William Jennings Bryan. He lived in the city in the late 1800s and early 1900s. Bryan ran for U.S. president three times.

► More to explore

Nebraska

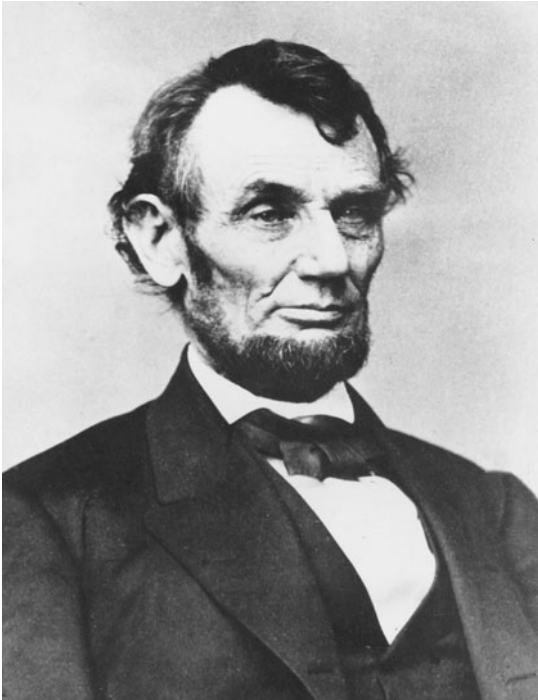
Lincoln, Abraham

Historians see Abraham Lincoln, the 16th president of the United States, as one of the country's greatest leaders. During the American Civil War Lincoln promised to save the Union. Known as the Great Emancipator, he also ended slavery in the United States.

Early Life

Abraham Lincoln was born in a log cabin near Hodgenville, Kentucky, on February 12, 1809. His parents, Thomas and Nancy Hanks Lincoln, were pioneer farmers. In 1816 the family moved to Indiana. After Abe's mother died, his father married Sarah Bush Johnston. In all, Abe went to school for less than a year.

In 1830 Lincoln moved to New Salem, Illinois. He tried several jobs and began to study law books. After becoming a lawyer in 1836, he moved to Springfield, Illinois. In 1842 Lincoln married Mary Todd. They had four sons.



Abraham Lincoln was the 16th president of the United States.

Political Career

In 1834 Lincoln was elected to the Illinois legislature. He was reelected three times. In 1847 he entered the U.S. House of Representatives. In 1849 he returned to his law practice.

The issue of slavery brought Lincoln back to politics. In 1856 Lincoln helped to organize the Illinois branch of the new Republican Party. Republicans wanted to stop the spread of slavery. In 1858 Lincoln challenged the Democrat Stephen A. Douglas for a seat in the U.S. Senate. The two candidates took part in several debates on slavery. Douglas won the election, but the debates made Lincoln famous.

Presidency and Civil War

Lincoln ran for president in 1860 and won. The Southern states feared that a Republican president would abolish slavery. They decided to secede from, or leave, the Union. South Carolina seceded in December 1860. By the time Lincoln took office in March 1861 six more Southern states had seceded. The Southern states organized a separate government, the Confederate States of America. The Civil War began in April 1861, when Confederate troops fired on



TIMELINE

Lincoln is born near Hodgenville, Kentucky.

February 12, 1809

Lincoln is elected president.

The Civil War begins.

April 12, 1861

Lincoln signs the Emancipation Proclamation.

January 1, 1863

Lincoln gives the Gettysburg Address.

November 19, 1863

The Civil War ends.

April 9, 1865

Lincoln is shot; he dies the next morning.

April 14, 1865

Fort Sumter, a Union fort in South Carolina.

Lincoln's main goal in the war was to save the Union. However, he knew he had to settle the slavery question in order for the United States to survive. In 1862 Lincoln promised freedom for slaves in any Confederate state that did not return to the Union that year. When the South paid no attention, Lincoln freed those slaves with the Emancipation Proclamation on January 1, 1863.

In November 1863 Lincoln delivered a speech—called the Gettysburg Address—at a battlefield in Gettysburg, Pennsylvania. He promised to save the United States's "government of the people, by the people, for the people."

End of the War and Assassination

In 1864 Lincoln was elected to a second term as president. On April 9, 1865, General Robert E. Lee surrendered his Confederate army to Union leader General Ulysses S. Grant. To celebrate the end of the war, Lincoln went to Ford's Theatre in Washington, D.C., on the night of April 14. During the play John Wilkes Booth, a young actor and slavery supporter, shot Lincoln in the head. Lincoln died the next morning. Vice President Andrew Johnson became president.

► More to explore

American Civil War • Confederate States of America • Emancipation Proclamation • Johnson, Andrew • Pioneer Life • Slavery • United States

Lincoln-Douglas Debates

In the 1858 election for U.S. senator from the state of Illinois, the candidates were Abraham Lincoln and Stephen A. Douglas. They met seven times to debate, or discuss, important topics. The main topic was whether slavery should be allowed in new states forming to the West.

Douglas was the Democratic Party candidate. He was running for reelection. He had sponsored the Kansas-Nebraska Act of 1854. This law made slavery possible in places where it had been banned since 1820.

Lincoln was the Republican Party candidate. At the time, few people outside



An illustration shows Abraham Lincoln and Stephen A. Douglas debating in front of a crowd in 1858.

Did You Know?

Abraham Lincoln is buried in Oak Ridge Cemetery in Springfield, Illinois.

Illinois knew anything about him. His party had been formed to stop slavery from spreading.

When Lincoln was nominated he said that slavery would be a major problem for the country because the country was so divided over the issue. In the debates Douglas tried to make Lincoln seem like a dangerous person who wanted the United States to break apart. Lincoln made the point that slavery was wrong and that it had led to much violence.

Douglas won the election, but Lincoln won many followers. Two years later the two men ran against each other again. This time it was for president of the United States. By then the Democratic Party was badly split because of the slavery issue. Also, the debates had made Lincoln a respected person throughout the North. These two things enabled Lincoln to win the presidential election by a good margin.

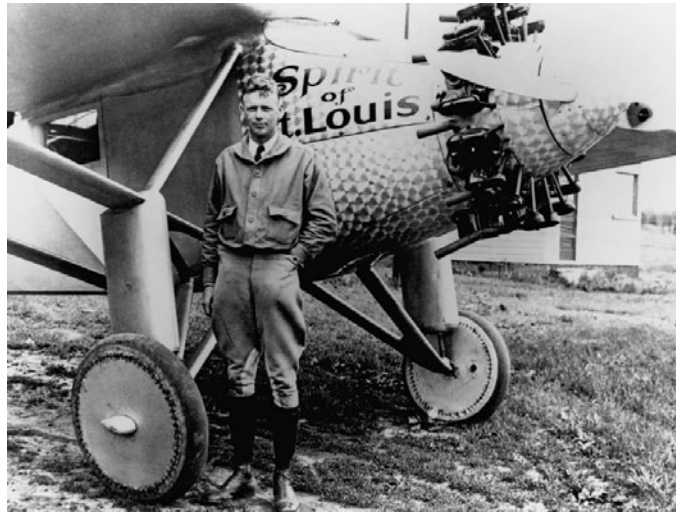
► More to explore

Kansas-Nebraska Act • Lincoln, Abraham • Slavery

Lindbergh, Charles

Charles Lindbergh was the first person to fly an airplane alone across the Atlantic Ocean without stopping. People called him Lucky Lindy.

Charles Augustus Lindbergh was born on February 4, 1902, in the U.S. city of Detroit, Michigan. He studied flying in



Charles Lindbergh stands in front of his airplane, the *Spirit of Saint Louis*, in 1927.

Nebraska and Texas. At that time airplanes were still a new invention. In 1926 he began flying mail between Saint Louis, Missouri, and Chicago, Illinois.

In 1927 Lindbergh decided to compete for a prize for flying nonstop from New York City to Paris, France. He had a plane, called the *Spirit of Saint Louis*, built for him. On May 20 and 21, 1927, Lindbergh made the flight in 33 hours and 30 minutes. He became an instant hero in the United States and Europe.

In 1929 Lindbergh married the writer Anne Morrow. Later she was his copilot and navigator on flights around the world. In 1932 their child was kidnapped and murdered. The crime received worldwide attention.

In the early 1940s Lindbergh gave speeches calling for the United States to stay out of World War II. But once the United States entered the war, Lindbergh helped the war effort. He flew 50 combat missions in the Pacific war zone.

After the war Lindbergh and his family lived quietly in Connecticut and later in Hawaii. Lindbergh died in Hawaii on August 26, 1974.

► More to explore

Airplane

Lion

The lion is the second largest member of the cat family after the tiger. Lions live in parts of Africa and India. Their loud roar is among the most terrifying sounds of the grasslands. The scientific name of the lion is *Panthera leo*.

Physical Features

The lion has a long body, short legs, sharp claws, and a large head. Adult males are about 9 to 10 feet (2.7 to 3 meters) long, including the tail. They stand about 3 feet (1 meter) tall at the shoulder and can weigh 370 to 500 pounds (170 to 230 kilograms). Females are shorter and more slender.

Lions are covered with yellow-brown hair. A male lion is easy to spot because



A lioness is very protective of her cubs.

of its mane. This coarse hair grows on its head, neck, and shoulders. Lionesses (females) do not have manes.

Behavior

Lions live in groups called prides. A pride is made up of related lionesses, their cubs, and one or two adult males. Prides average 15 members.

Lionesses usually do most of the pride's hunting, mainly at night. They hunt animals such as zebras, wildebeests, and antelopes. They often hunt by hiding beside a water hole and then pouncing. Sometimes prides hunt together as a team and share the kill.

Life Cycle

Three months after mating, lionesses bear one to six cubs. The newborns have spots or stripes that disappear within nine months. The mother guards her cubs closely. She teaches them to hunt when they are about 18 months old.

Lions in the wild rarely live more than 8 to 10 years. Lions in zoos have a life span of about 25 years.

Lions and Humans

Since the days of the Roman Empire, people have caged lions for display in circuses and zoos. People also have hunted the lion for many years. Today lions are protected in some national parks.

► More to explore

Cat • Tiger

Lisbon



Population
(2001 census),
city, 564,657;
(2005 estimate),
metropolitan
area,
2,761,000

Lisbon is the capital of Portugal, a country of southwestern Europe. The city lies on the Tagus River near where it flows into the Atlantic Ocean. Lisbon grew wealthy from sea trade in the 1400s and 1500s. It was then the center of Portugal's large and powerful empire. Today Lisbon is still Portugal's main port and largest city. It is also a center of business and industry.

Lisbon is a city of white houses and elegant parks and gardens. The city's main street, the Avenida da Liberdade (Liberty Avenue), has wide, mosaic-covered sidewalks.

Tourism, banking, insurance, and other service industries are important to Lisbon's economy. The greater Lisbon area is also a major manufacturing center. The area's traditional industries include the making of soap and steel. Today factories there also make such goods as cement, electronics, cars, foods, and paper products.

A people called the Phoenicians probably founded Lisbon as a trading station in about 1200 BC. The city was later

ruled by the Roman Empire and then Germanic peoples.

Muslims from North Africa took control of the area in the 700s. In 1147 the Christian king of Portugal conquered the city. Lisbon became the capital of Portugal in 1256.

In the 1400s and 1500s Portugal's explorers and conquerors created a huge overseas empire. Lisbon became the trade center for the Portuguese empire. Many of Lisbon's residents became rich.

One of the greatest earthquakes ever recorded struck Lisbon in 1755. It caused a huge ocean wave, called a tsunami, to wash ashore. Much of Lisbon was destroyed.



Dom Pedro IV Square, also called Rossio Square, is a center of activity in Lisbon, the capital of Portugal.

Lisbon was rebuilt quickly. The city grew larger in the 1800s and 1900s. Lisbon hosted a large fair called the World Exposition in 1998.

► **More to explore**
Portugal

Literature



Literature, both fiction and nonfiction, has the power to take readers to another place and time.

Literature is writing that is usually considered to be a work of art. It is different than written works such as cookbooks, travel guides, or how-to books. Those are meant only to provide information. In general, literature communicates ideas of lasting interest, especially ideas about what it means to be human. A writer of literature takes special care in choosing and arranging the words. Some common types of literature include novels, poetry, and dramas.

Forms of Literature

Literature can be broadly divided into two categories—poetry and prose. Poetry, or verse, is written in lines. These lines are carefully arranged according to patterns of sound, rhythm, and meaning. A poem may or may not rhyme, or

use words with similar end sounds (such as “snake” and “rake”).

Prose uses language much like everyday speech. Novels, short stories, and most modern dramas are prose.

There are two main types of prose: fiction and nonfiction. Fiction, such as novels or short stories, is mostly made up. Nonfiction discusses facts or ideas about real events and people. Histories, speeches, letters, and reviews of art are just a few examples of nonfiction. Modern literature often focuses on fiction and poetry. But many works of nonfiction have also been considered great works of literature.

Literature is also written for different audiences. Some is written specifically for children while other works are more for adults.

How Literature Developed

The Oral Tradition

Thousands of years ago people used writing mostly to keep records. They expressed ideas about the world and their history by telling stories aloud, not writing them down. Literature that is spoken out loud is called oral literature.

Each generation of people told their stories to the next generation. In this way the stories were passed along. People usually told the stories in lines of poetry. The patterns and rhymes of poems made them easier to remember. Still, people could change the stories over time or forget them. Eventually people

began writing down the stories so they could not be changed or lost.

Written Literature

Cultures all over the world have developed rich written literatures. A short history like this can point out only a few examples.

Many ancient works of literature were epics, or long poems about the adventures of heroes. For example, the *Epic of Gilgamesh* was written at least 3,500 years ago in a part of the Middle East called Mesopotamia. Other early epics include the *Mahabharata* from India and the *Iliad* and the *Odyssey* from ancient Greece. The ancient Greeks also wrote many dramas and nonfiction.

In the Middle East and Asia storytellers told the tales of the *Arabian Nights*, or



Two actors play out a scene in a production of William Shakespeare's *Romeo and Juliet* staged in London, England.

The Thousand and One Nights. These tales were collected and written down in the 800s or 900s.

In the 1000s a Japanese woman named Murasaki Shikibu wrote *The Tale of Genji*. Many consider this story of a Japanese prince to be the world's oldest novel.

One of the first works of English literature was the epic *Beowulf*, about a hero who kills a monster. It was probably created in the 700s. The English poet Geoffrey Chaucer wrote *The Canterbury Tales* in the 1300s. This long poem tells stories about a group of travelers. In the 1400s Sir Thomas Malory retold legends of King Arthur in *Le Morte Darthur* (The Death of Arthur). The English writer William Shakespeare wrote many plays in the late 1500s and early 1600s.



A copy of Geoffrey Chaucer's *Canterbury Tales* from the 1400s includes an illustration of the characters in the poem.

Did You Know?

A novel is usually a long literary work that tells a story about realistic characters and events.

They are still considered to be some of the best literature ever written.

Don Quixote is often called the first modern novel. The Spanish writer Miguel de Cervantes completed it in 1615. Over the following centuries the novel became one of the most popular types of literature.

In the 1900s writers began to experiment with the form of the novel. The Irish writer James Joyce used a technique called stream of consciousness. In this form the author tries to present the thoughts of the characters as they occur to the character. Later in the century writers from Colombia, Argentina, and other Latin American countries wrote stories that were a mixture of real and fantastic events. This style became known as magic realism.

The 1800s and 1900s also saw changes in poetry. Until that time poems had taken many forms, but often they followed strict rules about rhyme and meter. In the 1800s poets began writing in a style known as free verse. This allowed them to write poetry that more closely resembled regular spoken language.

The Spread of Literature

At first all stories had to be copied by hand. This took a long time and was expensive. Only the wealthy and well-educated had access to these copies. In the 1400s Johannes Gutenberg invented a machine called a printing press. With the printing press many copies of a book could be made very quickly and

easily. Books became easier to get. Gutenberg paved the way for the ordinary person to borrow, own, and read books. Today bookstores and libraries make all kinds of printed literature available to the public.

Literature can also be enjoyed by watching a story performed on stage. Through radio, movies, and television, stories can now be presented to millions of people at one time.

► More to explore

Drama • Fiction • Language • Poetry
• Storytelling • Writing

Literature for Children

Books written especially for children are called children's literature. Children's literature includes stories, fairy tales,



Each year the American Library Association gives the Newbery Medal to the author of the best children's book. It gives the Caldecott Medal to the illustrator of the best picture book.

fables, poems, and novels. It also includes nonfiction (factual) works on history, science, and other subjects.

Children's literature can come in the form of picture books or chapter books. Picture books usually have a smaller amount of text, or words, and pictures on every page. They are written for younger readers. Chapter books have few or no pictures and much more text, which is divided into sections called chapters. Chapter books are written for older children.

Awards

Many countries give good children's books special attention through awards and prizes. In the United States the two most important prizes for children's literature are the Newbery Medal and the Caldecott Medal. The Newbery Medal goes to the author of the best children's book of the year. The illustrator of the year's best picture book receives the Caldecott Medal. The best-known international award is the Hans Christian Andersen Award. Another important international award is the Astrid Lindgren Memorial Award.

History

Until a few hundred years ago, few books were written for children. Many children did not even learn to read at all. The first literature especially for children was published in Europe in the 1600s. Most of this early writing was not meant to entertain children. Its purpose was to teach children lessons.



An illustration from the first edition of *The Wonderful Wizard of Oz* shows the book's main characters.

1700s

Many of the books read by children during the 1700s were books written for adults. These were adventure stories with interesting characters. For example, Daniel Defoe's *Robinson Crusoe* (1719) tells the story of a man who is shipwrecked on a deserted island. Another such book was Jonathan Swift's *Gulliver's Travels* (1726). It is about the adventures of a traveler in strange lands.

John Newbery in London, England, published the first edition of the well-known Mother Goose rhymes in the 1760s. A version of Newbery's book was first published in the United States in about 1785. Since then, generations of children have learned the traditional rhymes, such as "Little Miss Muffett."

Did You Know?

The poem *Twinkle, Twinkle, Little Star* first appeared in the 1804 book *Original Poems for Infant Minds* by Ann and Jane Taylor.



Most young children enjoy being read to. Listening to other people read aloud is an important part of learning to read.

1800s

By the 1800s, children's books were becoming an important kind of literature. Authors began making their stories more interesting and imaginative. Some children's books from the 1800s are still very popular today. Many children still enjoy Lewis Carroll's *Alice's Adventures in Wonderland*, which was published in England in 1865.

Many children's books from the 1800s were collections of fairy tales and folktales. These stories of magical creatures, animals that talk, and imaginary places have always fascinated children. Two German brothers, Wilhelm and Jacob Grimm, published a collection of old German fairy tales in 1812. The collection is commonly called *Grimm's Fairy Tales*. It features stories about such characters as Snow White and Cinderella. In the late 1800s Sazanami Iwaya of Japan wrote *Japanese Fairy Tales*, a collection of old stories. In 1896 K. Langloh Parker retold the folktales of the Aborigines (the native people of Australia) in *Aus-*

tralian Legendary Tales. A collection of Latin American folktales appeared at about the same time in Brazil. It was called *Contos da Carochinha*.

1900s and Today

During the 1900s more children's books were published than ever before. Many were collections of folktales from various countries.

In Great Britain and the United States much children's literature of this time focused on fantastic worlds. *The Wonderful Wizard of Oz* (1900) by L. Frank Baum, *Winnie-the-Pooh* (1926) by A.A. Milne, and *Charlotte's Web* (1952) by E.B. White are good examples. The playful poetry, funny characters, and fanciful drawings of the many books by Dr. Seuss also fit in this category. He published *The Cat in the Hat* in 1957.

Other children's literature of the 1900s showed realistic characters facing the difficulties of growing up. Lucy Maud Montgomery's *Anne of Green Gables* (1908), Katherine Paterson's *Bridge to Terabithia* (1977), and the novels of Judy Blume are examples. J.K. Rowling's popular Harry Potter books of the late 20th and early 21st centuries have a magical setting. However, they also realistically show the emotions of young people.

► More to explore

Blume, Judy • Book and Bookmaking • Carroll, Lewis • Fable • Folktale • Grimm Brothers • Literature • Mother Goose • Poetry • Rowling, J.K. • Seuss, Dr. • Storytelling

Lithuania

Lithuania is one of three countries in northeastern Europe known as the Baltic states. Latvia and Estonia are the other two. Lithuania's capital is Vilnius.

The Baltic Sea forms Lithuania's western border. Lithuania shares land borders with Latvia, Belarus, Poland, and Russia.

Lithuania's landscape includes low-lying plains and some hills. The country has a cool climate.

Lithuania has forests of pine, oak, birch, and spruce trees. Its wildlife includes wolves, foxes, otters, badgers, wild boars, elk, deer, beavers, and mink.

Most of the country's people are Lithuanians. The population also includes Russians, Poles, Belarusians, Ukrainians, and other groups. Most Lithuanians are Roman Catholics. More than half of the people live in cities.



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Trakai Castle stands on an island in a lake west of Vilnius, Lithuania.

Services and manufacturing are the main parts of Lithuania's economy. Services include education, health care, and communications. Factories make tools, motors, electronics, petroleum (oil) products, cloth, chemicals, and ships.

In 1386 Lithuania's leader, called a grand duke, married the queen of Poland. The union of Lithuania and Poland lasted until the late 1700s. Russia then took over most of Lithuania.

Lithuania declared its independence in 1918. However, the Soviet Union took over in 1940. Nazi Germany seized control of Lithuania in 1941, during World War II. The Soviets drove out the Germans in 1944.

Lithuania gained independence when the Soviet Union collapsed in 1991.

► **More to explore**
Baltic Sea • Vilnius



Facts About LITHUANIA



Population
(2008 estimate)
3,358,000

Area
25,212 sq mi
(65,300 sq km)

Capital
Vilnius

Form of government
Republic

Major cities
Vilnius, Kaunas,
Klaipėda,
Siauliai,
Panevėžys

Little Rock

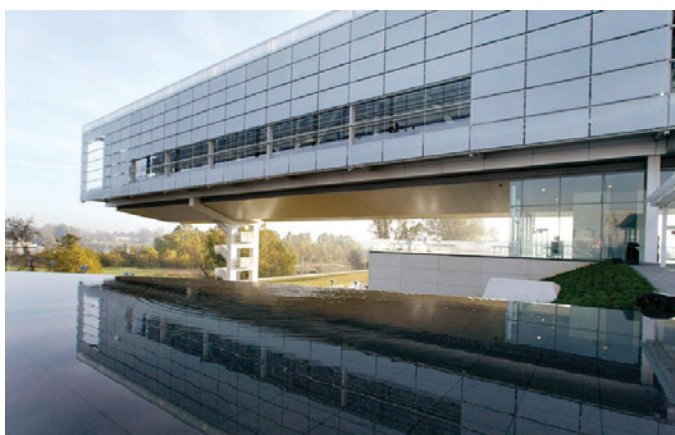


Population
(2000 census)
183,133;
(2007 estimate)
187,452

Little Rock is the capital of the U.S. state of Arkansas. It lies on the Arkansas River.

Many people in Little Rock work for the state government. The city is a center of manufacturing. In addition, farmers in the region around Little Rock sell their crops in the city.

Little Rock began in 1722 when a French explorer set up a trading post. The post was at the site of a Quapaw Indian settlement. Little Rock soon grew up there. It became the capital of the Arkansas Territory in 1821. In 1836 Arkansas became a U.S. state with Little Rock as its capital.



The William J. Clinton Presidential Library is in Little Rock, Arkansas.

A major event in the civil rights movement happened in Little Rock in 1957. Since 1954 U.S. public schools were no longer allowed to have separate schools for people of different races. Nine African Americans tried to attend a school in Little Rock that had only white students. For several days Arkansas state troops would not let them enter the school. Eventually, U.S. troops made sure the African Americans could attend the school.

► More to explore

Arkansas • Civil Rights Movement

Liver

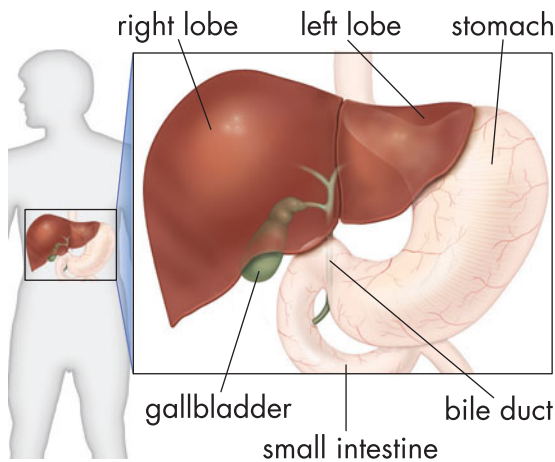
The liver is a spongy organ, or body part, in all vertebrates, or animals with a backbone. The liver does many important jobs. It cleans the blood. It also creates and stores substances that the body needs.

Structure

In humans the liver is the body's largest and heaviest organ. It lies mostly under the bottom five ribs on the right side of the body. It is made up of two rounded parts, or lobes. The right lobe is much larger than the left lobe.

Jobs of the Liver

Blood brings many substances to the liver for processing. The liver takes poisons and other harmful substances from the blood. It then breaks them down into safer forms. It breaks down worn-out red blood cells, too.



The liver is a large organ, or body part, located next to the stomach.

The liver also takes useful substances from the blood and stores them. These substances include sugars, vitamins, minerals such as iron, and amino acids. (Amino acids are the building blocks of proteins, which make up the body's cells.) The liver releases these stored materials when the body needs them.

In addition, the liver makes substances needed by the body. The liver makes proteins that help to clot blood. It makes certain enzymes, which break down food into fuel for the body. It also makes a yellow-green fluid called bile. Bile flows through ducts, or tubes, from the liver into a sac called the gallbladder. From the gallbladder, bile flows into the small intestine. There it helps to digest fats.

Liver Problems

Several different viruses and drugs can cause a liver disease called hepatitis. Drinking too much alcohol can scar the liver. This condition is called cirrhosis. These and other problems with the liver can cause jaundice, which is a yellowing of the skin and eyeballs. The yellow

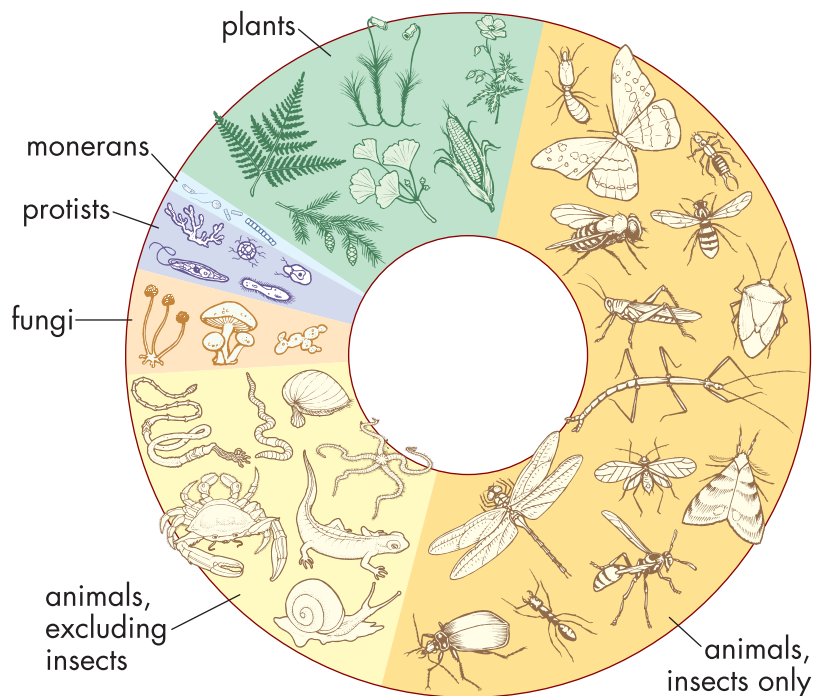
color comes from a buildup of bile substances in the blood. Doctors can sometimes transplant a new liver into a patient whose liver has failed.

► More to explore

Blood • Digestive System • Hepatitis

Living Thing

Animals, plants, fungi, algae, protozoans, and bacteria are living things. Living things are also called organisms. Scientists can tell living things and nonliving things apart because living things behave in ways that nonliving things do not. Scientists have discovered about 1.5 million different kinds of living things on Earth.



Scientists think that there are more than 14 million different species, or kinds, of living things on Earth. However, only about 1.5 million have been discovered. Most of these species are animals.

What Living Things Do

The most obvious clue to whether something is living is its ability to move. All living things can move, using their own energy. Even though plants stay in one spot, they move their leaves to get sunlight.

Living things are also sensitive. This means that they are able to feel. The simplest life forms can feel only when something touches them, or they have only a sense of hot and cold.

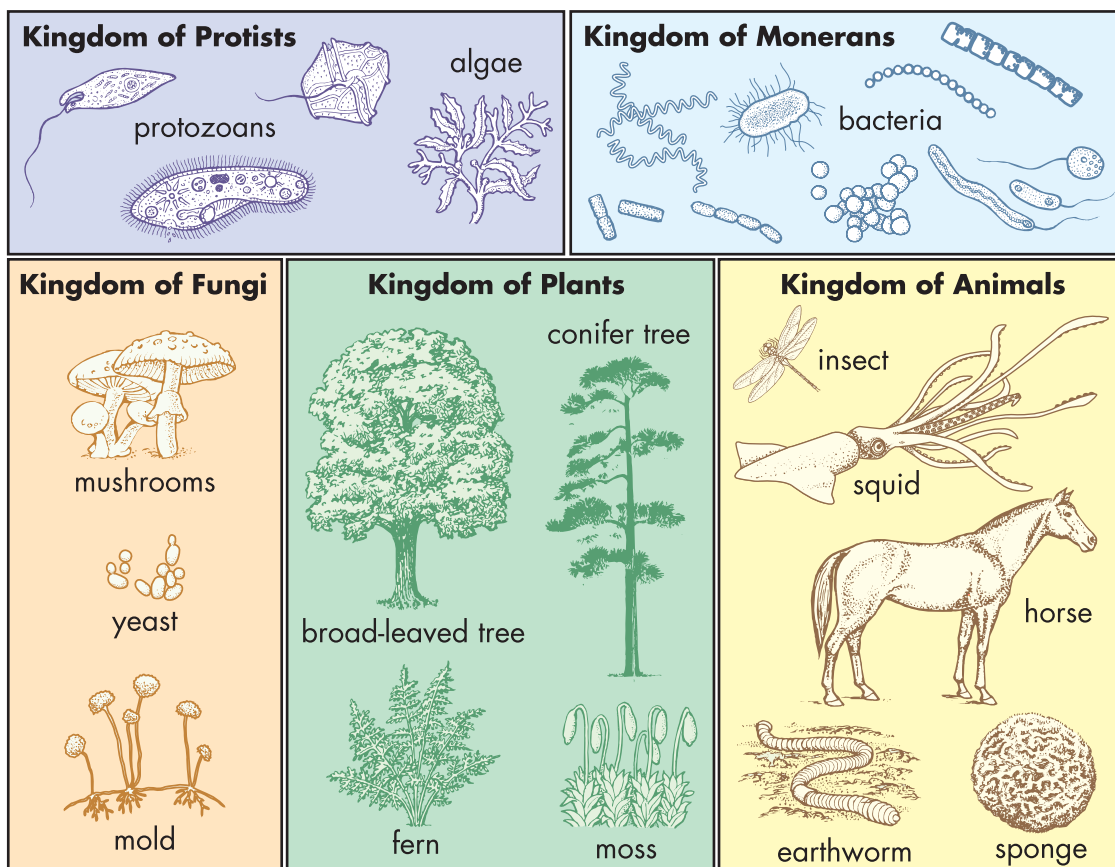
Living things take in certain chemicals and release other chemicals. Humans and other animals breathe in oxygen and breathe out carbon dioxide. Green plants

take in carbon dioxide through their leaves and release oxygen into the air.

All living things need the nutrients and energy that food gives. Green plants make their own food with the help of sunlight. Animals eat plants and other animals to get energy.

Living things reproduce. This means that they create a new generation of life. People and animals have babies. Plants make seeds or spores that grow into new plants. Even the most basic life form, a single cell, reproduces. It does so by dividing into two new cells.

Living things grow. When many cells in a plant or an animal divide, the plant or



Scientists divide living things into five main groups: protists, monerans, fungi, plants, and animals. These groups are called kingdoms.

animal becomes larger. Living things also grow by making new parts—for example, branches or teeth.

Finally, living things get rid of waste. When an animal or plant takes in nutrients, there is always a part that is not needed. This part is excreted, or released from the system.

Groups of Living Things

Scientists divide living things into groups. This process is called classification. The most basic groups are called kingdoms. There are five kingdoms of living things.

The first kingdom is called Monera. Monerans are single-celled organisms. They are too simple to be called plants or animals. They are so small that it takes the power of a microscope to see them. Bacteria, or germs, are monerans.

The second kingdom is called Protista. Most of these organisms are also single cells. Algae and protozoans are in this kingdom.

The third kingdom is Fungi. Most fungi have many cells arranged in threadlike groups. Mushrooms are fungi, and so are yeasts and molds.

The fourth kingdom is Plantae. Plants are also made of many cells. Most plants are green or have parts that are green.

The fifth and largest kingdom is Animalia. Like fungi and plants, animals have many cells. Unlike other living things,

animals move around easily and quickly react to their surroundings.

► More to explore

Algae • Animal • Bacteria • Fungus
• Plant • Protozoan

Lizard

Lizards belong to the group of animals called reptiles. Reptiles have scales on their body instead of hair or feathers. There are more than 3,000 species, or types, of lizard. Iguanas, chameleons, geckos, and skinks are some of the types.

Where Lizards Live

Lizards are cold-blooded animals. This means that the temperature of the body changes based on the temperature of the surroundings. Therefore most lizards do not live in very cold places. Many species are found in wet tropics or dry deserts. Lizards live underground, on the ground, and in trees or plants. A few species spend some time in water.



The Komodo dragon is the largest lizard.



The Australian frilled lizard spreads out the skin around its neck to scare enemies.

Physical Features

Lizards vary more in size and shape than any other group of reptiles. Some lizards are only an inch or two long. But the largest lizard, the Komodo dragon, can reach a length of 10 feet (3 meters). Most lizards have four strong legs, but some have no legs at all. These lizards look like snakes and are often mistaken for them. Unlike snakes, however, lizards have eyelids and ear openings. Lizards usually have a long tail, too.

Most lizards have dry scales covering their body. The scales are small plates that are either smooth or bumpy. They are often brown, green, or gray.

Many lizards have unique features. Some have horns or spines. Others have a bony plate around the neck. These features help the lizards scare away enemies. A few species have extra skin on the sides of the body. Spreading this skin helps them to glide from tree to tree.

Two kinds of lizard are poisonous. They are the Gila monster of the southwestern

United States and the beaded lizard of Mexico. Their venom, or poison, is strong enough to kill a human.

Behavior

Most lizards are active during the day. Geckos, however, are usually active from dusk to dawn. Different types of lizard have different ways of moving around. Most run on four legs, but some run fastest on their back legs. Legless lizards move like snakes do.

Many lizards are able to change from their drab color to a brighter color. They do this when trying to attract a mate or to scare away another animal. Some also change color as a way to communicate with each other. Temperature and light also affect lizards' color changes.

Lizards spend much of their time looking for food. Most lizards eat insects, but some eat seeds and plants. Lizards may dig for food. They also may wait for prey to come near. Then they dart suddenly to catch it.



The Gila monster has a strong bite. Its jaw delivers venom, or poison, into its victim.

Most lizards run away from their enemies. But sometimes an enemy cannot be avoided. In these cases some lizards puff themselves up with air and stand straight. This makes the lizard look bigger and tougher.

Many lizards use their tails to escape from enemies. The tail breaks off when touched and then twists and wiggles on the ground. The wiggling tail distracts the enemy while the lizard escapes. A lizard usually can grow a new tail.

Reproduction

Most lizards reproduce by laying eggs. The females of most species lay several eggs at a time, but some kinds lay only one or two. The eggs have tough, leathery shells. Lizards usually bury their eggs or hide them under leaves. In a few species the females watch their eggs until they hatch. Most lizards, however, leave the eggs after laying them. A few types of lizard give birth to live young instead of laying eggs.

Lizards and Humans

In some parts of the world people eat large lizards, such as iguanas. Many small lizards are useful to people because they eat insect pests.

Human activities have threatened the survival of some lizard species. By cutting down trees to make room for buildings, people have destroyed the homes of some lizards. Capturing and selling lizards as pets also has reduced their numbers. The great Komodo dragon of

Indonesia, for example, was almost wiped out. It is now protected by law.

► More to explore

Chameleon • Gecko • Iguana • Reptile
• Snake

Ljubljana



Population
(2008 estimate)
267,760

Ljubljana is the capital of Slovenia, a country in southeastern Europe. High mountains surround the city. It is Slovenia's largest city and center of culture.

Much of the country's business and industry is based in Ljubljana. Factories there make such products as metals, electronics, chemicals, and paper. Many



The Ljubljanica River flows through Ljubljana, Slovenia.

people in the city work in government offices, tourism, or other service industries.

More than 2,000 years ago a city called Emona was built on the site that is now Ljubljana. It became part of the Roman Empire. Invaders destroyed Emona in the 400s. In the 500s a Slavic people began settling a new town there. It later came to be called Ljubljana.

From the 1200s to the early 1900s Slovenia was part of the empire of Austria-Hungary. For much of the 1900s Slovenia was part of a country called Yugoslavia. Slovenia became an independent country in 1991. Ljubljana became its capital.

► More to explore

Slovenia • Yugoslavia

Llama

The llama is a mammal that belongs to the camel family. Unlike camels, llamas do not have humps. But like most camels, llamas are domesticated, or tamed to help people. Other close relatives of the llama are the alpaca, the guanaco, and the vicuña. The llama's scientific name is *Lama glama*.

Most llamas are found in South America. American Indians in Bolivia, Peru, Ecuador, Chile, and Argentina raise herds of the animals.

The llama has a long neck and a small head. It has a short tail and long legs that end in hooves. It is about 4 feet



Llamas are usually gentle animals, but when they get mad they may spit.

(1.2 meters) tall at the shoulder. Its hairy coat may be white, black, brown, or a mixture of these colors.

The llama eats many types of grass and other plants. It is a hardy animal that can survive for a long time without water. For these reasons, people often use llamas to carry loads in the Andes Mountains. People also use llama hair to make clothing, rugs, and rope.

► More to explore

Camel • Mammal

Lobster

► see Crustacean.

Locust

Locusts are a type of grasshopper. They are found worldwide. They sometimes gather and fly together in huge groups called swarms.

Did You Know?

A 250-pound (113-kilogram) llama can carry a load of 100 to 130 pounds (45 to 60 kilograms).



Swarms, or large groups, of locusts can fly for thousands of miles.

Locusts are about 2 inches (5 centimeters) long. They have short antennae. Their strong, long hind legs make them good jumpers. Locusts make noise by rubbing their hind legs on their wings.

Locusts usually live a rather quiet life alone. But sometimes they reproduce so quickly that they become crowded together. This crowding causes some locusts to act differently. These locusts might form a swarm. They can fly for days or weeks over thousands of miles. When they finally stop, each locust can

eat more than its body weight in food. This can destroy farm fields very quickly.

Cicadas are often called locusts, but they are a different family of insects. The best-known type is called the 17-year cicada. It lives underground for 17 years before coming out. After a few weeks of activity, it dies.

► More to explore

Grasshopper

Loire River

The longest river in France is the Loire. It is 634 miles (1,020 kilometers) long. The Loire Valley is a popular tourist area known for its châteaux (French for “castles”). The scenic valley is sometimes called the Garden of France.

The Loire River begins about 4,500 feet (1,370 meters) above sea level in the Cévennes mountain range of southern France. It is fed by melting snow from



The Loire River flows past a château, or castle, in France.



mountain peaks. The Loire flows north through central France before swinging in a great curve past the city of Orléans and turning westward. It empties into the Atlantic Ocean near the city of Nantes.

The Loire Valley is a main agricultural region of France. Vegetables and fruit, especially grapes used in making wine, grow well there. The valley's higher ground produces rye and wheat. Dairy farming and livestock grazing are common in the area near Orléans.

► More to explore

France

Lomé



Population
(2005
estimate), city,
921,000; urban
area,
1,337,000

Lomé is the capital of Togo, a small country in western Africa. The city is

located on the Gulf of Guinea, which is part of the Atlantic Ocean. Lomé is Togo's largest city. It is also the country's center of education, business, and transportation.

Shipping is important to Lomé's economy. The city is Togo's main port. Ships load up there with products for sale to other countries. Some of the main products shipped are cocoa, coffee, cotton, and minerals. Lomé also has an oil refinery.

Lomé began as a small village called Alomé. Local people settled the village in the 1700s. In 1884 Germany took



Togo's legislature, the National Assembly, meets in a large building in Lomé.

over the area. The Germans renamed the village Lomé. They made Lomé the capital of their colony of Togoland in 1897. In the early 1900s the area came under the rule of France. In 1960 French Togoland became the independent country of Togo, with Lomé as its capital.

► More to explore

Togo

London



Population
(2006
estimate),
7,512,000

London is the capital of the United Kingdom, a country in western Europe. It is also the capital of England, which is part of the United Kingdom. London lies on the Thames River. It is the largest city in the country. It has long been a major center of culture, business, and banking.

Places of Interest

London is an ancient city, and it has many historical sites. Since 1066 England's kings and queens have been crowned in a church called Westminster Abbey. The queen of England lives in Buckingham Palace. The Parliament meets in the Palace of Westminster. Its famous clock tower contains a huge bell called Big Ben.

London is known for its many museums. The British Museum is the world's oldest public museum. It is full of ancient treasures. The National Gallery has many European paintings.

Economy

London is one of the world's most important centers for banking, investing money, and insurance. The tourist industry is also important to the city's economy. In addition, many people in London work in government offices, schools, museums, and stores.

History

Romans founded the city in the 1st century AD. They called it Londinium (the name was eventually shortened to London). It was part of the Roman Empire for about 400 years. Later a Germanic people called the Saxons settled in London. William the Conqueror (William I), from Normandy in France, took control of England in 1066. He had a fortress built in the city. It was later called the Tower of London.



A double-decker bus drives past the clock tower at the Palace of Westminster. This tower contains a huge bell known as Big Ben. The tower is a famous sight in London.



A huge Ferris wheel called the London Eye sits along the Thames River in London, England.

London grew rapidly. Several times, however, a disease called the plague killed many people there. In 1666 a fire destroyed the city, but it was rebuilt.

Over the years the English built a huge empire, and London grew wealthy as the capital of the empire. The city was the center of the world's economy from the late 1700s to the early 1900s.

In 1940–41, during World War II, Germany repeatedly bombed London. The city was heavily damaged. After the war, London was rebuilt. In the early 21st century terrorists bombed London's public transportation system. However, the city continued to thrive.

► More to explore

England • Thames River • United Kingdom

Loon

Loons are large waterbirds known for their unusual wailing calls. They are excellent swimmers and divers. In fact, these birds are called divers in Great Britain. Their feet are webbed, and their legs are set far back on their bodies. These features help loons swim but make the birds almost unable to walk.

There are several species, or types, of loon. Loons live near freshwater lakes and ponds in northern regions. They are found in the northern parts of North America, Europe, and Asia. Loons migrate, meaning that they fly to warmer areas for the winter.

Loons are about 2–3 feet (60–90 centimeters) long. They have stout bodies and pointed bills. Their wings are small and pointed. Their feathers are mainly black, brown, or gray on the upper body and white below.

Except for penguins, no birds are better divers than loons. Loons sometimes



The common loon is also known as the great northern diver.

dive 200 feet (60 meters) below the surface of the water. They can stay underwater for three minutes or more. Loons put these skills to good use in catching fish and other small water animals to eat.

Loons make a wide variety of calls. They use some calls to frighten away invaders and others to locate or greet mates. Many people think the calls sound like eerie laughing, yodeling, wailing, or hooting.

► More to explore

Bird • Migration, Animal

Loris

Lorises are slow-moving mammals with enormous eyes. They are primates, as are lemurs, tarsiers, monkeys, apes, and human beings. Lorises live mainly in the tropical rain forests and bamboo groves of India and Southeast Asia.

Lorises measure about 7 to 15 inches (18 to 38 centimeters) long. They have round faces, small ears, and dark patches around their large eyes. Their thick fur is gray or brown. Lorises have a short, stubby tail or no tail at all. They have short, thick fingers and toes that are capable of an extremely powerful grip. The second toe on each foot has a long claw for grooming.

The animals live in trees and rarely venture to the ground. They are slow and careful climbers and do not leap from tree to tree. They spend their days rolled



The strong hands and feet of a loris help it to climb trees. Its large, round eyes help it to see in the dark.

up in a tight ball, fast asleep. When night arrives, they begin searching for food.

Lorises feed on insects, fruit, and plant shoots. They also eat small birds and their eggs and even small mammals and lizards. When a loris spots a possible meal, it often launches a surprise attack. It firmly grips a branch with both feet and stands straight up. Then, still holding on, it throws its body forward and grabs the prey with both hands.

Gestation, or pregnancy, lasts about six months. The female usually gives birth to a single offspring. Lorises may live as long as 14 years.

► More to explore

Primate • Rain Forest • Tarsier

Los Angeles



Population
(2000 census),
city, 3,694,820;
(2007 estimate)
3,834,340

Los Angeles is the second largest city in the United States, after New York City. It lies on the Pacific Ocean in the southern part of the state of California. The Los Angeles area is very spread out. It includes both beaches and mountains. The city is famous for its movie industry, celebrities, and sunshine, as well as for its pollution and traffic jams.

Places of Interest

Hollywood, the center of the U.S. motion picture industry, is a district in Los Angeles. Many movies and television shows are filmed in Hollywood studios. Universal Studios also includes a movie-related theme park. The Kodak Theatre hosts the yearly Academy award



Classical music concerts are held at the Walt Disney Concert Hall in Los Angeles, California.

presentations. Celebrities are also honored with displays at the Walk of Fame and Mann's Chinese Theatre.

Los Angeles surrounds the city of Beverly Hills. It is known for its movie-star residents and expensive stores.

Concerts, plays, and dance performances are held at the Los Angeles Music Center. It includes the Walt Disney Concert Hall, home of the city's orchestra. The Getty Museum displays a large art collection. Los Angeles also has a number of professional sports teams.

Economy

The entertainment industry and tourism are important to Los Angeles' economy. Trade, health care, and other services also bring money to the city. Los Angeles is a major manufacturing center. Factories in the area process oil and make airplanes, spacecraft, toys, clothing, and electronics.

History

Los Angeles grew around a Spanish religious settlement called a mission. Settlers founded the town in 1781. It was ruled by Spain and later Mexico. In 1846, during the Mexican War, U.S. forces captured Los Angeles.

Los Angeles grew very rapidly. Its population went from about 11,000 in 1880 to more than 1 million in 1930. The growth of the movie business and other industries attracted more people to the city. In the early 21st century Los Ange-

les was still one of the fastest-growing cities in the United States.

► More to explore

California • Movie

Louis XVI



The painting shows Louis XVI in formal dress.

Louis XVI was the last king of France before the French Revolution. During the revolution he lost his kingdom and then his life.

Early Life

Louis was born on August 23, 1754, in Versailles, France. In 1765 his father died. When Louis was only 15 years old, he married Marie-Antoinette of Austria. Louis's grandfather King Louis XV died on May 10, 1774. Louis then became king.

Reign

Louis was a weak king. He hired people who tried to make the government fairer

and more modern. However, the French nobles stopped these efforts.

Louis also sent ships and troops to support the American Revolution. He did this because he wanted to make trouble for Great Britain. This effort was a success, but it cost more than the kingdom could afford to pay.

By 1789 the French people were very angry about France's money problems and Louis's weakness. They also disliked Marie-Antoinette. The king needed help, so he called together the Estates-General. This was a group of representatives made up of nobles, church leaders, and common people. But the representatives could not work together to solve France's problems.

In July 1789 the common people began the French Revolution. Louis remained king, but he grew afraid. In 1791 he tried to slip out of France and into Austria. The French people caught him and took him back to his palace.

Last Days

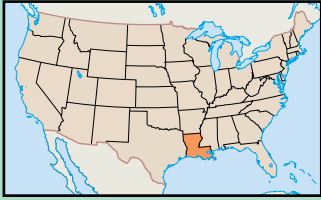
Revolutionary troops took Louis prisoner in August 1792. In September France became a republic—a nation ruled by the people instead of a king. The people tried Louis for treason (betraying his country), and he was found guilty. On January 21, 1793, in Paris, France, the French people put King Louis XVI to death.

► More to explore

French Revolution • Marie-Antoinette

Did You Know?

The younger brother of Louis XVI became king of France in 1814. He was known as Louis XVIII.



Louisiana

The U.S. state of Louisiana has a rich cultural history. Originally a Spanish and French colony, Louisiana existed as a settled area for a century before it became part of the United States. The French explorer Sieur de La Salle chose the name Louisiana in honor of King Louis XIV of France. The capital is Baton Rouge.

Geography

Louisiana is located in the southern part of the United States. It is bordered by the state of Mississippi, the Mississippi River, and the Pearl River to the east; by Arkansas to the north; by Texas and the Sabine River to the west; and by the Gulf of Mexico to the south.

Louisiana is one of the flattest states in the nation, and much of the area around the Gulf coast is below sea level. The

state has thousands of miles of swamp-land around the mouth of the Mississippi River. Waterways known as bayous pass through this area. Louisiana has a humid climate that is hot in the summer and mild in the winter. Hurricanes coming out of the Gulf have often battered the coastal areas.

People

About two thirds of Louisiana's people are whites of European heritage and about one third are African American. Descendants of the early French and Spanish colonists are called Creoles. Many of them are of mixed ancestry.

During the mid-1700s a group of French-speaking people moved to Louisiana from Canada. Their descendants are known as Cajuns. They often live in their own communities and speak their own language, a combination of French and other languages.

Economy

Louisiana is among the nation's leading producers of oil, natural gas, and salt. The state's main industries include chemical manufacturing and oil refining. Paper goods, fabricated metals, transportation equipment, and processed foodstuffs such as sugar are other chief industrial products.

Sugarcane (for sugar) is the state's main agricultural crop. Other major farm products include cotton and cattle. The fishing industry in Louisiana provides





Oak trees line an avenue leading to one of Louisiana's old plantation homes.

shrimps, oysters, and other seafood. Service-based industries, such as tourism, commercial sales, government, health care, and finance, play vital roles in the state's economy. One of the main tourist destinations is the city of New Orleans. In 2005 the city was badly damaged by flooding caused by Hurricane Katrina, but it soon began to rebuild.

History

There were several Native American tribes in the region when Europeans began settling in the Louisiana area. The Caddo were the largest group, but the Tunica, the Choctaw, and others also lived in the area.

The Spanish were the earliest Europeans to explore the area. But the French were the first to settle it, beginning in about 1702. In 1803 the United States bought the region from the French as part of the

Louisiana Purchase. Louisiana became a U.S. state in 1812.

In the 1800s there were many large Louisiana farms called plantations. Plantations depended on slave labor. Louisiana therefore joined other slave-owning states in the Confederacy during the American Civil War (1861–65). Louisiana rejoined the Union in 1868. Through most of the 1900s, the state had to deal with issues of discrimination against African Americans.

Louisiana faced another great challenge in 2005. In that year Hurricane Katrina broke down the barriers that protected the city of New Orleans from flooding. Hundreds of thousands of people lost their homes in the disaster. Many had to leave the state.

► More to explore

Baton Rouge • Caddo • Louisiana Purchase

Facts About LOUISIANA

Flag



Population

(2000 census)
4,468,976—
rank, 22nd state;
(2008 estimate)
4,410,796—
rank, 25th state

Capital

Baton Rouge

Area

51,840 sq mi
(134,264 sq
km)—rank, 31st
state

Statehood

April 30, 1812

Motto

Union, Justice,
and Confidence

State bird

Brown pelican



State flower

Magnolia



Louisiana Purchase

In 1803 the area of the United States was much smaller than it is today. In that year, however, the country bought the Louisiana Territory from France. The territory stretched from the Mississippi River to the Rocky Mountains, and from the Gulf of Mexico to Canada. The Louisiana Purchase doubled the size of the United States.

Historical Background

A French explorer named Sieur de La Salle had claimed Louisiana for France in 1682. He named the territory after the French king Louis XIV. It originally included land on both sides of the Mississippi River.

In 1762 France gave the part of Louisiana west of the Mississippi to Spain. The rest they gave to Great

Britain. It became part of the United States after the American Revolution. In the late 1700s settlers from the eastern part of the United States started moving into the area. Spain allowed them to use the Mississippi River and the port city of New Orleans, near the river's mouth.

In 1801 the powerful French leader Napoleon got the territory back. This worried the U.S. settlers. They were afraid that France might try to interfere with traffic on the river.

The Purchase

President Thomas Jefferson first tried to buy just New Orleans. Napoleon ignored him until Jefferson threatened to join forces with Great Britain, France's worst enemy. Napoleon also needed money to pay for the many wars he was fighting. For these reasons, he offered to sell the entire Louisiana Territory. The price was about 15 million



dollars. This amounted to only 3 cents per acre.

The Louisiana Purchase added 828,000 square miles (2,144,520 square kilometers) to the United States. The country eventually carved 13 states, either in whole or in part, from the territory. These states were Arkansas, Colorado, Iowa, Kansas, Louisiana, Minnesota, Missouri, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, and Wyoming.

► More to explore

Jefferson, Thomas • Napoleon

Luanda



Population
(2005
estimate), urban
area,
2,766,000

Luanda is the capital of Angola, a country in southwestern Africa. The city lies on the coast of the Atlantic Ocean. It is by far Angola's largest city.

Luanda is a busy seaport. Ships load up there with coffee, oil, and other products for sale to other countries. The city also has some factories, including a factory for processing oil.

The Portuguese founded Luanda in 1576. In 1627 it became the capital of



An Angolan woman carries a plate of fruit to sell in the streets of Luanda.

Portugal's colony of Angola. From the start Luanda was a base for slave traders. Newly captured slaves were sent from Luanda's port across the ocean to Brazil. The slave trade ended in the middle of the 1800s.

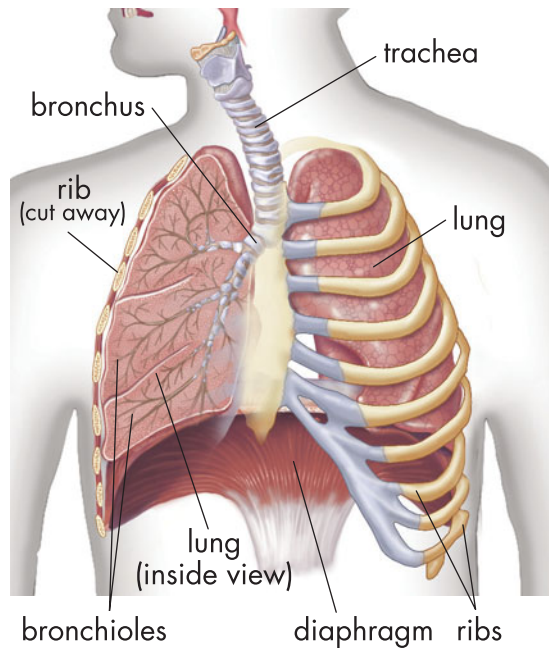
In 1975 Angola became an independent country with Luanda as its capital. Different Angolan groups immediately began fighting for control of the country. The war lasted until 2002. Luanda and the rest of the country suffered during the long civil war.

► More to explore

Angola

Lung

Lungs are baglike organs, or body parts, used for breathing. They are part of the body's respiratory system. All animals



Ribs protect both lungs. The diagram shows the inside of one lung, with the ribs cut away.

that have a backbone and breathe air have lungs. When an animal inhales (breathes in), air filled with oxygen flows into the lungs. When an animal exhales (breathes out), a gas called carbon dioxide and water vapor flow out of the lungs.

Structure

A body has two lungs, one on each side of the chest. The heart is located between the lungs. The right lung has three rounded sections called lobes. The left lung has two lobes. The base of each lung rests on a strong sheet of muscle called the diaphragm. In normal breathing the diaphragm and the muscles between the ribs automatically tighten and relax. This movement helps the lungs to fill with air and to empty.

Air enters and leaves the lungs through a series of tubes. A large, tough tube called

the trachea, or windpipe, connects the top of the throat to two branching tubes called bronchi. Each of these tubes leads to a different lung. The bronchi then divide into a web of smaller tubes called bronchioles. The bronchioles lead to tiny sacs called alveoli.

Jobs of the Lungs

When an animal breathes in, the oxygen in the air passes through the walls of the alveoli into tiny blood vessels called capillaries. Red blood cells then pick up the oxygen and take it to cells throughout the body. The blood also carries wastes, including carbon dioxide and water vapor, back into the lungs. The lungs send the wastes out of the body when the animal breathes out.

The lungs also trap and get rid of harmful substances from the air. A sticky liquid called mucus lines the lungs and the tubes leading to the lungs. The mucus traps harmful substances such as pollution and bacteria. Mucus and harmful substances leave the lungs when an animal coughs.

Lung Diseases

Most problems with the lungs can cause coughing, chest pain, and trouble with breathing. Pneumonia and tuberculosis are serious infections of the lungs. Emphysema and lung cancer are deadly diseases of the lungs. Smoking is one of the main causes of emphysema and lung cancer.

► More to explore

Air • Blood • Cough • Respiratory System

Did You Know?

The lungs of an average person contain more than 600 million alveoli.

Lusaka



Population
(2005
estimate), urban
area,
1,260,000

Lusaka is the capital of Zambia, a country in southern Africa. It is the largest city in Zambia. It is also the center of the country's economy.

Many people in Lusaka work for the government or businesses that provide services. Farmers from surrounding areas sell their crops and livestock in the city. Factories in Lusaka make cement and processed foods and drinks.

People have lived in the Lusaka area for thousands of years. In the 1890s a British company took control of the area. Lusaka was founded in 1905 as a station on a railway line. Great Britain made the area into a colony in 1924. Lusaka became the capital of the colony in 1935.

Lusaka was the center of a political movement seeking to end British rule in the area. In 1964 Zambia became an independent country with Lusaka as its capital. Since then the city has grown rapidly.

► More to explore

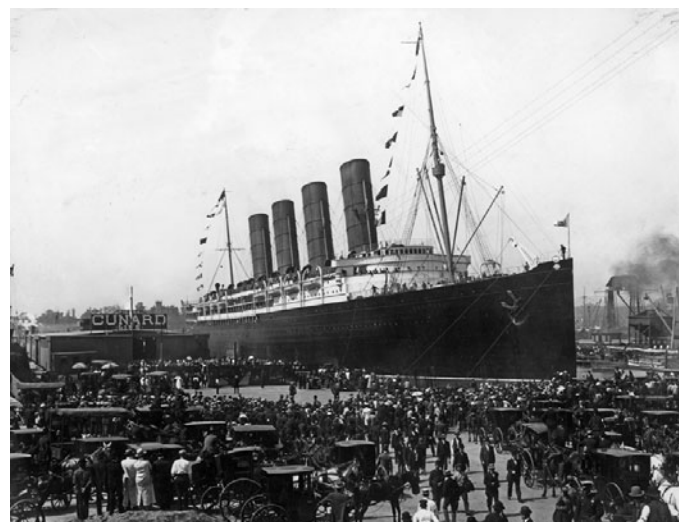
Zambia

Lusitania

The *Lusitania* was a famous British steamship of the early 1900s. A German submarine sank the *Lusitania* in the Atlantic Ocean during World War I. Almost 1,200 people died, including 128 U.S. citizens. Partly because of this attack, the United States entered World War I in 1917.

Germany and Great Britain were enemies in World War I. The Germans warned that they would try to sink the *Lusitania*. They said that the ship carried weapons as well as passengers. British officials told the captain of the *Lusitania* that German submarines had sunk other ships along the *Lusitania*'s route. The captain ignored the warnings.

On May 7, 1915, the *Lusitania* was near the coast of Ireland when it was attacked. A German submarine fired a torpedo that struck the ship. The *Lusitania* sank within 20 minutes. Only about 750 people survived.



The *Lusitania* docks at a crowded port.

The attack angered many people in the United States. They wanted their country to declare war on Germany. But for two years the United States stayed out of the war. The United States finally entered the war in 1917. It said that German submarine attacks were one of the reasons for its decision.

► **More to explore**

Submarine • World War I

Luther, Martin

The German priest and scholar Martin Luther began the Reformation in 1517. This movement at first sought to change, or reform, the Roman Catholic church. Instead it led to the establishment of Protestantism, one of the major branches of Christianity. The Protestant church known as Lutheran grew out of Luther's teachings.



A picture from the 1800s shows Martin Luther.

Early Life

Luther was born in Eisleben, Saxony (now in Germany), on November 10, 1483. In 1507 he became a Roman Catholic priest.

Meanwhile, Luther began having doubts about some practices of Roman Catholicism. For example, the church accepted money in order for sins to be forgiven. This practice was known as the selling of indulgences. Luther came to believe that God forgives sins only because of one's faith. He also thought the church was too powerful.

Efforts at Reform

In 1517 Luther wrote a list of 95 theses, or statements of his beliefs, about religion. Luther continued to write and teach on the subject of reforming the church, and his views began to gather support.

Luther's actions angered powerful church leaders. The pope (the leader of Catholicism) excommunicated, or barred, him from the church in 1521. Later that year the government declared Luther an outlaw, and he fled to a castle near Eisenach. While in hiding, he translated the New Testament into German so that more people could read it.

Luther spent the rest of his life writing, preaching, and organizing the reformed church in Saxony. He died on February 18, 1546, in Eisleben.

► **More to explore**

Protestantism • Reformation • Roman Catholicism

Luxembourg



Vianden Castle in Luxembourg was completed in the 1300s.

Luxembourg is one of the world's smallest countries. Its capital is Luxembourg city.

Geography

Luxembourg is surrounded by Belgium, Germany, and France. The land includes rolling hills and deep river valleys. The northern third of the country is part of the Ardennes Mountains. The rest of the country has a more varied landscape. A large beech forest called the Müllerthal



lies in the east-central part of the country.

People

More than half of the country's people are Luxembourgers. They speak Luxembourgian, a mixture of German and French. Most people also speak the German and French languages. Most of the people are Roman Catholics.

Economy

Banking, tourism, and other services are the most important parts of the economy. Luxembourg also produces iron and steel, machinery, chemicals, tires, and other goods. Agriculture is a small part of the economy. Crops include barley, wheat, oats, potatoes, and grapes for wine. Cattle and pigs are the main livestock.

History

The Franks, the Holy Roman Empire, and other powers controlled the region for centuries. Luxembourg became a separate state in AD 963. In 1354 the region became a duchy, or a state ruled by a duke. A series of foreign powers controlled the duchy beginning in the 1400s.

Luxembourg gained full independence in 1867. Today its ruler is still called a grand duke, but a prime minister actually runs the government.

► More to explore

European Union • Luxembourg (city)



Facts About LUXEMBOURG



Population
(2008 estimate)
488,000

Area
999 sq mi (2,586 sq km)

Capital
Luxembourg

Form of government
Constitutional monarchy

Major cities
Luxembourg, Esch-sur-Alzette, Dudelange, Schifflange, Bettembourg

Luxembourg



The city of Luxembourg is the capital of a small country that is also named Luxembourg. The city lies on the Alzette River, in northwestern Europe.

Luxembourg city is a major banking center. It is also the international headquarters for several agencies of the European Union (EU). These include the European Investment Bank and the European Court of Justice.

Many hundreds of years ago the Romans built a fort on the site of Luxembourg. In the 900s the founder of Luxembourg's royal family bought the site and built a castle there. The city of Luxembourg grew around the castle.

For several centuries the city was repeatedly attacked and rebuilt. Its castle became one of the strongest fortresses in Europe. The country fell under French, Austrian, and then German rule.

In 1867 Luxembourg became an independent country. The city of Luxembourg was its capital.

► **More to explore**
Luxembourg (country)

Lyme Disease

Lyme disease is an illness caused by tiny living things called bacteria. Small insects called ticks carry the bacteria and spread the disease.

Ticks sometimes bite humans to feed on their blood. If a tick carries the bacteria that cause Lyme disease, it can pass the bacteria to a person through its bite. The person may then become sick with Lyme disease.

One of the first signs of Lyme disease is often a circular red rash. The rash usually appears in the area of the tick bite. The person may then experience headaches, muscle aches, joint pain, fatigue, and fever.

People who have had Lyme disease for a long time may become sicker. They may have numbness in their feet and hands. They also may be confused and unable to concentrate.



Lyme disease often starts with a red rash in the shape of a circle.

Did You Know?

The name Luxembourg comes from an old Roman castle in Luxembourg city called Lucilinburhuc, meaning "little fortress."

Lyme disease can be treated with antibiotics. Antibiotics are a kind of medicine that kills bacteria. If a person with Lyme disease is not treated early on, it may become more difficult to cure the disease.

The best way to prevent Lyme disease is to stay away from places with ticks. Ticks often live in shady, wooded areas. People also can use an insect spray to keep ticks away. If ticks do land on the skin, people should remove them immediately.

► More to explore

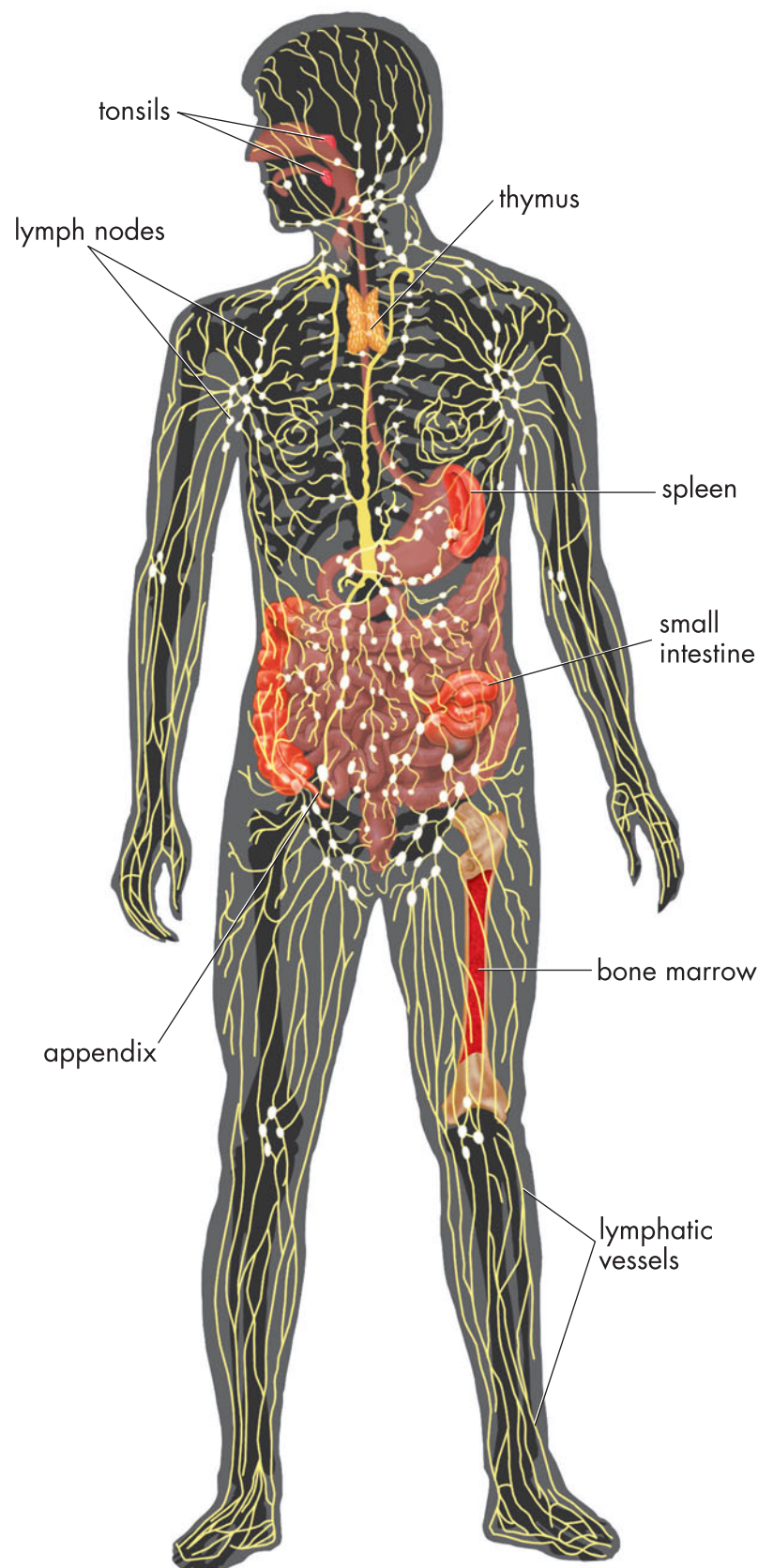
Bacteria • Disease, Human • Tick and Mite

Lymphatic System

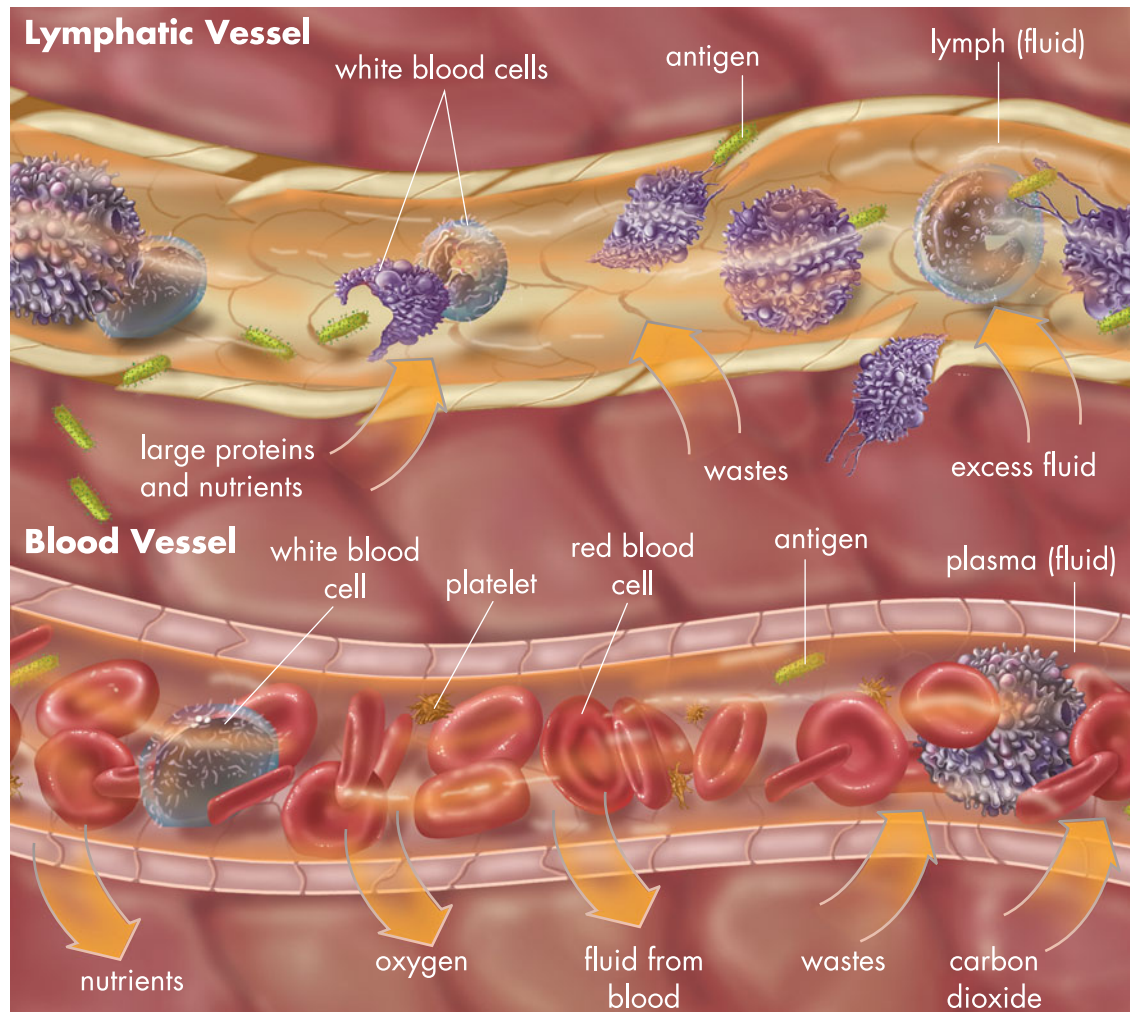
Humans and many other animals have a lymphatic system, which helps the body to fight disease. In this way the lymphatic system is a part of the immune system. The lymphatic system also carries fluid throughout the body. In this way it is a part of the circulatory system. Major parts of the lymphatic system include the lymphatic vessels, the lymph nodes, and cells called lymphocytes. The spleen, the tonsils, the appendix, bone marrow, and the thymus also belong to the lymphatic system.

Lymphatic Vessels

Lymphatic vessels run throughout the body. These vessels collect extra fluid from the body's tissues. This fluid is called lymph. Lymph carries wastes and



The lymphatic system fights disease and carries fluid throughout the body.



Lymph vessels and blood vessels both carry white blood cells. But lymph vessels carry lymph, not blood. They also carry nutrients that would not fit inside small blood vessels.

certain nutrients, especially proteins. Lymph flows from the lymphatic vessels into the blood at a vein near the heart.

Lymphatic vessels also collect foreign substances, called antigens, from the tissues. Antigens include such things as bacteria and viruses, which can cause disease.

Lymph Nodes and Other Organs

Lymph nodes, or lymph glands, are small, bean-shaped organs. The human body has thousands of lymph nodes.

They are found at certain points along the lymphatic vessels. They are clustered in such places as the neck, the armpits, the knees, and the groin. Lymph nodes remove antigens from the lymph. Lymph nodes also hold antigen-fighting cells called lymphocytes.

Other organs of the lymphatic system also contain lymphocytes. The spleen sits behind the stomach. It filters antigens from the blood. The tonsils trap antigens in the throat. The appendix and other areas in the intestines trap antigens, too.

Lymphocytes

Lymphocytes are white blood cells. They begin in bone marrow, which is a soft tissue inside the bones. Some lymphocytes, called B cells, develop in the bone marrow. Other lymphocytes, called T cells, travel to the thymus to develop further. The thymus is a pyramid-shaped organ that lies beneath the breastbone.

Lymphocytes travel through the lymph and the blood. They collect in the lymph nodes and other lymphatic organs. They work to destroy antigens that could harm the body.

► More to explore

Blood • Circulatory System • Immune System

Lynx

Lynx are wild cats that live in the forests of Europe, Asia, and northern North America. They are known for their sharp vision.

Lynx are about 30 to 40 inches (80 to 100 centimeters) long, without the short tail. They weigh 20 to 45 pounds (9 to 20 kilograms). Lynx have long legs and large, furry paws that help them move through snow. Their thick fur helps to keep them warm in cold weather. The fur is yellowish brown to gray, with darker brown and black patches. It is bushy on the neck. The ears and tail have black hair at the tip.

Lynx live alone or in small groups. They hunt at night. Lynx eat birds and small animals. Some lynx, such as the Eurasian



Lynx have large paws that help the animals move through snow.

lynx, will eat larger prey such as deer. Canadian lynx eat mostly snowshoe hares. Lynx like to sneak up on their prey rather than chase it down.

Lynx are good swimmers and climbers. They also can make great leaps. Lynx are generally silent, except during the mating season.

Lynx are closely related to the bobcat and the caracal. The bobcat is also called the bay lynx. It is common to many parts of the United States and has yellowish brown fur tinged with red. Its fur also has black spots. The caracal is sometimes called the Persian, or desert, lynx. It is found in hills, deserts, and plains of Africa, the Middle East, and Asia. It has a reddish brown coat.

► More to explore

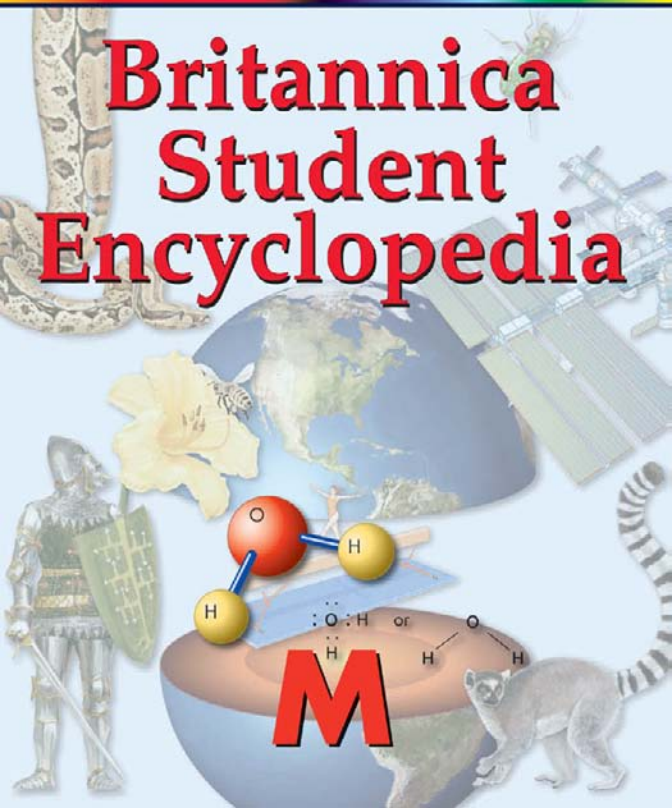
Cat

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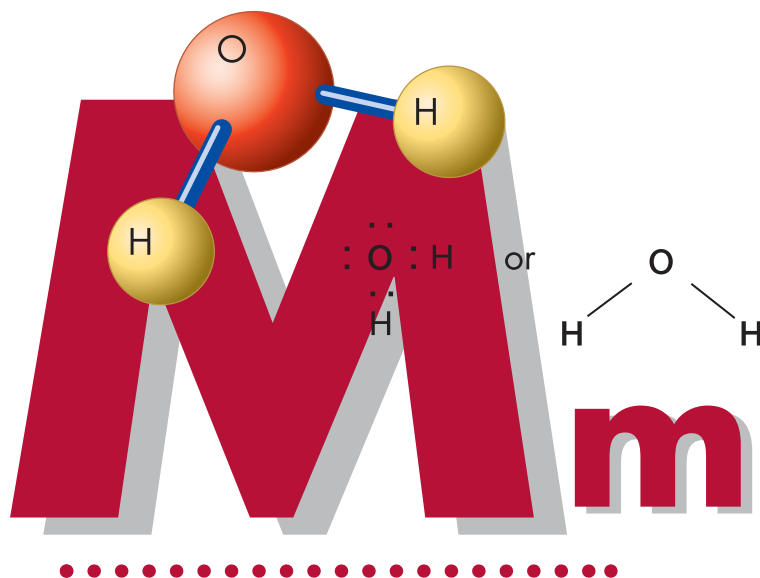
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Madagascar is known as the Great Red Island because it has rich, red soil.

(See Madagascar.)

The Portuguese explorer Ferdinand Magellan and his crew were the first Europeans to sail across the Pacific Ocean.

(See Magellan, Ferdinand.)

Nelson Mandela spent almost 30 years in prison before becoming South Africa's first black president.

(See Mandela, Nelson.)

Everything touched by Midas, a figure from ancient Greek and Roman mythology, turned to gold.

(See Midas.)

A molecule is the smallest unit of a substance that has all the properties of that substance.

(See Molecule.)

Macau

Macau is a special administrative region of China. Macau is part of China, but it controls many of its own affairs.

Part of Macau is a small piece of land connected to China's southern coast. The capital city, also called Macau, covers most of that land. The region of Macau also includes two nearby islands in the South China Sea.

Most of the people who live in Macau are Chinese. There are also some Portuguese. Most Chinese in Macau practice Buddhism. The Portuguese are mainly Roman Catholic.

Trade is very important to Macau's economy. Macau is a free port. That means that ships from anywhere in the world may use the port without paying special taxes. Tourism and gambling also bring a lot of money to Macau.

People have lived in what is now Macau for at least 4,000 years. The rulers of China controlled the area over the centuries. Portuguese ships started arriving in Macau in 1513. Portugal used Macau as a base for trading with China and Japan. The Portuguese put a governor in charge of Macau, but the Chinese held most of the power.

In 1974 Portugal gave Macau more control over its own affairs. Macau was officially returned to Chinese rule in 1999.

► More to explore

Buddhism • China

Macdonald, John

John Macdonald was the first prime minister of Canada. He was born on January 11, 1815, in Glasgow, Scotland. His family moved to what is now Ontario in 1820. Alexander attended school there and became a lawyer in 1836.

At that time the land that is now Canada consisted of various territories ruled by Great Britain. In 1841 the British Parliament combined Canada West (now Ontario) and Canada East (now Quebec) to create the Province of Canada. Macdonald was elected to the assembly of the Province of Canada in 1844.

Great Britain ruled several other territories as well. Macdonald worked to bring them all together into one country. In 1867 the British North America Act created the Dominion of Canada. It included the Province of Canada, Nova Scotia, and New Brunswick. Macdonald became its first leader, or prime minister.

Under Macdonald's leadership, the dominion soon expanded to include the provinces of Manitoba (1870), British Columbia (1871), and Prince Edward Island (1873). In 1873 Macdonald was forced to resign because the government was accused of taking bribes. However, he returned as prime minister five years later and served until his death on June 6, 1891, in Ottawa, Ontario.

► More to explore

Canada

Macedonia

Macedonia is a small country in south-eastern Europe. It is part of a region called the Balkans. Its capital is Skopje.

Macedonia borders Serbia, Kosovo, Bulgaria, Greece, and Albania. The Vardar River flows through the center of the country. Many mountains cover the land.

Forests cover the mountains of Macedonia. Wolves, bears, lynx, wild pigs, lizards, and other animals live in the country.

Most of the people are ethnic Macedonians. They speak a language called Macedonian. Other ethnic groups include Albanians, Turks, Roma (Gypsies), and Serbs. More than half of the people are Eastern Orthodox Christians. Nearly one third are Muslims.

Many Macedonians work in services, including communications, government



The Monastery of Saint Naum in southern Macedonia was built in the 900s.

work, and health care. Industry and agriculture are also important to the economy. Factories make cloth, metals, construction materials, and other goods. Mines provide lead and coal. Farmers grow wheat, potatoes, wine grapes, tomatoes, and tobacco.

People lived in the region of Macedonia as early as 7000 BC. By the 300s BC King Philip II ruled an empire that included nearly all of Greece. His son Alexander the Great expanded the empire. Later other groups conquered Macedonia. By the 1300s most of Macedonia belonged to the Turkish Ottoman Empire.

The Kingdom of Serbs, Croats, and Slovenes took over Macedonia in 1918. The kingdom was renamed Yugoslavia in 1929. Macedonia gained independence in 1991.

► More to explore

Alexander the Great • Balkan Peninsula
• Skopje

Facts About MACEDONIA



Population
(2008 estimate)
2,039,000

Area
9,928 sq mi
(25,713 sq km)

Capital
Skopje

Form of government
Republic

Major cities
Skopje, Bitola,
Prilep,
Kumanovo,
Tetovo

Machine

A machine is a device that does a physical task. Some machines make moving or lifting things easier. Other machines carry people from place to place. Yet

other machines help in building or making things.

Simple Machines

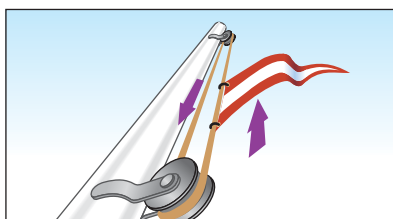
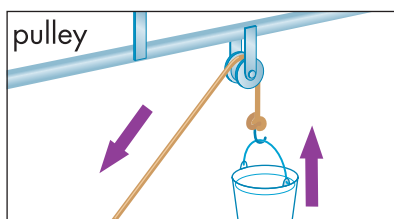
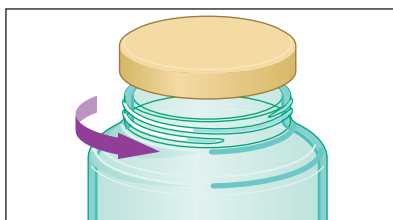
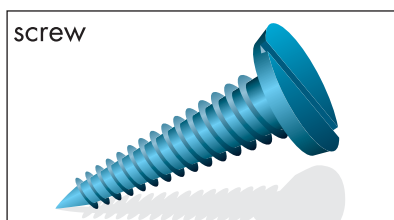
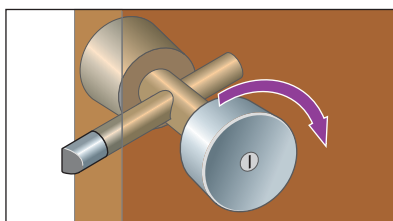
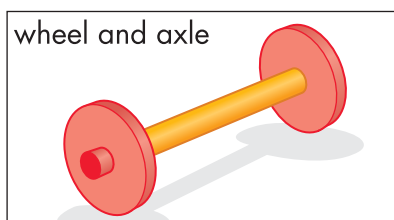
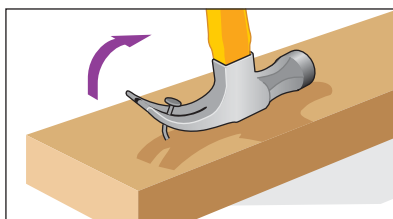
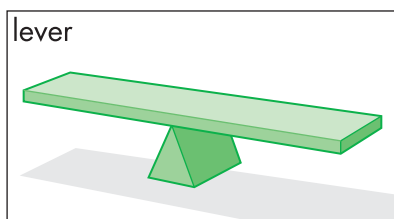
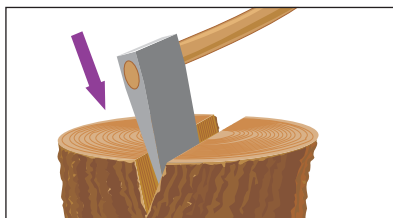
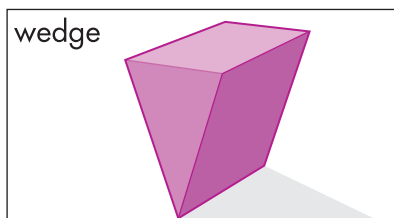
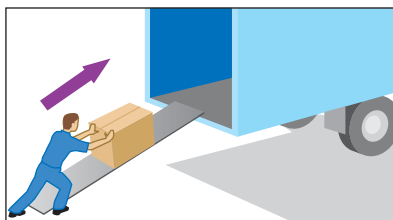
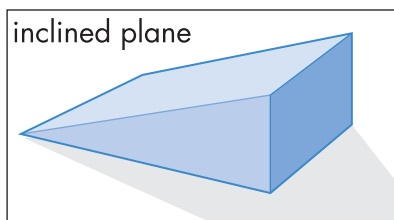
The most basic machines are called simple machines. They are the inclined plane, the wedge, the lever, the wheel and axle, the screw, and the pulley. Simple machines change the strength or direction of a force, such as a push or pull.

An inclined plane is a flat surface that is raised at one end. It takes less force to move an object up along an inclined plane than it does to lift it straight up. Ramps and sloping roads are examples of inclined planes.

A wedge is a piece of material that narrows to a thin edge. Pushing the wedge in one direction creates a force in a sideways direction. The head of an ax is a wedge. Swinging the ax into a log can split the log apart.

A lever is a bar or board that rests on a support called a fulcrum. A lever can transfer and increase the force applied to one end of it. People use levers to move heavy objects or to pry things loose. A hammer acts as a lever when used to pry a nail from a board. The part of the hammer that rests on the board is the fulcrum.

An axle is a shaft, or rod, that is fixed to the center of a wheel. In some wheel-and-axle machines the wheel is replaced with a crank or another part that turns in a circle like a wheel. A steering wheel in a car is a wheel-and-axle machine.



The six simple machines are used in a variety of everyday objects.

Another example is a doorknob. A doorknob is a wheel that turns an inner shaft (axle) that moves the latch.

A screw is a thin rod with edges, or threads, that curve around it. Turning a screw produces a force that can push the screw into wood or tighten it against a nut. Similar threads are used on jars and other containers so that lids close tightly.

A pulley is a wheel with a rope or something similar around its edge. The pulley changes the direction of the force applied to one end of the rope. For example, by pulling down on one end of the rope, a person can lift an object attached to the other end.

Compound Machines

Simple machines can be combined to create compound machines. Compound machines can be as small as a mechanical watch or as large as a construction crane.



A crane is a machine that makes lifting heavy objects easier.

In a compound machine, forces and motion are transferred from one part to another. One way this is done is with gears. A gear is typically a circular piece of metal with teeth, or ridges, along its outer edge. The teeth of one gear fit into those of another. When one gear turns, it also turns the other gear. Another way of transferring forces and motion is with a type of pulley that uses a chain or a band of flexible material called a belt.

A bicycle is an example of a compound machine that uses a chain to transfer force. The chain runs around two separate toothed wheels, which act as pulleys. One is attached to the axle of the rear wheel. The other is attached to the pedals through an axle. The pedals work like the crank of a wheel-and-axle machine. The force used to turn the pedals becomes a stronger turning force on the axle and its toothed wheel. The chain transfers the force to the rear wheel and makes it turn. In some bicycles the chain can be shifted between



A mechanic puts together complex machinery that will power an airplane.

toothed wheels of different sizes. This changes the amount of force the rider needs to turn the rear wheel.

► More to explore

Force • Motion

Machu Picchu

In the mountains of south-central Peru stands Machu Picchu, a deserted city of the Inca people. The name Machu Picchu means “old peak” in Quechua, the language of the Inca. The dwellings at the site were probably built and occupied from the mid-1400s to the early or mid-1500s. Machu Picchu is one of the few American Indian sites dating from that long ago to be found nearly intact.

Machu Picchu is located about 50 miles (80 kilometers) northwest of the city of Cuzco, which was the capital of the Inca Empire. It lies between two sharp peaks in the eastern Andes Mountains, at a height of 7,710 feet (2,350 meters). Mountain forest surrounds the site.



Mountains and forests surround the ruins of Machu Picchu.

Machu Picchu is divided into two sections, one farming and one urban. The farming section is made up of steplike fields called terraces. The Inca used the terraces for growing crops such as corn and sweet potatoes. The urban section has plazas, temples, houses, and a cemetery. They are connected by walkways and thousands of stone steps.

Most of the structures are very well preserved because of the quality of Incan engineering and stonework. One notable structure is the Temple of the Sun. Once a year sunlight shines through a window onto the middle of a large stone. This stone was a sort of calendar. Another famous structure is a pillar known as the Intihuatana. The pillar was probably used to keep track of the seasons.

The role of Machu Picchu in Incan society is not entirely understood. Many archaeologists believe it was the estate of a powerful Inca emperor. They do not know why the site was abandoned. Lack of water may have been a reason.

Machu Picchu remained hidden from the Spanish when they conquered the Inca in the 1500s. Plants grew over the site, and for hundreds of years it was known only by a few people who lived in the area. The world learned of Machu Picchu when a local farmer led a U.S. archaeologist to the ruins in 1911. Today Machu Picchu is a popular tourist attraction.

► More to explore

Andes • Inca • Peru

Madagascar

Madagascar is an island country located off the southeastern coast of Africa. The island is the fourth largest in the world. Only Greenland, New Guinea, and Borneo are larger. Madagascar is known as the Great Red Island for its rich, red soil. Its capital is Antananarivo.

Geography

Madagascar lies in the western Indian Ocean. The Mozambique Channel separates the island from the African coast.

The central part of Madagascar is a plateau, or high, flat land. Mountains rise above the plateau in some places. Maromokotro Peak in the north is the island's highest point. It rises 9,436 feet (2,876 meters). A narrow plain runs along the east coast. Low plateaus and plains cover the west. Rivers are short and fast flowing in the east and longer in the west.

The east coast has a hot, humid tropical climate. The central plateau is cooler. The southwest is dry.

Plants and Animals

Grasses cover most of the island. Some tropical forests and mangrove swamps survive on the coasts. Hundreds of different kinds of orchid also grow in Madagascar.

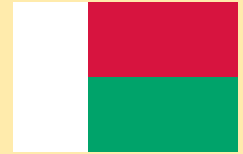
Madagascar has many types of animals that live almost nowhere else in the world. Two examples are lemurs and fossas. Lemurs are monkeylike animals

that live in trees. Fossas are catlike mammals that hunt birds and lemurs. Many butterflies, chameleons, and crocodiles also live in the country.

People

Madagascar's people are known as the Malagasy. The Malagasy are more closely related to Indonesians than to Africans, even though the country is closer to Africa than to Indonesia. The Malagasy are divided into about 20 groups. The Merina make up the largest group. The country also has small groups of people from Africa, Asia, France, and the nearby island country of Comoros.

Many people of Madagascar speak both the Malagasy and French languages. About half of the people are Christian, and most of the rest follow traditional Malagasy religions. Fewer than one third





Rice is grown on hillsides in Madagascar.

Facts About MADAGASCAR



Population
(2008 estimate)
20,215,000

Area
226,658 sq mi
(587,041 sq km)

Capital
Antananarivo

**Form of
government**
Republic

Major cities
Antananarivo,
Toamasina,
Antsirabe, Fia-
narantsoa,
Mahajanga

of the people live in cities. Almost all the major cities and towns are in the east.

Economy

Madagascar is a poor country. Most of the people live by growing crops and by raising humped cattle called zebu. Rice is the main food crop. Farmers grow vanilla and cloves to sell to other countries. Madagascar also produces coffee, sugar, and shrimp.

Madagascar's small industries make mainly cloth, clothing, cement, soap, beer, and cigarettes. Mines provide chromite, graphite, gold, and gems.

History

People first came to Madagascar from Indonesia more than 1,000 years ago. Arab traders arrived on the island before AD 1000. The first Europeans to visit

Madagascar were Portuguese sailors, who first arrived in 1500. The French set up trading posts in the 1600s.

Around this time the Malagasy began to develop kingdoms. The Malagasy traded slaves to the French in return for weapons. The Merina kingdom conquered much of the island by the early 1800s. The French defeated the Merina in 1895. France then ruled the island as a colony. The island became the independent Malagasy Republic in 1960.

In the 1970s the country's military took power. The country took the name Madagascar in 1975. In 1992 Madagascar held free elections for the first time in 17 years. The new government worked to improve the economy.

► More to explore

Antananarivo • Indian Ocean • Lemur

Madison



Population
(2000 census)
208,054;
(2007 estimate)
228,775

Madison is the capital of the U.S. state of Wisconsin. It is nicknamed the City of Four Lakes. Part of the city lies on a narrow strip of land between Lakes Monona and Mendota. Two other lakes are located nearby. The city is a center of government, culture, and education. The main campus of the University of Wisconsin is located in Madison.

Many people in Madison work for the university or the state government. Trade, manufacturing, and business services are important to the city's economy. High-technology companies and tourism also bring money to the city.

Native Americans settled in the area that is now Madison hundreds of years

ago. Madison was founded in 1836. It was named after former U.S. President James Madison. Later in 1836 Madison was chosen to be the capital of the Wisconsin Territory. Wisconsin became a U.S. state in 1848, with Madison as its capital.

► More to explore

Wisconsin

Madison, James

James Madison was the fourth president of the United States. He is known as the Father of the Constitution for his role in the Constitutional Convention of 1787. He also led the country through the War of 1812.

Early Life

James Madison was born in Port Conway, Virginia, on March 16, 1751. His parents were James Madison, Sr., and Eleanor Rose Conway. Madison lived most of his life at Montpelier, his family's plantation. He graduated from the College of New Jersey (now Princeton University) in 1771.

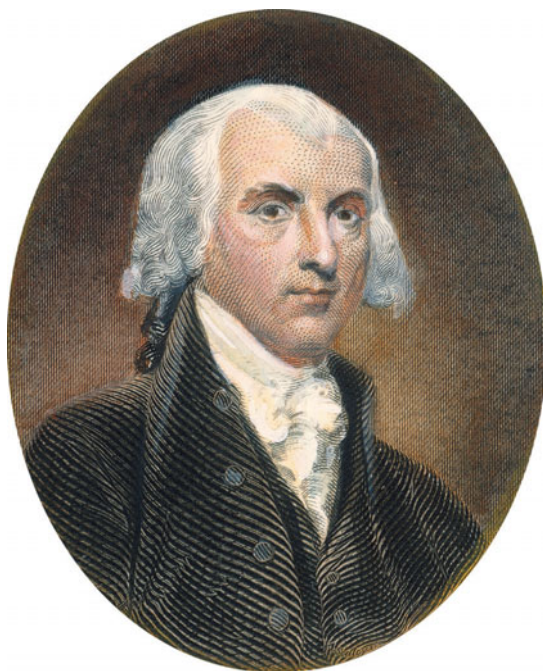
Political Career

In 1776 Madison helped to write Virginia's constitution. In 1779 he was elected to the Continental Congress, where he served until the end of the American Revolution.

In 1784 Madison entered the Virginia legislature. He then helped bring about the U.S. Constitutional Convention. In 1787 the convention met in



The Wisconsin state Capitol is in Madison.



James Madison

Philadelphia, Pennsylvania, to create a system of government for the United States. Many of Madison's ideas, including his support of a strong central government, went into the new U.S. Constitution.

In 1789 Madison was elected to the new House of Representatives. There he

helped pass the Bill of Rights, the first 10 amendments to the Constitution. During his time in Congress Madison came to believe that the federal government should not have more power than the states. He shared that opinion with his friend Thomas Jefferson.

In 1794 Madison married Dolley Payne Todd. They had no children together.

In 1801 President Jefferson made Madison secretary of state. They worked together to buy the Louisiana Territory from France in 1803.

Presidency

Madison won election as president in 1808. He was reelected in 1812. That year the United States entered the War of 1812 against Great Britain. The United States won some victories at sea but lost many land battles. In August 1814 the British invaded Washington, D.C., and burned the White House.



TIMELINE

Madison is born in Port Conway, Virginia.

March 16, 1751

Madison helps make the Louisiana Purchase.

1803

The War of 1812 begins.

1812

Madison dies in Montpelier, Virginia.

June 28, 1836

Madison attends the Constitutional Convention.

Madison is elected president.

Madison retires to his plantation.

When the war ended in 1814, there was no clear winner.

Retirement

Madison retired to Montpelier in 1817. He supported Jefferson in founding the University of Virginia. He also worked to end slavery. Madison died on June 28, 1836.

► More to explore

American Revolution • Bill of Rights
• Constitution • Continental Congress
• Jefferson, Thomas • Louisiana Purchase • United States • War of 1812

Madrid



Population
(2007 estimate), city, 3,132,463; urban area, 5,764,000

Madrid is the capital of Spain, a country of western Europe. It is Spain's largest city. It is also a major center of the arts, education, business, industry, and transportation.

Places of Interest

The heart of Madrid is a plaza called the Puerta del Sol (Door of the Sun). From this plaza spread the city's busiest streets. Madrid's older section centers around the Plaza Mayor. It is a large square built in the 1600s.



Madrid's Plaza Mayor is a popular meeting place.

Madrid has many museums. The Prado Museum is one of the most important art museums in Europe. It is best known for its paintings by the Spanish artists Diego Velázquez and Francisco de Goya.

Economy

Madrid is Spain's center for banking and insurance. Construction and service industries such as tourism and publishing also bring money to the city. Many Spanish businesses have their headquarters in Madrid. Manufacturing is also important. Factories in Madrid make such products as cars, airplanes, electronics, plastics, and rubber.

History

People have lived in the Madrid area for thousands of years. By the 900s it was a small fortress town of Muslims from northern Africa. A Spanish Christian king named Alfonso VI captured the town in 1083.

Madrid remained small and unimportant until it became the Spanish capital. In 1561 King Philip II made it the center of his royal government. In 1607 King Philip III made Madrid the official capital of Spain.

France controlled Madrid for a few years in the early 1800s. During the Spanish Civil War (1936–39) Madrid suffered heavy bombing.

Madrid grew greatly in the second half of the 1900s. It also became the target of several terrorist attacks. In 2004 almost 200 people were killed when terrorists bombed several trains in the city.

► More to explore

Spain • Spanish Civil War

Magazine

A magazine is a printed collection of writings that is published a certain number of times a year. Many magazines are published monthly or weekly. Magazines typically contain articles, pictures, and letters from readers. They often are printed on glossy, high-quality paper. Magazines are more up-to-date than books but more permanent than newspapers.

The most recently published magazines are called current issues. Magazines sold on newsstands and in stores are generally current issues. Older issues, called back issues, can be found in libraries or on the Internet.

Did You Know?

Magazines are also called periodicals.

Types of Magazines



Stone Soup is a magazine by and for children. The stories, poems, and illustrations in the magazine are created by children themselves.

There are many kinds of magazines. Magazines such as *Time* and *Newsweek* are meant for many different readers. They cover news, business, entertainment, and other subjects. Other magazines focus on one subject. For instance, *National Geographic* covers geography, and *Wired* discusses computers. Many magazines are aimed at a certain group, such as teenage girls or African Americans.

Digests are collections of articles on a number of different subjects. *Reader's Digest* is probably the most popular of this type of magazine.

Scientific or scholarly magazines are often called journals. Professors usually read and write them, and universities often publish them.

Some people make their own magazines at a low cost. These publications, called zines, are often copied on regular paper and stapled together. Beginning in the 1990s, many people put their zines on the Internet.

History

The invention of the printing press in the middle of the 1400s made magazines possible. One of the earliest magazines was published in Germany in the 1660s. A few years later specialized magazines on the arts and sciences appeared in England and France. The French magazine *Le Mercure galant*, first published in 1672, was the first magazine meant for entertainment.

Many magazines on politics and literature appeared during the 1700s. Some of the greatest writers of this period created magazines or wrote for them. During the 1800s the reading audience grew, and new magazines were created for different groups of people. For example, women's magazines and children's magazines became popular. These magazines often included illustrations.

Photographs became common in magazines during the 1900s. Magazines also came to depend heavily on advertising. The sale of advertisements allowed publishers to keep magazine prices down, which attracted more readers.

► More to explore

Advertising • Book and Bookmaking
• Newspaper • Printing

Magellan, Ferdinand

Ferdinand Magellan was an explorer from Portugal. He and his sailors were the first Europeans to cross the Pacific Ocean. One of his ships made the first trip around the world, though he did not live to complete the voyage.

Early Life

Magellan was born in Portugal in about 1480. He came from a noble family. As a young man he served in the Portuguese navy. He fought in India and the East Indies. The East Indies are the islands between mainland Southeast Asia and Australia. Magellan helped Portugal win control of trade with the Moluccas, an island group in the East Indies. Europeans called the Moluccas the Spice Islands because they produced valuable spices.



Ferdinand Magellan



Portugal did not reward Magellan well for his services. Magellan was so angry that he went to work for Spain instead. The main purpose of his great voyage was to claim the Spice Islands for Spain.

Voyages

Magellan sailed from Spain in 1519 with five ships. He sailed across the Atlantic Ocean and down the coast of South America. In 1520 he found a passage to the ocean that the Spanish explorer Vasco Núñez de Balboa had first seen in 1513. Magellan named it the Pacific Ocean. The passage, at the southern tip of South America, is now called the Strait of Magellan.

With three ships left, Magellan crossed the Pacific. After about 100 days he

reached the islands now called the Philippines. On April 27, 1521, he was killed in a fight with the people of the islands.

After Magellan's death two of his ships continued westward. One ship made it across the Indian Ocean and around the southern tip of Africa. It returned to Spain on September 8, 1522.

► More to explore

Balboa, Vasco Núñez de • Pacific Ocean

Magic

Magic is the art of performing tricks to make the impossible seem possible. Magicians amaze audiences by appearing to make objects disappear, read minds,

or float off the ground. But for thousands of years, people believed that magicians actually had special powers. They thought magicians could control other people and natural forces, such as the rain or the wind. People thought to have magical powers were also known as witches, wizards, and sorcerers.

Today most magic tricks involve “sleight of hand.” This is the ability to move objects, such as cards or coins, quickly and secretly. The secrets to many magic tricks are written down in books that anyone can read. It may take weeks or months to learn a trick, though. Many magicians, also called illusionists, carefully guard the secrets to their tricks.

One of the most famous magicians was Harry Houdini. He was known for his amazing escapes from handcuffs and straitjackets in the early 1900s. Other important magicians have included Doug Henning, David Copperfield, Penn and Teller, and David Blaine.

Magna Carta



A picture from the 1800s shows King John of England signing the Magna Carta.

The Magna Carta (Latin for “Great Charter”) was a document that gave certain rights to the English people. King John of England agreed to it on June 15, 1215. The Magna Carta stated that the king must follow the law. He could not simply rule as he wished. It was one of the first documents to state that citizens had such rights.

England’s nobles (called barons), church leaders, and the common people disliked King John. He demanded too much money from his people. The barons drew up the Magna Carta to limit his power. John was too weak to resist them.

The Magna Carta dealt mostly with the rights of barons and the Roman Catholic church. However, it also guaranteed the rights of women and children who inherited property. It stated that a per-

Did You Know?

A copy of the Magna Carta dating from 1215 is on display in the British Library in London, England.



Two children entertain their family members with a magic show.

son could not be punished for a crime unless they were lawfully convicted. Finally, the Magna Carta gave barons the right to declare war on the king if he did not follow the document.

The Magna Carta was a first step in the creation of England's constitution. Many other countries later used the ideas of the Magna Carta in their constitutions, too.

► **More to explore**
Constitution

Magnet and Magnetism

A magnet is a rock or a piece of metal that can pull certain types of metal toward itself. The force of magnets, called magnetism, is a basic force of nature, like electricity and gravity. Magnetism works over a distance. This means that a magnet does not have to be touching an object to pull it.

What Causes Magnetism

People have known for a long time that a certain type of rock, called lodestone, is a natural magnet. When scientists learned why that is, they also learned how to make other metals into magnets.

Magnetism happens when tiny particles called electrons behave in a certain way. All objects in the universe are made up of units called atoms. Atoms in turn are made up of electrons and other particles (neutrons and protons). The electrons

spin around the atom's nucleus, which contains the other particles. The spinning electrons form tiny magnetic forces. Sometimes many of the electrons in an object spin in the same direction. In these cases, all the tiny magnetic forces from the electrons add up to make the object one big magnet.

It is possible to make a magnet by taking an existing magnet and rubbing another piece of metal with it. The new piece of metal must be rubbed continuously in the same direction. This will make the electrons in that metal start to spin in the same direction.

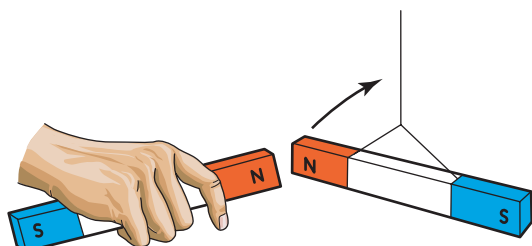
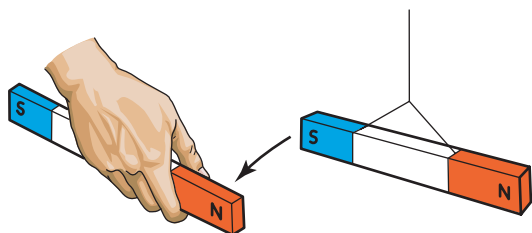
Electricity can also create magnets. Electricity is a flow of electrons. As electrons move through a piece of wire they have the same effect as electrons spinning around the nucleus of an atom. This is called an electromagnet.



Small, thin pieces of iron are attracted to a red bar magnet. The pieces of iron line up to show the magnetic field of the magnet.

Did You Know?

In the photo, the magnetic field is strong where the pieces of iron are close together. The field is weak where the pieces are far apart.



Bar magnets can show how unlike poles attract each other and like poles repel each other.

Hard and Soft Magnets

Because of the way their electrons are arranged, the metals iron, steel, nickel, and cobalt make good magnets. Once these metals become magnets, they can stay magnets forever. Then they are called hard, or permanent, magnets. But these metals and others can also act like magnets only sometimes, after they have been near a hard magnet. Then they are called soft, or temporary, magnets. Most other materials—for example, water, air, and wood—have very weak magnetic properties.

Properties of Magnets

Magnets strongly attract objects that contain iron, steel, nickel, or cobalt. Magnets also attract or repel (push away) other hard magnets. This happens because every magnet has two opposite poles, or ends: a north pole and a south pole. North poles attract the south poles of other magnets, but they repel other north poles. Likewise, south poles

attract north poles, but they repel other south poles.

The magnetic forces between the two poles of a magnet create a magnetic field. This is the area affected by the magnet. A magnetic field surrounds all magnets.

Uses

One of the earliest uses of magnets was in compasses. A compass is a needle-shaped magnet that is free to turn around. The planet Earth is a giant magnet. Because the south pole of a compass is attracted to the north pole of Earth, the compass needle always points north.

Today magnets are found in many places. Magnets hold papers on refrigerator doors. They also hold the doors shut. Credit cards have a magnetic strip. Automatic doors, stereo speakers, and many electric motors use electromagnets.

► More to explore

Compass • Electricity • Iron • Metal

Magnolia

Magnolias are trees and shrubs. They are known for their large flowers. People plant magnolias in parks and gardens. Some magnolia wood is used to make furniture.

There are about 80 species, or types, of magnolia. They grow in North America, Central America, and Asia.

Many magnolias are about 40 to 80 feet (12 to 24 meters) tall. They usually have smooth, gray bark. Their leaves are large

Did You Know?

If a bar magnet is cut in half, each half becomes a complete magnet with a north pole and a south pole.



Magnolias are known for their large, beautiful flowers.

and oval. Some magnolias are evergreen. This means that they keep their leaves year-round. Others are deciduous. They lose their leaves in winter.

The flowers of a magnolia are white, yellow, pink, or purple. They can be 10 inches (25 centimeters) or more across. Most magnolia flowers have 6 to 12 large petals. They usually bloom in the spring and early summer. Some flowers have a beautiful smell. After flowering, magnolias produce a fruit shaped like a cone. Inside are reddish seeds. The fruit splits open in the fall. When this happens, the seeds hang down by thin threads.

Many types of magnolia are popular. The southern magnolia has large, white flowers that smell like lemons. The big-leaf magnolia grows up to 50 feet (15 meters) high. Leaves of the umbrella tree are 2 feet (61 centimeters) long. The cucumber tree is named after its fruits, which are shaped like cucumbers.

► More to explore

Flower

Magpie

Magpies are bold, noisy birds that have many calls. They belong to a group of birds called songbirds. However, their voices are rather harsh sounding. Like their relatives the crows, magpies are known for their intelligence. For instance, magpies hide objects and then remember where to find them again. People often keep these birds as pets.

Magpies are in the same scientific family as crows, ravens, and jays. There are several different species, or types, of magpie. Common types include the Eurasian magpie and the black-billed magpie.

Magpies live in Europe, Asia, Africa, and North America. These birds build nests in tall trees. However, they need open grasslands nearby for feeding. Thus they are often found at the edges of forests.



Magpies are intelligent, noisy birds.

Eurasian and black-billed magpies are about 18 inches (46 centimeters) long. They are mostly black except for their white bellies and white patches on their wings. They have long black tails. In sunlight their wings and tails look shiny blue or green. Several types of magpie found mainly in Asia have bright blue or green feathers.

Magpies eat many different kinds of food. They eat insects, dead animals, fruit, seeds, and even the eggs and chicks of other birds. When magpies have too much to eat all at once, they stash food away to eat later.

Magpies have a place in European folklore. Some people think of them as thieves. Others think they bring bad luck.

► More to explore

Bird • Crow • Raven • Songbird

Mahogany

People prize mahogany trees for their hard, reddish brown wood. The most valued species, or types, of mahogany include the West Indies mahogany and the big-leaf mahogany. People have cut down so many of these trees that they are in danger of disappearing.

Mahoganies grow in the tropical areas of the Americas. West Indies mahoganies grow on the islands called the West Indies, in the Caribbean Sea. They also grow in the U.S. state of Florida. Big-leaf mahoganies grow in Central and South America.



The beautiful, hard wood from mahogany trees is often used to make fine furniture.

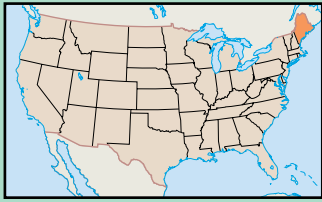
West Indies mahoganies are usually 40 to 50 feet (12 to 15 meters) tall. Big-leaf mahoganies may grow as high as 150 feet (45 meters). Both types have large, green leaves made up of several parts called leaflets. Mahoganies grow alone or in small clusters. There are no forests of these trees.

People value mahogany wood for its strength and its beautiful texture and color. They use the wood to make high-quality furniture, wood paneling, musical instruments, and boats.

Because so many people want mahogany wood, many of the trees have been chopped down. The trees take a long time to grow, so they are being lost faster than they can be replaced. Many businesses now use similar wood from Africa or the Philippines instead of true mahogany wood.

► More to explore

Tree



Maine

Maine is the largest of the U.S. states in the region known as New England. It is almost as big as the rest of New England combined. Despite Maine's physical size, it has a smaller population and fewer big cities than the other New England states. The capital is Augusta.

The origin of the state's name is uncertain. It may have been named for the former French province of Maine. Some historians believe that the state got its name for being the "mainland," as opposed to the coastal islands. Because of its great forests, Maine is nicknamed the Pine Tree State.

Geography

Maine is bordered on the northwest by the Canadian province of Quebec and on the northeast by the Canadian province of New Brunswick. The Atlantic Ocean forms the southern border. Maine's southwestern border is shared with the state of New Hampshire.

Maine is known for its rugged, scenic coast. Offshore there are about 1,200 small islands. However, most of the state consists of a rocky plateau with many lakes and valleys. The White Mountains (part of the Appalachian Mountains) extend from New Hampshire into western Maine. The state's highest point is 5,269-foot (1,606-meter) Mount Katahdin. Maine



has short summers and long, cold winters that can be very snowy.

Maine is heavily forested and contains a good deal of wildlife. Moose, deer, black bears, otters, muskrats, foxes, raccoons, and a variety of birds live there.

People

The Penobscot, the Passamaquoddy, and other Native American groups were living in what is now Maine when Europeans first arrived. Members of these groups still make up a small portion of Maine's population. The area was later settled mostly by English and Scots-Irish Protestants. Their descendants make up the majority of the population. The second largest group is of French heritage.



Camden is a scenic town on the coast of the U.S. state of Maine.

Nonwhites make up less than 4 percent of the population.

Only two fifths of Maine's people live in urban areas. Portland is the state's major seaport and its largest city. It has about 65,000 residents. Lewiston and Bangor are the only other cities with populations of more than 30,000.

The University of Maine is the state's largest public institution of higher education. Its main campus was founded at Orono in 1865. Some of Maine's private schools are Bates, Bowdoin, and Colby colleges.

Economy

Maine's natural resources are important to its economy. The forests provide trees that are harvested for wood and paper products. Its land produces potatoes, dairy products, and blueberries. From the Atlantic, the state's fishermen catch lobsters and other seafood.

Tourism also contributes to the state's income. The hotels, restaurants, and businesses that cater to tourists are part of Maine's service industry. Other significant service areas are trade, government, real estate, and health care.

History

In 1603 Maine became a part of the French province of Acadia. During the 1600s the British also established and maintained scattered settlements throughout the region. The area was a constant battleground, however, until the British conquered the French in eastern Canada in 1763.

Maine was governed as a district of Massachusetts from 1652 until it entered the Union in 1820 as the 23rd state. For many years the United States and Canada disagreed over the state's northern boundary. An 1842 treaty finally resolved the dispute.

Maine's economy grew steadily from 1830 to 1860, but the American Civil War (1861–65) took workers away from the state. In the first half of the 1900s shipbuilding became a major industry in Bath and Portland. Many ships were needed during World War I and World War II.

Overall, development of the state has often been slow. This is partly because many people wish to preserve the natural beauty of the state. Maine's population has grown slowly as well.

► More to explore

Augusta

Facts About MAINE

Flag



Population
(2000 census)
1,274,923—
rank, 40th state;
(2008 estimate)
1,316,456—
rank, 40th state

Capital
Augusta

Area
35,385 sq mi
(91,646 sq km)—
rank, 39th state

Statehood
March 15, 1820

Motto
Dirigo (I Direct)

State bird
Chickadee



State flower
White pine cone
and tassel



Maize

► see Corn.

Majuro



A diver explores a coral reef in the waters of Majuro, the capital of the Marshall Islands.

Majuro is the capital of the Marshall Islands, a country in the Pacific Ocean. Majuro is an atoll, or a ring of coral islands surrounding a pool of water.

Majuro is home to almost half the people of the Marshall Islands. Most of the people of Majuro live on three small, connected islands. These islands have government buildings, a college, and a cultural museum.

Most of the Marshall Islands' economic activity takes place in Majuro. Many people have jobs in government or tourism. Fish and coconut processing are big industries.

After World War II the Marshall Islands were governed by the United States. The U.S. government gave up control in 1986. Then Majuro became the capital of the independent Marshall Islands.

► More to explore

Coral • Marshall Islands

Makeup

► see Cosmetics.

Malabo



Population
(2003 estimate)
92,900

Malabo is the capital of Equatorial Guinea, a country of western Africa. The city lies on the coast of Bioko, an island in the Atlantic Ocean.

Malabo is Equatorial Guinea's center of business and banking. It is also a major port. In addition, oil is produced off the coast of Bioko. The oil industry brings money to Malabo.

Hundreds of years ago Bioko was a stopping point for slave traders. In 1827 Great Britain founded Malabo on the island. For several years the British used Malabo as a base for their ships. They



Palm trees and other lush vegetation grow along the coast of Malabo, Equatorial Guinea. The city has a warm and rainy climate.

were working to end the area's slave trade. Freed slaves began to settle the town.

For much of the 1800s and 1900s Spain ruled Bioko and some nearby land as a colony. Equatorial Guinea became an independent country in 1968 with Malabo as the country's capital.

► More to explore

Equatorial Guinea

Malaria

Malaria is a serious disease spread by mosquitoes. It affects people in tropical parts of the world. Most people who get malaria recover. Still, at least 1 million people die from malaria each year. Most of them are children in Africa.

Malaria is caused by tiny living things called protozoans. Mosquitoes carry the

protozoans. When an infected mosquito bites a person, the protozoans enter the person's blood. They live inside red blood cells as parasites. They take everything they need to live from the cells, which kills the cells.

The symptoms, or signs, of malaria usually begin between one week and one month after the mosquito bite. They include high fever, chills, and headache. A condition called anemia is another common effect of malaria. A person with anemia does not have enough red blood cells. This may cause pale skin, weakness, and dizziness. Malaria can also affect the organ called the spleen, which filters the blood. It can cause the spleen to grow too large.

Malaria can be prevented by keeping down the number of mosquitoes in tropical areas. People can also take medicines that fight the disease.

► More to explore

Disease, Human • Mosquito • Parasite
• Protozoan



In places where malaria is common, people can use nets over their beds to prevent mosquitoes from biting them and spreading the disease.

Did You Know?

The bark of the cinchona tree contains quinine. It has been used to treat malaria since the 1600s.



Malawi

The country of Malawi is located in southeastern Africa. It lies west of Lake Nyasa, one of the deepest lakes in the world. Before the country gained independence it was called Nyasaland. The capital of Malawi is Lilongwe.

Malawi shares borders with Tanzania, Mozambique, and Zambia. Mountains and plateaus, or high, flat areas, cover much of the country. A deep valley called the Great Rift Valley runs along Malawi's eastern border. The valley contains Lake Nyasa.

Grasses cover the dry, low areas. Some trees grow on the plateaus. Evergreen forests grow in the wettest highlands. Malawi's animals include antelope, buffalo, elephants, leopards, lions, rhinoceroses, and zebras.

Malawi's ethnic groups include the Chewa, Nyanja, Tumbuka, Tonga, Lomwe, Yao, and Ngoni peoples. Most



Homes are clustered along the shore of Lake Nyasa, which is also called Lake Malawi.

people speak the Chichewa language. English and other African languages are also common. More than half of the people are Christians. Many others follow Islam or traditional African religions. Most people live in rural areas.

Malawi's economy is based on farming. Important crops include tobacco, sugarcane, tea, peanuts, cotton, and coffee. Manufacturers make mainly food products, beverages, and clothing.

Humans have lived in what is now Malawi for more than 10,000 years. In the 1400s Bantu-speaking peoples founded a kingdom known as the Maravi Confederacy. Great Britain took over the area in the 1880s and 1890s. Malawi won independence in 1964. Malawi's first president ruled until 1994, when the country held democratic elections.

► **More to explore**
Lilongwe

Facts About MALAWI



Population
(2008 estimate)
13,932,000

Area
45,747 sq mi
(118,484 sq km)

Capital
Lilongwe

Form of government
Republic

Major cities
Blantyre,
Lilongwe, Mzuzu,
Zomba, Karonga



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Malaysia

The country of Malaysia is a part of Southeast Asia. Malaysia consists of two areas of land that are about 400 miles (650 kilometers) apart. Kuala Lumpur is the capital and largest city.

Geography

The South China Sea separates the two parts of Malaysia, West Malaysia and East Malaysia. West Malaysia is on the continent of Asia. It borders Thailand to the north. The island country of Singapore lies to the south. The island of Sumatra, which is part of the country of Indonesia, lies to the southwest. Mountain ranges run from north to south in West Malaysia.

East Malaysia sits on the northern part of the island of Borneo. Mountains separate East Malaysia from the Indonesian province of Kalimantan, which takes up the southern part of the island. East Malaysia surrounds the kingdom of Brunei, which lies on the northern coast.

Malaysia is hot and humid year-round. All parts of the country receive plenty of rain.

Plants and Animals

Rain forests cover more than half of the country. The forests contain at least 2,500 kinds of trees and 800 types of orchids.

Malaysia's animal life includes elephants, tigers, leopards, wild oxen,

small bears, wild pigs, orangutans, monkeys, deer, and some rhinoceroses.

Crocodiles, lizards, turtles, and many birds also live in the country.

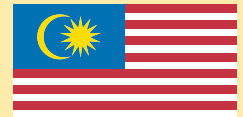
People

More than half of Malaysia's people are Malays. Most of them follow Islam and speak Malay. There are also more than 25 groups of other native peoples. They mostly follow traditional religions. About a quarter of Malaysia's people are Chinese. Most of them are Buddhists. Indians and other South Asians form a smaller group. They follow Hinduism or Islam. Many of them speak Tamil.

Most of the country's people live in West Malaysia. More than half of the population lives in cities.

Economy

Industry and international trade are important parts of Malaysia's economy.



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Muslim girls in Malaysia usually wear veils. Wearing veils or head scarves is a common practice among women who follow the religion of Islam.

Manufacturers make electronics, chemicals, metals, machinery, and clothing. Malaysia also produces many raw materials that it sells to other countries. It is the world's largest producer of palm oil and a major producer of natural rubber and tin. In addition, Malaysia has good supplies of oil and natural gas.

Agriculture is also important to the economy. Rice is the main food crop. Other crops include cocoa, pepper, coconuts, and bananas. The sea provides a large supply of fish. The rain forests are a source of wood.

History

Human bones and tools found in East Malaysia date back about 40,000 years. People have lived in West Malaysia for at least 6,000 to 8,000 years.

In the AD 100s or 200s small kingdoms developed in West Malaysia. Travelers from India brought Hinduism and Buddhism to the region. Indian and Arab

traders later brought Islam. Islam spread widely from the 1200s to the 1600s.

After about 1400 an important spice trade grew at the port of Melaka, in West Malaysia. The Portuguese captured Melaka in 1511. In 1641 the Dutch took over. The British gained Melaka from the Dutch in 1824.

In the early 1900s several British colonies occupied the territory that is now Malaysia. Japan took them over during World War II (1939–45). Great Britain got them back after the war ended. In 1963 these colonies and Singapore formed the independent Federation of Malaysia. Singapore left the federation in 1965.

As an independent country, Malaysia faced problems between its many groups of people. Many Malaysians also disagreed with the government. Nevertheless, Malaysia built a strong economy.

► More to explore

Kuala Lumpur • Rain Forest



A farm worker in Malaysia stacks oil palm fruits. The fruits provide oil for making margarine, soap, and many other goods.

Facts About MALAYSIA



Population
(2008 estimate)
27,027,000

Area
127,335 sq mi
(329,847 sq km)

Capital
Kuala Lumpur

Form of government
Federal constitutional monarchy

Major cities
Kuala Lumpur,
Ipoh, Klang,
Petaling Jaya,
Johor Bahru

Malcolm X



Malcolm X

Malcolm X was an African American religious and political leader in the 1950s and 1960s. His proud stand won him many followers but also made him many enemies.

Early Life

Malcolm X was born on May 19, 1925, in Omaha, Nebraska. His name at first was Malcolm Little. His father was a minister. The Little family moved to Lansing, Michigan, in 1929. Malcolm's father was killed in 1931, and Malcolm had a difficult childhood. He dropped out of school after the eighth grade. As a young man he moved to New York City and became involved in crime.

Nation of Islam

Little was in prison when he learned of a group called the Nation of Islam. The Nation of Islam followed some of the

teachings of Islam. It also taught that blacks were superior to whites.

Little joined the Nation of Islam in 1952. He gave up his last name because he believed that slaveholders had given it to his ancestors. He replaced it with an X. The X stood for his unknown African family name.

Malcolm X was a gifted speaker. He won many new members for the Nation of Islam. At the time, the civil rights movement was beginning in the United States. Its leaders sought equal rights for blacks. For example, they wanted black children to be able to attend the same schools as white children. Malcolm X did not agree with the ideas of the civil rights movement. Instead he wanted to establish a separate black nation. He did not rule out violent methods.

Last Years

Malcolm X left the Nation of Islam in 1964. He converted to traditional Islam and took the name el-Hajj Malik el-Shabazz. He made a pilgrimage, or religious journey, to Mecca, Saudi Arabia. He changed his views about whites.

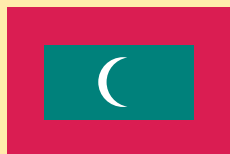
Malcolm X's new beliefs angered some people. On February 21, 1965, he was speaking in New York City when he was shot and killed. Three members of the Nation of Islam were convicted of his murder.

► More to explore

African Americans • Civil Rights Movement • Islam

Did You Know?

Alex Haley wrote *The Autobiography of Malcolm X*. He based it on interviews with Malcolm X.



Maldives

The Republic of Maldives is a chain of about 1,200 small islands in the Indian Ocean. People live on only about 200 of the islands. Male is the capital.

Maldives lies southwest of India. The islands extend more than 475 miles (764 kilometers) from north to south and 80 miles (130 kilometers) from east to west. Maldives has a hot, humid climate.

Maldives' islands are made of coral. The coral sits on the peaks of old underwater volcanoes. Some islands are still being formed. Others are being washed away.

Lots of plants, including coconut palms and breadfruit trees, cover the islands. Many fish and sea turtles live in the waters around the islands.

The people of Maldives have a mixture of Indian, Sri Lankan, and Arab roots. They speak the Divehi language. Nearly everyone is Muslim. Most of the people



Maldives is a group of islands located to the southwest of India in the Indian Ocean.

live in villages on small islands. The population includes many people from other countries who work in Maldives.

Tourism and fishing are the most important parts of Maldives' economy. Workers also build boats, repair boats, and make clothing. A small number of people grow fruits and vegetables.

People from southern Asia came to Maldives more than 2,000 years ago. By the AD 1600s the Dutch controlled the islands. The British took over in 1796.

In 1965 Maldives won full independence from Great Britain. In 2004 a huge wave called a tsunami destroyed some of the islands and killed many people.

► **More to explore**

Coral • Male

Facts About MALDIVES



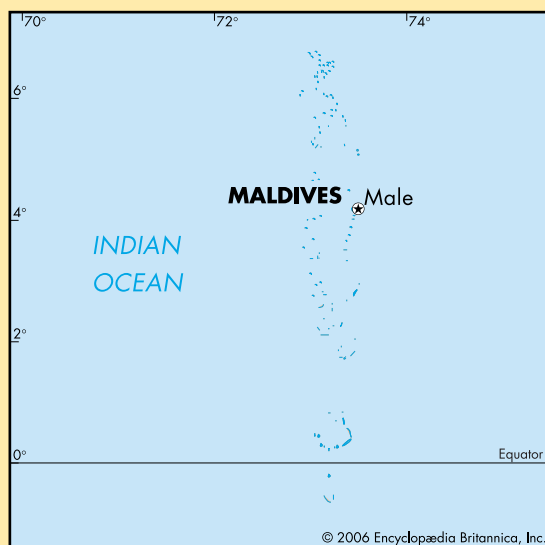
Population
(2008 estimate)
386,000

Area
115 sq mi (298 sq km)

Capital
Male

Form of government
Republic

Major city
Male



Male



Muslims pray at a mosque in Male. Islam is the main religion of Maldives.

Male is the capital of Maldives, a country made up of many small islands in the Indian Ocean. It is the largest city in Maldives. The city occupies all of Male Island, which is the country's largest island.

About one fourth of the people of Maldives live in Male. The city features several schools, markets, and mosques (Muslim houses of worship). It is also home to the National Museum.

Male is a center for trade and tourism. The main goods produced in the city are fish, coconuts, breadfruit, and woven palm mats.

People from Sri Lanka and India settled on the islands of Maldives more than 2,000 years ago. Male has long been the main settlement on the islands. In the 1500s Portugal took control of the islands. Later the Dutch and then the British ruled the islands. In 1965 Maldives became an independent coun-

try with Male as its capital. In 2004 a huge wave called a tsunami flooded much of the city.

► More to explore

Maldives

Malecite

The Malecite were a group of Native American people who lived in what are now Canada and the U.S. state of Maine. They were members of the Abnaki, a larger group of Native Americans who spoke the language called Algonquian.

The Malecite grew corn and hunted and fished for food. They used bark and wood to make tools and weapons. Two chiefs and representatives of each family governed the Malecite.

Europeans began to settle on Malecite land in the 1600s. The Malecite traded with French settlers, and eventually some Malecite people married French people. The French and the English often fought over land in North America. The Malecite sided with the French against the English.

Later the English took over Malecite land. By the middle of the 1800s, the Malecite controlled little land. Today, descendants of the Malecite live in the Canadian provinces of New Brunswick and Quebec and in Maine.

► More to explore

Abnaki • Native Americans



Mali

Mali is a large country in northwestern Africa. Bamako is its capital.

Mali borders Senegal, Mauritania, Algeria, Niger, Burkina Faso, Côte d'Ivoire, and Guinea. Northern Mali lies within the Sahara Desert. The Niger River runs through the south. The land is mostly flat. Most of Mali is hot and dry.

Grasses and mahogany, kapok, and baobab trees grow in the south. The dry north has few plants. Many monkeys, snakes, and birds live in Mali. Other animals include hippopotamuses, lions, hyenas, gazelles, giraffes, and elephants.

Mali has a mixture of many different peoples. Peoples who settle in one place include the Bambara, the Senufo, the Soninke, the Malinke, and the Songhai. The Fulani, the Tuareg, and the Moors often move around in search of water and food for their animals. French is the main language, but people also speak



Women build a house in Mali.

local languages. Most of the population is Muslim.

Mali's economy depends on agriculture. Farmers grow millet, rice, sorghum, cotton, corn, sugarcane, and peanuts. People also raise livestock and go fishing.

As early as AD 300 people traded gold and slaves across the western Sahara. The Ghana, Mali, and Songhai empires ruled the region in turn.

In 1591 Moroccans, or Moors, defeated the Songhai. France took over in the late 1800s. Mali gained independence in 1960. The military ruled the country for many years. Mali finally held free elections in 1992.

► **More to explore**
Bamako • Mali Empire

Facts About MALI



Population
(2008 estimate)
12,324,000

Area
482,077 sq mi
(1,248,574 sq km)

Capital
Bamako

Form of government
Republic

Major cities
Bamako, Sikasso, Ségou, Mopti, Gao



Mali Empire

The great empire known as Mali thrived in West Africa from the 1200s to the 1500s. It grew from a small kingdom called Kangaba on the Niger River to a vast area that included some of the most important trading regions of the time. Trading and gold mining made Mali rich.

Mali was a kingdom of the Malinke people. The founder was named Sundiata. He took control of Kangaba in about 1230. He then started to take over surrounding lands that had valuable minerals such as gold and salt. His empire grew rapidly.

The most famous Mali emperor was Musa. Musa was a Muslim, even though many of his people worshipped traditional gods. His grand pilgrimage (religious trip) in 1324 to the holy city of Mecca made Mali famous. It was said that he brought with him 60,000 richly



An illustrated map from the 1300s shows the Mali emperor Musa (lower right) seated on his throne.

dressed followers and slaves. It was also said that each one of the 80 camels in his caravan carried 300 pounds (135 kilograms) of gold.

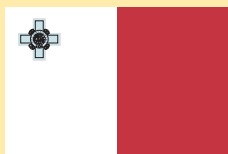
Musa added the trading cities of Timbuktu and Gao to his empire. He ordered many buildings to be built in these cities and other places. Some of these buildings were mosques, or Muslim places of worship, including the Great Mosque in Timbuktu. Musa also supported artists and scholars.

The empire began to decline in the 1400s. Some of the cities rebelled against their Mali rulers, and others were attacked by neighboring people. By 1550 Mali had lost most of its power. The name Mali lives on today in the modern country of Mali.

► More to explore

Islam • Mali





Malta

Malta is a small island country in the Mediterranean Sea. Its capital is Valletta.

Geography

Malta lies just south of Sicily, an island belonging to Italy. The country consists of five islands: Malta, Gozo, Comino, Kemmunnett (Comminotto), and Filfla. Malta is the largest island. The islands are mostly low and rocky.

Plants and Animals

Malta's islands have few wild plants. Animals in Malta include hedgehogs, weasels, shrews, and bats.

People

The people of Malta have a mixture of Italian, Arab, English, and other roots. Almost everyone is Roman Catholic. English and Maltese are the main languages. The Maltese language is a form of Arabic, but it is written in the Latin alphabet (the alphabet used for English).



Valletta, the capital of Malta, is located on the northeastern coast of the main island.

Economy

Tourism is Malta's major industry. Ship repair and other services are also important. Factories make electronics, clothing, and plastic products. Small farms grow vegetables, wheat, and fruits.

History

People have lived on the Maltese islands for more than 5,000 years. Invaders from Carthage, a city in North Africa, arrived in Malta by the 500s BC. The ancient Romans took over the islands in 218 BC. Arabs, Normans, and Roman Catholic knights later ruled Malta. The knights built many palaces and military forts. Great Britain won control by 1814. Malta gained independence in 1964.

► More to explore

Knight • Mediterranean Sea • Valletta

Facts About MALTA



Population
(2008 estimate)
412,000

Area
122 sq mi (315 sq km)

Capital
Valletta

Form of government
Republic

Major localities
Birkirkara,
Qormi, Mosta,
Zabbar, Valletta

Malvinas

► see Falkland Islands.

Mammal

A mammal is an animal that breathes air, has a backbone, and grows hair at some point during its life. In addition, all female mammals have glands that can produce milk to feed their young. Mammals are among the most intelligent of all living creatures. They have an ability to learn that no other type of animal can match.

Mammals include a wide variety of animals, from cats to humans to whales. There are about 5,000 species, or kinds, of living mammal. More than half of all mammals are rodents, a group that includes mice and squirrels.



A polar bear mother feeds milk to her two cubs. Mammals are the only animals that nurse their young.



Although dolphins look like fish and live in the water, they are actually mammals.

Where Mammals Live

Mammals are found in every major habitat around the world. Most mammals live on land—on the ground, in trees, or even underground. Some mammals—including otters, beavers, and seals—live on land and in the water. Whales, dolphins, and manatees are mammals that spend their whole life in water.

Physical Features

Mammals range in size from a tiny bat to a huge whale. The Philippine bamboo bat weighs only about 0.05 ounce (1.5 grams). The blue whale is the largest animal on Earth. It may be more than 100 feet (30 meters) long and may weigh 200 tons (180,000 kilograms).

Bats and whales are unusual mammals, however. Most mammals have four legs for moving around on land. But bats have two wings for flying and two hind legs for grasping. Whales have two flippers and a tail for swimming.

Mammals are the only animals that nurse their young with milk that they produce. The female has special glands called mammary glands. After childbirth, the mother's glands produce milk. The mother feeds the young with this milk until the young are old enough to get food for themselves.

All mammals have hair at some stage of development. Many whales have hair only before they are born. But other mammals have thick coats. Hair helps to keep the body warm. The color and pattern of the hair also may help a mammal to blend in with its surroundings. This may keep a mammal hidden from its enemies. In some mammals, hair takes a special form. The hair of porcupines is hardened into sharp spines. A cat's whiskers are special hairs that are highly sensitive to touch.



Highland cattle have long coats of hair. All mammals grow hair at some point in their development.

Mammals are warm-blooded. This means that they are able to keep their body at roughly the same temperature no matter what the surrounding temperature is. This allows mammals to live in a wide range of climates.

Finally, mammals have a highly developed brain. The mammal brain is the most complex organ known. This complex brain allows mammals to learn from experience and adapt, or change, their behavior.

Behavior

Young mammals learn many behaviors—for example, how to hunt—from their parents. Some young mammals go off on their own once they have grown up. Others stay within their family groups for life.

Individual mammals or groups may live in areas called territories. These mammals may fight off other mammals of the same species that try to enter their territory. Some groups of mammals migrate, or move between places during different seasons.

Some mammals, including ground squirrels and hedgehogs, hibernate during winter. Hibernation is a very deep form of sleep during which an animal's body temperature drops.

Mammals eat a wide variety of foods. Mammals that eat other animals are called carnivores. Cats, dogs, weasels, walrus, and many other mammals are carnivores. Mammals that eat plants—such as lemmings, deer, cattle, and

elephants—are called herbivores. Mammals that eat both animals and plants are called omnivores. Omnivores include raccoons, bears, and primates.

Reproduction



Some mammals, including humans, are born helpless. Other mammals have babies that can walk within hours after birth.

Mammals reproduce through mating. In nearly all mammals, the female carries the developing young in her body after mating. The young develop inside a part of the mother's body called the uterus, or womb. They receive nutrition through the mother's body.

Gestation, or the length of time that the mother carries the young in the womb, varies between species. Pregnancies in hamsters last about two weeks. Elephants may be pregnant for up to 22 months. Human pregnancies last about nine months.

Nearly all female mammals give birth to live young. At birth, the young of some mammals are well developed and able to move about at once. For example, newborn horses and camels can walk within hours after birth. In other mammals—including rabbits and most rodents—the young are born mostly developed but blind, hairless, and helpless.

Marsupials are a group of mammals that give birth to underdeveloped young. Marsupials have short pregnancies of about six weeks. After birth, the young marsupial crawls into a pouch or fold on the mother's belly. The young stays there for several months. It feeds on the mother's milk until it is fully developed. Marsupials include kangaroos, koalas, opossums, and others.

The platypus and echidnas are the only mammals that lay eggs. After the young hatch, they drink milk from their mother, just as other mammals do.

Humans and Other Mammals

Humans have long depended on other mammals for meat and milk. They also have used mammals' skins and hair for clothing and other products. In addition, people have domesticated, or tamed, many mammals. Tamed horses and other animals have provided transportation and have helped in farm work. Tamed cats and dogs have provided companionship.

However, today many mammals compete with humans for food or space. As a result, many species of mammals have died out or exist only in zoos. Other

Did You Know?

Most mammals pant to avoid getting too hot. Humans and some other mammals also get rid of heat by sweating.

types are now endangered because of overhunting or the destruction of their habitats.

► More to explore

Animal • Bat • Cat • Dog • Echidna
• Endangered Species • Gestation • Hair
• Hibernation • Horse • Marsupial
• Platypus • Primate • Rodent • Whale

Mammoth

► see Mastodon and Mammoth.

Managua



Population
(2005 estimate)
908,892

Managua is the capital of Nicaragua, a country in Central America. It is the largest city in Nicaragua. It lies on Lake Managua.

Managua is Nicaragua's center for education, business, and manufacturing. Many people in the city work in government or business offices, banks, schools, and hospitals. Factories in the city produce such goods as oil, furniture, cloth, chemicals, and foods.

Hundreds of years ago American Indians settled a town on the site of what is now Managua. Spain ruled the area from the



A view of Managua, Nicaragua, includes Lake Managua in the background.

1500s until the early 1800s. Nicaragua became an independent country in 1821. Managua became the country's capital in 1857.

Major earthquakes in 1931 and 1972 nearly destroyed Managua. Each time much of the city had to be rebuilt. In the late 1970s heavy fighting took place in Managua between rebels and government troops. In 1998 Hurricane Mitch damaged many homes, farms, and roads in and around Managua.

► More to explore

Nicaragua

Manama



Population
(2001 census)
143,035

Manama is the capital of the Middle Eastern country of Bahrain. The city is



The Grand Mosque in Manama, Bahrain, can hold about 7,000 people.

on Bahrain's main island, which is also named Bahrain. Manama is an important port in the Persian Gulf. It is also the country's largest city.

The government of Bahrain has used money from the oil industry to help build the economy in Manama. The city is a major center of banking in the Middle East. Much of the country's business takes place in the city. Shipping goods through the port also brings money to Manama.

Arab Muslims have lived in Bahrain for hundreds of years. Portugal ruled Manama and the rest of Bahrain for much of the 1500s. Persian rulers took control of the area in 1602. In 1783 a family from Arabia took control of Bahrain. Great Britain began controlling the country's foreign affairs in the 1800s. In 1971 Bahrain became an independent country with Manama as its capital.

► **More to explore**
Bahrain

Manatee

Manatees are slow-moving mammals that are shaped like seals. From a distance they can look like a person who is swimming. For this reason manatees may have inspired people to create stories about mermaids. Mermaids are mythical creatures that are part human and part fish.

Manatees live in rivers and shallow, coastal waters. There are three species, or types, of manatee. The Amazonian manatee lives in the Amazon River and other freshwater in South America. The African manatee lives in tropical West Africa. The Caribbean manatee is found in Florida and the West Indies.

Adult manatees may reach a length of 15 feet (4.6 meters) and a weight of 3,650 pounds (1,660 kilograms). They use their flat, rounded tails to move forward. Like all mammals, manatees have lungs. In order to breathe, they must swim to the water's surface for air. Manatees are herbivorous, meaning that they eat



A young manatee (left) swims with an adult female manatee.

plants. They use their flippers to push the food toward their mouths.

Manatees live alone or in small family groups. Females give birth to one calf, or baby, every two to three years.

All three types of manatee are declining in number. In some cases, the water where they live has become polluted. Many manatees have also been hurt or killed by boat propellers. Most areas now have laws protecting manatees.

Mandan

The Mandan are Native Americans who traditionally lived along the Missouri River in what is now North Dakota. Today most Mandan live on a North Dakota reservation with the Arikara and Hidatsa peoples.

The Mandan traditionally lived in dome-shaped, earth-covered homes called lodges. These lodges were large enough to house as many as 50 people. The Mandan grew corn, beans, squash,



The Mandan lived in earth homes called lodges.

and pumpkins. They also fished and hunted for food.

In the early 1700s French explorers arrived in Mandan lands. The Mandan welcomed the settlers who followed. The tribe became wealthy by trading with them. But many Mandan fell ill with deadly diseases brought by the settlers, such as smallpox and cholera. In 1837 an outbreak of smallpox killed all but about 100–150 of the Mandan.

The surviving Mandan went to live with the Hidatsa on the Fort Berthold Reservation in what is now North Dakota. The Arikara people joined them later. In 1934 the tribes of Fort Berthold became known as the Three Affiliated Tribes. At the end of the 20th century there were fewer than 500 Mandan. Most lived on the reservation.

► More to explore

Arikara • Hidatsa • Native Americans

Mandela, Nelson

Nelson Mandela spent almost 30 years in prison for fighting against apartheid in South Africa. Apartheid was a government policy that separated people of different races. After being freed from prison, Mandela became South Africa's first black president.

Nelson Rolihlahla Mandela was born on July 18, 1918, in Umtata, South Africa. He graduated from the University of South Africa in 1941. Then he studied law and became a lawyer.



Nelson Mandela

Mandela wanted equal rights for South Africa's black people. Although blacks made up most of the country's population, whites controlled the government. Blacks had few rights under apartheid. In 1944 Mandela joined a group called the African National Congress (ANC). The ANC was leading the fight against apartheid. In 1949 Mandela became a leader of the ANC.

Mandela's work got him in trouble with South Africa's government. In 1962 the government put him in prison. Mandela became famous during his years in prison. South Africa's blacks worked to free him. So did people in other countries who opposed apartheid.

In 1990 South African President F.W. de Klerk finally freed Mandela. The next year Mandela became president of the ANC. Mandela and de Klerk worked together to end apartheid. They wanted to make South Africa a democracy in

which all the people could take part. In 1993 the two men were awarded the Nobel peace prize.

South Africans of all races voted in an election in 1994. Mandela was elected president. He improved housing, education, and living standards for blacks. Mandela stepped down as head of the ANC in 1997. He retired from politics in 1999 after one term as president.

► More to explore

African National Congress • Apartheid
• South Africa

Mango

A mango is the fruit of a tree that grows in warm parts of the world. The mango tree is a member of the sumac, or cashew, family. Its scientific name is *Mangifera indica*.

The mango tree first grew in India and parts of eastern Asia. Today people grow the tree in the Americas and Africa as well.



Mangoes are widely grown in tropical areas of the world.

Did You Know?

The mango tree is an ever-green tree of the cashew family.

The mango tree may grow to 60 feet (18 meters) tall. The fruits develop from small, pinkish flowers. The smallest mangoes are the size of a plum. The largest mangoes weigh as much as 5 pounds (2.3 kilograms). Mangoes may be round, oval, kidney-shaped, or heart-shaped. Their smooth, thin skin may be green, red, yellow, purple, or a combination of these colors. Their juicy flesh is yellow-orange. They have one large pit, or seed, inside.

Mangoes are a major source of food in India, the West Indies, and other places. People eat mangoes fresh and in main dishes and desserts. People also use mangoes to make sauces called chutneys. Mangoes are rich in vitamins A, C, and D.

► More to explore

Fruit • Tree

Mangrove

Mangroves are trees or bushes that grow in thick clusters along seashores and riverbanks. They have a thick tangle of roots that sticks up through the mud. These roots help to keep waves from washing away the dirt and sand of the coastline.

There are more than 60 species, or types, of mangrove. They are found in and near the tropical parts of Asia, Africa, Australia, and the Americas.

Mangroves can grow in places where very few other trees can. They can grow in salty water because they are able to



Mangroves have tangled roots that are partly aboveground.

filter out the salt from the water they need. They can stand in soft, wet soil because of their strong roots. Plus, unlike other trees, mangroves do not have to struggle to get air from wet soil. Instead, they take oxygen through holes in their aboveground roots.

Mangroves can be short bushes, or they grow to about 130 feet (40 meters) tall. The common mangrove reaches a height of about 30 feet (9 meters). A mangrove's leaves are typically green and may be fuzzy or waxy. The flowers can be yellow or white.

Mangroves have hard wood that people use to make boats and other products. The bark of the common mangrove is full of tannin. Tannin is a chemical used for turning animal hides into leather. The fruit of some mangroves can be eaten. Also, mangrove leaves, roots, and bark have been used in medicine.

► More to explore

Root • Tree

Manila



Population
(2007 estimate)
1,660,714

Manila is the capital of the Philippines, an island country in Southeast Asia. It has been the country's main city for about 400 years. It lies on Manila Bay, on Luzon Island. The Pasig River runs through the middle of the city.

A flowering plant called nilad once grew all over the banks of the Pasig River. The city was named Maynilad after this plant. Its name was later shortened to Manila.

Manila is the Philippines' center of business, trade, and industry. It is also the country's main port. Factories in the city

make fabrics, clothes, processed foods, medicines, and many other products.

In the 1500s Manila was a Muslim settlement. Spanish conquerors destroyed the settlement in 1571 and built a new town there. It became the capital of the Spanish colony of the Philippines. Spain ruled the colony for more than 300 years.

U.S. forces captured Manila during the Spanish-American War of 1898. After the war the United States took control of the whole country. It made Manila its headquarters in the Philippines. The city became a center of trade and tourism.

During World War II (1939–45) the Japanese captured Manila. U.S. forces recaptured the city in 1945. Manila was damaged during the fighting but was later rebuilt. In 1946 the Philippines became an independent country with Manila as its capital.

► **More to explore**
Philippines



Manila is a busy, modern city.



Manitoba

Manitoba is one of Canada's three Prairie Provinces. Manitoba is also called the Keystone Province because it is centrally located within Canada, like the keystone in an arch. Its capital is Winnipeg.

Geography

On the west, Manitoba borders Saskatchewan, another of the Prairie Provinces. (Alberta is the third Prairie Province.) Nunavut lies to the north, and the cold waters of Hudson Bay are to the northeast. To the east is Ontario. To the south are the U.S. states of Minnesota and North Dakota.

Flat prairies with rich soils cover much of southern Manitoba. Most of the rest

of the province is rocky land with many forests and rivers. The land near Hudson Bay in the far north is treeless tundra. Manitoba has more than 38,000 lakes. The three largest—Lakes Winnipeg, Manitoba, and Winnipegosis—are in the south.

People

Manitoba has more ethnic groups than any other Canadian province. More than half of its people have ancestors who came from Great Britain or Ireland. People of German, Ukrainian, French, and Polish ancestry also make up large segments of the population. More than 100,000 people have American Indian roots. Most of them are Chipewyan, Assiniboin, Cree, or Ojibwa. The Métis people have both American Indian and European (mostly French) ancestry.

Winnipeg and its suburbs are home to about 60 percent of Manitoba's people. Winnipeg is the largest city in central Canada.

Economy

Manitoba's location in central Canada has made transportation and shipping important to its economy. Lying 60 miles (95 kilometers) north of the U.S. border, Winnipeg is a key linking point for air, railroad, and truck routes. Products made in Manitoba are shipped in all directions. They include foods and drinks, airplane parts, buses, computers, clothing, and paper. Mines in the north produce copper, zinc, nickel, and gold.



About 20,000 farms, mostly on the southern prairies, contribute to Manitoba's economy. Wheat, canola, alfalfa, barley, oats, and flax are the most important crops. Farmers also raise hogs and cattle.

History

The first residents of Manitoba were American Indians who arrived thousands of years ago. European explorers came in the early 1600s. They found that the area was rich in fur-bearing animals. In 1670 the English government created the Hudson's Bay Company to build fur-trading posts in the area. The company faced fierce competition from French fur traders. After the English drove the French from Canada in 1763, the Hudson's Bay Company controlled the whole area.

The Hudson's Bay Company soon had another competitor, a Canadian fur-trading company called the North West Company. In 1811 the Hudson's Bay Company started the first farming colony in Manitoba along the Red River, near what is now Winnipeg. The North



A young polar bear makes its way across ice on Hudson Bay in northern Manitoba.

West Company attacked the colony, but it survived. In 1821 the North West Company became part of the Hudson's Bay Company.

In 1869 the Hudson's Bay Company turned its territory over to the new country of Canada. The Métis who lived in the area feared that the Canadians would take their land and change their way of life. Led by Louis Riel, the Métis rebelled. The Canadian government defeated the rebels, but Riel won rights for his people.

Canada made Manitoba a province in 1870. Manitoba grew slowly at first, but in the early 1900s many immigrants arrived from eastern Canada and Europe. Many of the early settlers were farmers, but mining and manufacturing soon developed. Later in the 1900s Manitoba's government worked to expand the economy in the north.

► More to explore

Assiniboin • Canada • Chipewyan
• Cree • Fur Trade • Hudson Bay
• Hudson's Bay Company • Ojibwa

Facts About MANITOBA

Flag



Population

(2006 census)
1,148,401

Area

250,116 sq mi
(647,797 sq km)

Capital

Winnipeg

Motto

Gloriosus et Liber
(Glorious and Free)

When Manitoba Became a Province
1870



A farmer in Manitoba, Canada, examines his crop of flax.

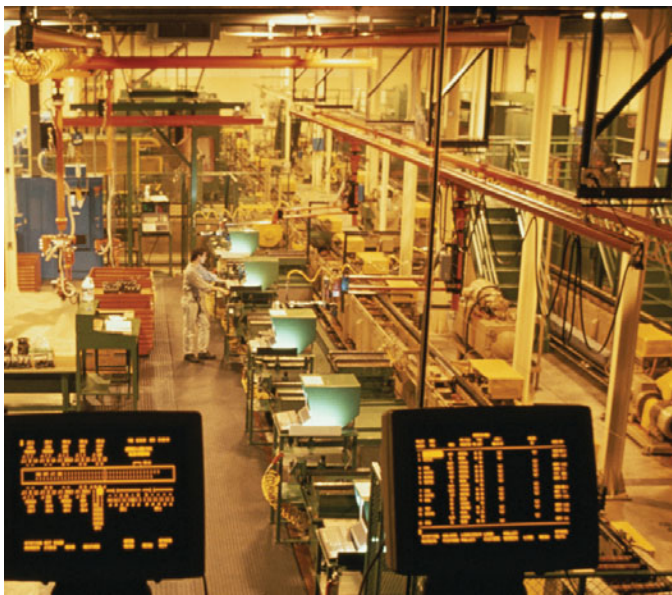
Manufacturing

Manufacturing is the process of making products, or goods. The businesses that make products are called manufacturers. Manufacturers sell their products to people and companies.

Making Products

Manufacturers take raw materials and turn them into products to sell. Raw materials include wood, steel, cloth, and many other materials. Using raw materials, manufacturers make cars, electronics, clothing, furniture, home appliances, machinery, ships, airplanes, and many other goods.

Manufacturers have many different ways of making goods and doing business. They usually use machines to make large amounts of products. Human workers or computers may operate these



Assembly lines are a common sight in factories. Each worker or machine on an assembly line does a certain task over and over again to put products together quickly.

machines. Some manufacturers sell their products to the public. Others sell their products to other companies.

Different companies may work together to create a single product. For example, a shoe manufacturer may not have the equipment to make shoelaces. Or it may not want to take the time to make them. So it buys the shoelaces for its shoes from a shoelace manufacturer.

History

Until about 200 years ago people made most goods either at home or in small workshops. They made products one at a time, by hand. During the 1800s the Industrial Revolution changed how goods were made. Newly invented machines could do jobs that people had to do before. Manufacturers started to build factories to replace small workshops. Factories could make thousands of products quickly and cheaply. This caused the prices of products to fall. People could now buy more types of goods.

However, large numbers of people worked for very long hours in unpleasant, often dangerous, factories. They made little money. Workers soon formed labor movements to demand better working conditions. Today factories in many countries are safer. Workers work fewer hours and get better pay. They also receive benefits such as health insurance and paid vacation time.

► More to explore

Industrial Revolution • Labor

Maori

The Maori were the first people to live on the islands of New Zealand. They arrived on the islands about 1,200 years ago. Their name means “ordinary people.”

The earliest Maori are sometimes called the Moa Hunters. Their main source of food was the moa, a huge flightless bird that is now extinct. After the moas were gone, the Maori ate smaller birds. They also caught fish and grew crops for food.

The Maori were skilled artists. They carved wooden war canoes big enough to hold 100 people. They also excelled in weaving.

According to Maori history, the Maori sailed to New Zealand from a tropical island called Hawaiki. This history says that a “great fleet” of canoes arrived in New Zealand in the 1300s. But experts believe the Maori reached the islands much earlier, by 800. Those experts believe that “Hawaiki” was actually Tahiti.

Dutch explorers arrived in New Zealand in 1642. The Maori fought them and chased them away. Later the Maori welcomed European settlers. In 1840 the Maori accepted British rule. Soon, though, the Maori and the British began fighting over land. The Maori lost much of their land in the wars.

Today the Maori make up about 10 percent of New Zealand’s population.



A Maori man greets a tourist using the traditional Maori form of welcome.

Most Maori live in cities among New Zealanders of European ancestry. Many Maori have kept alive their language and traditional culture. They also have worked to regain control of their traditional lands.

► More to explore

French Polynesia • New Zealand

Mao Zedong

Mao Zedong ruled China from 1949 until 1976. He also led China’s Communist Party. Mao brought major changes to China. Some of these changes led to periods of great disorder in the country.

Early Life

Mao was born on December 26, 1893, in the village of Shaoshan in southeastern China. His parents were farmers. In 1911 Mao fought in a revolution against China’s rulers. The revolution forced China’s last emperor from power.



Mao Zedong

While studying at Beijing University, Mao became interested in Communism. Communists wanted all people to own everything together. Mao came to believe that China should have a Communist government. In 1921 he joined the Chinese Communist Party.

Rise to Power

In the early 1920s the Communists worked together with another party, the Nationalists. In 1926, however, a new Nationalist leader named Chiang Kai-shek turned against the Communists. Mao fought back.

Mao set up a Communist base in south-eastern China. The Nationalists attacked it. Mao then led his forces, called the Red Army, on a journey called the Long March. In 1935 they arrived at a new base in the northwest.

In 1937 the Communists and the Nationalists joined forces to fight the Japanese, who had invaded China. The Japanese were defeated in 1945. Then Mao's forces again fought the Nationalists. The Communists won in 1949. Mao formed the People's Republic of China and became its chairman (leader).

Chairman Mao

Mao tried to transform China's economy. In 1958 he started a program called the Great Leap Forward. Among other changes, he made peasants work on huge farms called communes. The program failed. Farm production went down so much that 20 million people starved to death.

In 1966 Mao began a movement called the Cultural Revolution. His goal was to strengthen the Communists' hold on China. Mao shut down the schools and formed groups of young people called Red Guards. The Red Guards attacked people who disagreed with the government. They also destroyed much property.

The Cultural Revolution weakened China. Even so, it continued as long as Mao lived. He died in Beijing on September 9, 1976.

► More to explore

Chiang Kai-shek • China
• Communism

Map and Globe

A map is a drawing of all or part of Earth's surface. Its basic purpose is to



People can learn about geography by studying a globe.

show where things are. Maps may show visible features, such as rivers and lakes, forests, buildings, and roads. They may also show things that cannot be seen, such as boundaries and temperatures. Most maps are drawn on a flat surface. A map displayed on a round surface is called a globe.

Types of Maps and Globes

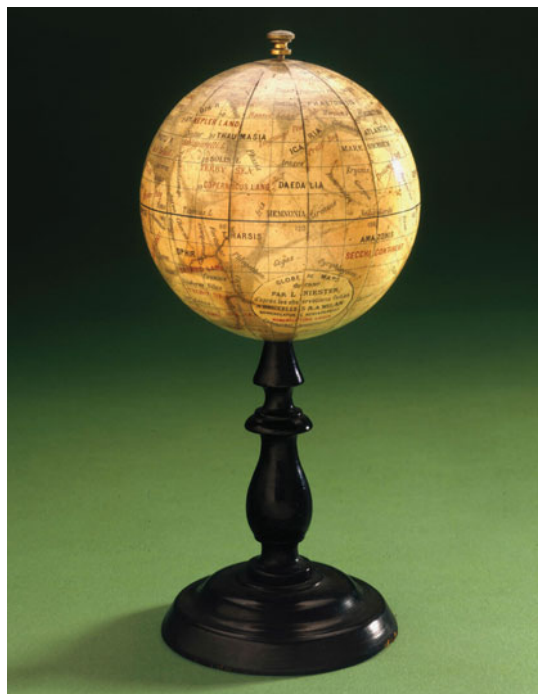
The most familiar kinds of maps are topographic and political maps. Topographic maps show the location and shape of features on Earth's surface. These often include natural features, such as mountains and lakes. They can also include things that humans have built, such as roads, bridges, tunnels, and railroads. Political maps show the boundaries of countries, states, provinces, counties, and cities. Most maps combine features of both topographic and political maps.

Globes provide the same kinds of information that flat maps do. Because Earth is almost round, a globe represents it best. A globe shows Earth as it looks when seen from outer space.

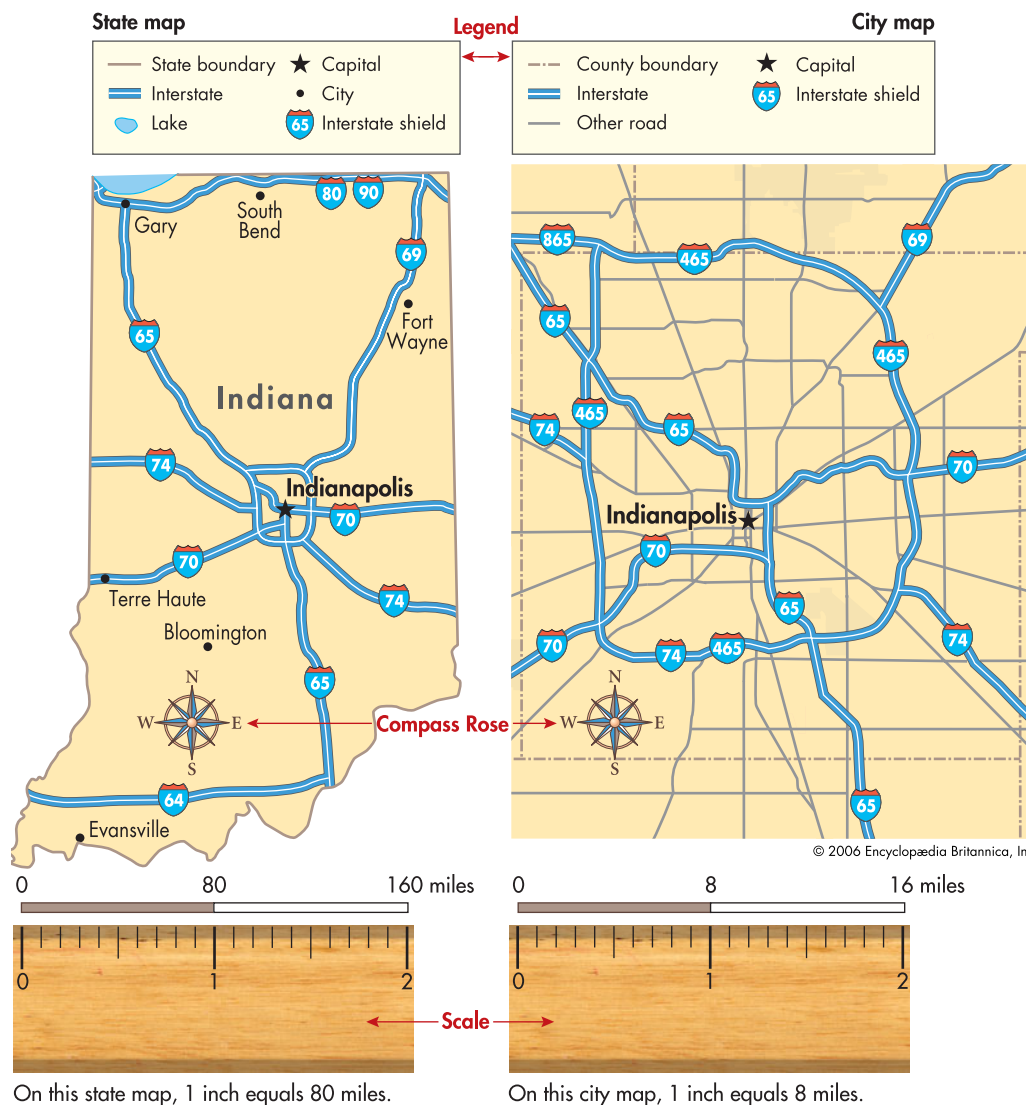
Scale

A map is always smaller than the area it represents. Most maps include something called a scale to show how much smaller the map is. The scale shows how distances on the map are related to the actual distances.

Map scale can be shown in a number of ways. The simplest way is a graphic scale. A graphic scale is a ruled line or bar that is usually marked off in miles or kilometers. Such a scale can be used to measure distances on the map.



Globes can represent planets other than Earth. An astronomer, or person who studies outer space, helped to make a globe of the planet Mars in 1892.



Maps often include a legend, a compass rose, and a scale. The legend is a list of symbols used on the map. The compass rose shows which way is north on the map. The scale shows how distances on the map are related to the actual distances.

Some maps use a mathematical expression called a ratio to describe scale. A ratio is a written way of showing the relationship of two amounts to each other. For example, 1:50,000 is a ratio. If a map has a scale ratio of 1:50,000 it means that one unit on the map is equal to 50,000 of the same units on the ground. If the unit of measurement is a centimeter, then one centimeter on the map equals 50,000 centimeters (500 meters) on the ground.

Finding a Place

Any place on Earth can be located using a system called latitude and longitude. Latitude and longitude are sets of imaginary lines that circle Earth. Lines of latitude run east and west. Lines of longitude run north and south. They are often printed on maps, and they each have a number. Any place can be described by the two numbers that tell where a particular line of longitude crosses a particular line of latitude.

Some maps are divided into sections that are like squares on a checkerboard. Rows across may be lettered “A,” “B,” “C,” and so on. Rows that go up and down may be numbered “1,” “2,” “3,” and so on. These maps often have an index that tells where to find a place by using the letters and numbers. If the index says a place is located at “B 2,” for example, it can be found on the map in the area where the “B” and “2” rows cross.

Map Symbols

In the past mapmakers used drawings to show where things such as castles and mountains were located. The drawings were large so they could be clearly seen.

Over time maps were made more simple. Mapmakers replaced pictures with symbols. Each symbol represents one particular thing. A map may have different symbols for cities, rivers, lakes, roads, railroad tracks, and so on. Mapmakers usually show the most important information using symbols that stand out. For example, a main road may be shown by double black lines with red between them. A legend is a list that describes the symbols used on a map.

History

People began making maps thousands of years ago. The earliest maps showed features that were important to the people in a particular area. The ancient Greeks were the first to show Earth as being round. But their maps only showed the world that was known at the time. Later, as people began to explore

the world, they made maps of where they had been. Today detailed maps show every part of Earth.

► More to explore

Geography • Latitude and Longitude

Maple

Maples are trees and shrubs that are often planted in parks and along city streets. They are good shade trees because their leaves form a thick dome. In autumn the leaves turn spectacular shades of yellow, orange, and scarlet.

There are about 200 different species, or kinds, of maple. They grow throughout much of North America, Europe, and northeastern Asia.

Maples range from small shrubs to large trees. They can grow to be more than 130 feet (40 meters) tall. The leaves usually have several fingerlike sections called lobes. Flowers appear in early spring. They vary from deep red to greenish yellow. Maples also bear papery wings



Sugar maples have sweet sap that is used to make maple syrup.

Did You Know?

The art and science of making maps is called cartography.

containing seeds. These flutter to the ground, scattering the seeds away from the tree. The seeds can grow into new maples.

Maple syrup and sugar come from the sap of the sugar maple. These trees grow in Canada and the United States. People collect the sap in late winter or early spring. They cut holes into the trunk of the tree and gather the sap in buckets. Then they boil the sap to make it thicker. Sugar maples and some other species also provide wood for building furniture and other products.

► More to explore

Tree

Maputo



Population
(2007 estimate)
1,099,102

Maputo is the capital of Mozambique, a country in southeastern Africa. The city lies on a bay of the Indian Ocean. It is the largest city in Mozambique. It is also one of eastern Africa's most important ports.

The economy of Maputo depends heavily on the shipping of goods through the port. The repairing of ships also brings money to the city. Factories



Maputo, the capital of Mozambique, is located on a bay of the Indian Ocean.

in Maputo make processed foods and other goods.

In 1787 the Portuguese built a fort where Maputo is now. A town grew around the fort. The town was originally named Lourenço Marques, after a Portuguese trader. In 1907 it became the capital of Portugal's colonies in East Africa.

In 1975 Mozambique became an independent country with Lourenço Marques as its capital. The city was soon renamed Maputo. Different groups fought for control of Mozambique from the 1970s to the early 1990s. The long war hurt Maputo's shipping and tourism industries.

► More to explore

Mozambique

Marathon

A marathon is a footrace with a distance of exactly 26 miles and 385 yards (42.2 kilometers). Marathon runners usually



The Boston Marathon includes a division for marathoners in wheelchairs.

do not run on a track. Instead they run over land, including city streets.

The marathon is the longest of all the racing events in the Olympic Games. Many cities throughout the world also host their own marathons. The best-known marathons in the United States are the Boston Marathon and the New York City Marathon.

Both men and women compete in the city and Olympic marathons. The fastest runners complete the race in slightly more than two hours.

The marathon's name comes from a legendary event that happened about 2,500 years ago. Marathon was the name of a plain in ancient Greece. There, in 490 BC, a fierce battle broke out between the Athenians and the Persians, who wanted to rule the city-state of Athens. After defeating the Persians, the Athenians supposedly sent a runner

back to Athens to announce the victory. The distance from Marathon to Athens was about 25 miles (40 kilometers). In 1896 the first modern Olympic Games included a marathon race to honor that ancient Greek runner.

► More to explore

Olympic Games • Track and Field

Marconi, Guglielmo

Guglielmo Marconi was an Italian scientist and inventor. He built the first wireless telegraph, which sent messages through the air for the first time. This invention was the starting point for radio.

Marconi was born on April 25, 1874, in Bologna, Italy. At about age 20 he became interested in radio waves. Radio waves are streams of energy that carry electric signals through the air. Marconi thought that radio waves could be used in communication.



Guglielmo Marconi is pictured with his telegraph equipment.

Did You Know?

One of the first uses of Marconi's "wireless telegraphy" was to report the progress of the America's Cup yacht race in 1899.

Marconi experimented with radio waves and the telegraph. The telegraph used at the time could send and receive coded messages in the form of electric signals. However, it needed wires to do so. Marconi created a telegraph that could send electric signals using radio waves. The signals traveled through the air instead of through wires. In 1897 he formed a wireless telegraph business in England. It made him rich.

In 1901 Marconi sent radio signals across the Atlantic Ocean for the first time. Some scientists had thought this could not be done. They believed that radio waves traveled in straight lines. As Earth's surface curved, they said, the waves would go out into space. Marconi believed that the upper level of the atmosphere would reflect the radio waves back to Earth. He was right.

Marconi's wireless telegraph sent messages in the form of coded clicks, like earlier telegraphs did. Then other scientists added their inventions to it. The new devices could also send voices and music.

Marconi was awarded a share of the Nobel prize in physics in 1909. He continued to experiment until his death. He died in Rome, Italy, on July 20, 1937.

► More to explore

Radio • Telegraph

Mardi Gras

Mardi Gras is a festive holiday celebrated with feasts and parades. It comes



A Mardi Gras parade in France includes large balloon figures and colorful, decorated floats.

before the Roman Catholic season of Lent. Lent is a period of 40 days that ends with Easter.

The name Mardi Gras is French for "Fat Tuesday." The holiday takes place on the Tuesday before Ash Wednesday, the first day of Lent. Traditionally during Lent, Roman Catholics stopped eating meat, fish, eggs, and other foods. On Mardi Gras, therefore, households consumed all the remaining foods that they would not be allowed to eat during Lent.

The festivities of Mardi Gras can last for many days before the actual holiday. In some countries this period is called carnival. One famous carnival takes place in Rio de Janeiro, Brazil. This festival lasts about 4 days. New Orleans, Louisiana, has the most famous carnival celebration in the United States. Its Mardi Gras festivities begin about 2 weeks before Fat Tuesday.

► More to explore

Easter

Marie-Antoinette

Marie-Antoinette was the wife of the French King Louis XVI. While the common people of France suffered, Queen Marie-Antoinette spent money wildly and thought only of herself. This helped lead to the French Revolution. Marie Antoinette stood for everything that the people of France disliked about the royal family.

Early Life

Marie-Antoinette was born in Vienna, Austria, on November 2, 1755. Her parents were the emperor and empress of the Holy Roman Empire. When she was 14 years old, she married Louis.

Queen of France

Louis and Marie-Antoinette became king and queen in 1774. At the time, France was a feudal society. This means that the aristocracy, or noble class,

owned the land, and the peasants paid to farm the land. The peasants suffered greatly under this system.

By the late 1700s the country was also running out of money. The French had spent a great deal to help the colonists during the American Revolution. Even though the French people were suffering, the king and queen spent large amounts of money to pay for their expensive lifestyle.

The French people finally rose up in protest and began the French Revolution in 1789. Louis and Marie-Antoinette stayed king and queen, but they became afraid. In 1791 they tried to escape France and move to Austria. The people caught them and took them back to Paris. Marie-Antoinette then asked Austria to help stop the revolution. The French people grew even angrier at her.

Last Days

In August 1792 revolutionaries took Louis and Marie-Antoinette prisoner. In September France became a republic—a country ruled by the people. In January 1793 the people put the king to death. They put Marie-Antoinette to death on October 16, 1793.

► More to explore

French Revolution • Louis XVI



Marie-Antoinette

Did You Know?

According to a famous story, Marie-Antoinette said “Let them eat cake” to someone who told her that the poor people had no bread. The story is probably not true.

Marigold

Marigolds are plants that bear brightly colored blooms. They are popular in flower gardens. People also plant mari-



The French marigold is a bushy plant with bright flowers.

golds among vegetables. Their leaves have a strong scent that can drive away insect pests.

Marigolds are native to southwestern North America, Central America, and South America. There are about 30 different species, or types. They are annual plants, which means that they live for only one year. The most popular varieties include the French and African marigolds.

Marigolds usually grow to a height of about 1 to 5 feet (0.3 to 1.5 meters). Their flowers are usually red, orange, or yellow. There may be just one flower or a few on each stem.

Marigolds grow well in sunny areas. They typically bloom from summer until the first frost.

► More to explore

Flower • Plant

Marines

Marines are a type of soldier. The first marines were soldiers trained to fight aboard warships. Later marines traveled to enemy lands on ships and then went onshore to fight. Today marine forces are still usually attached to navies, or the armed forces of the sea. But marines may serve on land or in the air as well as at sea.

Marines Today

A number of countries have marine forces. They include Brazil, China, France, Indonesia, Mexico, The Netherlands, and Pakistan. The Royal Marines is the marine force of the United Kingdom. It is a part of the Royal Navy.

The United States Marine Corps is the most famous marine force. The U.S. Marine Corps is within the U.S. Department of the Navy. U.S. Marines have served in all the wars of the United States. They are mainly land and air fighters. But they do use ships to attack coastlines and to carry supplies. U.S.



A Sea Knight helicopter used by U.S. Marines lands on a ship near the Philippines.

Marines also provide protection for certain U.S. government workers in foreign countries. The U.S. Marine Corps' motto is *Semper Fidelis*, which is Latin for "always faithful."

History

The use of marines in wars dates back to ancient times. During the 400s BC well-armed soldiers fought aboard Greek warships. During the 200s and 100s BC some Roman soldiers were specially trained to fight on warships as well.

The Dutch and the English organized the first modern groups of marines during the 1660s. It was at this time that the word marine first came into use. However, as cannons and other large guns were developed, marines did less fighting on ships. Today such fighting rarely, if ever, happens.

► More to explore

Navy • War

Marquette, Jacques

Father Jacques Marquette and Louis Jolliet were the first white men to explore the upper Mississippi River. Marquette's writings told Europeans about the river and its course.

Jacques Marquette was born on June 1, 1637, in Laon, France. He became a Roman Catholic priest as a young man. In 1666 Marquette went as a missionary to New France (now Canada). In 1671 he moved to the north shore of the



Straits of Mackinac (a channel that connects Lake Michigan and Lake Huron). There he founded the Saint Ignace mission.

Louis Jolliet, a young explorer, visited Saint Ignace in December 1672. The governor of New France had sent him to explore the Mississippi River. On May 17, 1673, Marquette, Jolliet, and five



A drawing shows Father Jacques Marquette during his travels.

other men set out from Saint Ignace in two bark canoes. They used the Fox and Wisconsin rivers to get from Lake Michigan to the Mississippi River. Marquette preached to the Native Americans along the way.

At the mouth of the Arkansas River, in what is now Arkansas, they learned from the Native Americans that the Mississippi flowed into the Gulf of Mexico. They went no farther because the land further along was Spanish territory. They turned back, though Marquette went only as far as Green Bay, in what is now Wisconsin. There he wrote a report about the journey.

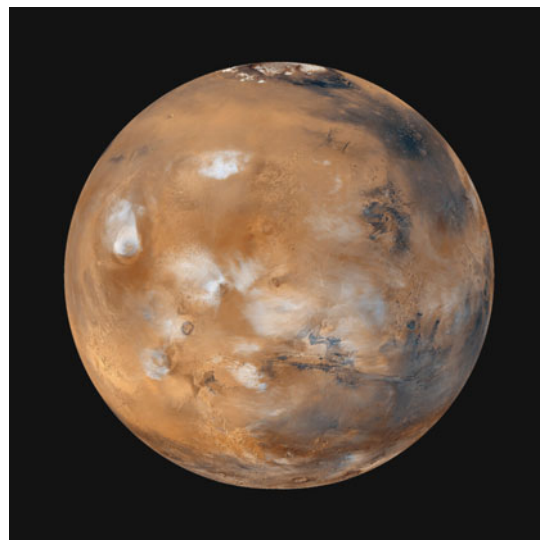
During the journey, Marquette had fallen ill. In 1674 he traveled to what is now Illinois. He wanted to start a mission among a group of Native Americans. He reached them in the spring of 1675, but there his health grew worse. On May 18, 1675, on the way back to Saint Ignace, he died.

► More to explore

Jolliet, Louis • Mississippi River

Mars

Mars is one of the planets that orbit, or travel around, the sun in the solar system. It is the fourth planet from the sun. It is also Earth's outer neighbor. Mars travels around the sun at an average distance of about 142 million miles (228 million kilometers). It has two small, rocky moons, Phobos and Deimos.



A picture of Mars taken by the Mars Global Surveyor shows an ice cap at the top of the planet. White clouds made of water and ice are also visible.

For centuries people have wondered whether there is life on Mars. Studies have shown that there are no obvious signs of life on the planet. However, scientists are still trying to find out if very tiny, simple life-forms may have ever existed on Mars.

Physical Features

Mars is the second smallest planet in the solar system, after Mercury. Its diameter, or distance through its center, is about 4,200 miles (6,800 kilometers). That is about half the size of Earth's diameter. Mars has layers like Earth's. These layers consist of a metal core; a thick, rocky middle; and a crust.

The surface of Mars consists of rock and dust. There are many large dust storms. Parts of the planet have many pits called craters. The landscape includes plains, deep valleys, and high mountains.

Did You Know?

Mars was named for the ancient Roman god of war. People saw the planet's red color and thought of anger and blood.

The atmosphere, or layer of gases, surrounding Mars is thin. It does not trap heat well. The temperature at the surface of Mars is about -28°F (-33°C) in the afternoon. But it cools to about -118°F (-83°C) before dawn.

Water is rare in the solar system, except on Earth. Water exists on Mars as ice caps at its north and south poles, or ends, and as patches of ice beneath its surface. Small amounts of water are also found as a gas in the air. Some evidence suggests that in the past Mars had some liquid water on its surface. For example, Mars has hundreds of channels that look like dried-up riverbeds. Some scientists think Mars was once a warm planet with large seas.

Orbit and Spin

Like all planets, Mars has two types of motion: orbit and spin. Mars orbits, or travels around, the sun. It completes one orbit every 687 Earth days. In other words, a year on Mars lasts 687 Earth

days. Mars spins about its center at nearly the same rate as Earth does. Mars takes about 24.6 hours to complete one rotation. So a Mars day lasts about as long as an Earth day.

Observation and Exploration

People have observed Mars since ancient times. Since 1964 many unmanned spacecraft have collected information about the planet. The United States and the Soviet Union each sent several spacecraft to Mars from the 1960s to the 1980s. Some of them flew past Mars or orbited around it. Others, including the U.S. Viking crafts, landed on Mars.

Since the 1990s the United States and Europe have sent several spacecraft to orbit the planet. They include the U.S. Mars Global Surveyor and Odyssey and Europe's Mars Express.

The U.S. spacecraft Pathfinder landed on Mars in the 1990s. It released a robot

Did You Know?

A volcano on Mars named Olympus Mons is the biggest known volcano in the solar system.



A camera on the spacecraft Pathfinder photographed the rover called Sojourner after the rover was released onto the surface of Mars in 1997.

called a rover onto the surface. They both sent back information about the surface, interior, and atmosphere of Mars. The United States sent two more rovers, called Spirit and Opportunity, to the planet in 2003. The rovers moved around on the surface. They performed experiments and took many photographs.

► More to explore

Planets • Solar System • Space Exploration

Mars, god

► see Ares.

Marsh

A marsh is a type of wetland with watery mud that is rich in minerals. Marshes

are very similar to swamps. The main difference between them is the type of plant life they support. Marshes have mostly grasses, while swamps have mostly trees.

Marshes form in low-lying areas near rivers and along seacoasts. They can have either fresh or salty water. Marshes are especially common in the areas called deltas. These form at the mouths of rivers. The flow of a river slows down near the mouth. The rock and soil that the river is carrying then settles to the bottom. This material is called sediment. It creates a rich mud in which marsh plants grow.

Grasses, sedges, reeds, and rushes are common marsh plants. Rice grown in marshes provides a major portion of the world's grain. It is the most important



Marshland covers a delta region in Alaska. Marshes often form in deltas, which are areas of land at the mouths of rivers.

kind of marsh plant. Crabs, snails, turtles, and many kinds of fish and birds are some of the animals that are found in marshes.

► **More to explore**

Delta • Swamp • Wetland

Marshall, Thurgood

Thurgood Marshall was the first African American to serve as a justice (judge) on the U.S. Supreme Court. Marshall strongly supported equal rights for African Americans.

Marshall was born in Baltimore, Maryland, on July 2, 1908. After attending high school in Baltimore, Marshall graduated with honors from Lincoln University in Pennsylvania. In 1933 he graduated from Howard University Law School in Washington, D.C. He was the best student in his class.

In 1936 Marshall became a lawyer for the National Association for the Advancement of Colored People (NAACP). At that time African Americans did not have the same rights as whites. The NAACP fought in the courts to win equal rights for blacks. In the 1940s and 1950s Marshall argued 32 cases before the Supreme Court. He won 29 of those cases.

Marshall's most important courtroom victory was in the case of *Brown vs. Board of Education of Topeka* in 1954. Before this case, the law allowed states to



Thurgood Marshall

have separate schools for whites and blacks. Marshall convinced the Supreme Court that this practice went against the U.S. Constitution. This ruling helped to end all forms of legalized segregation, or separation, by race.

In 1961 President John F. Kennedy made Marshall a judge. In 1965 President Lyndon B. Johnson made Marshall the U.S. solicitor general. In that job he represented the government in cases before the Supreme Court. Then in 1967 Johnson put Marshall on the Supreme Court.

As a Supreme Court justice, Marshall continued to support equal rights for blacks. He also opposed the death penalty. Marshall retired in 1991. He died in Bethesda, Maryland, on January 24, 1993.

► **More to explore**

African Americans • National Association for the Advancement of Colored People • United States Supreme Court



Marshall Islands

The Republic of the Marshall Islands includes 29 atolls and five islands in the central Pacific Ocean. Atolls are reefs, or chains, of coral that surround a lagoon (a shallow area of water). The country's capital is on Majuro Atoll.

Geography

The Marshall Islands are part of the region known as Oceania. They are scattered over about 770,000 square miles (2,000,000 square kilometers). The atolls and islands are made of coral attached to the tops of underwater volcanoes. The land is low and flat. The climate is hot and humid all year.

Plants and Animals

Palms and breadfruit trees are the Marshall Islands' main plants. Many fish, dolphins, octopuses, and turtles live in the surrounding waters.

People

Most of the people are Micronesians. They speak Marshallese. English is also common. Christianity is the main reli-

gion. More than half of the population lives on Majuro and Kwajalein atolls. The rest of the people live in villages on other islands.

Economy

The economy of the Marshall Islands depends on money received from the United States. Many people work at a U.S. missile-testing area on Kwajalein Atoll. Other people in the cities work for the government or in tourism. On the outer islands, fishing and farming are common. Crops include coconuts and breadfruit.

History

Micronesians arrived on the islands more than 2,000 years ago. John Marshall, a British sea captain, explored the area in 1788. The islands were named after him. Germany took control of the islands in 1886, but Japan seized them in 1914.

During World War II (1939–45) the United States took over the islands. The United States used Bikini and Enewetak atolls to test nuclear weapons. The testing badly damaged the atolls.

The Marshall Islands gained independence from the United States in 1986. However, the U.S. military still protects the country.

► More to explore

Coral • Majuro • Oceania

Facts About MARSHALL ISLANDS

Population
(2008 estimate)
53,200

Area
70 sq mi (181 sq km)

Capital
Majuro

Form of government
Republic

Major towns
Majuro, Ebeye, Laura, Ajeltake, Enewetak



Marsupial

Marsupials are a group of mammals that are known for carrying their young in a pouch. The name marsupial comes from the Latin word *marsupium*, which means “pouch.” Kangaroos, koalas, and opossums are well-known marsupials.

Marsupials live in forests, lakes and streams, grasslands, and even underground. More than 170 species, or kinds, live in Australia, New Guinea, and nearby islands. About 70 species live in South and Central America. One species, the Virginia opossum, lives in North America.

Most marsupials range in size between a small cat and an average-sized dog. But they can be much larger or smaller. The largest marsupial is the red kangaroo of Australia. It can be 10 feet (3 meters) long from its head to the tip of its tail. The smallest marsupials are the mouse-like planigales. They grow to only about 4 inches (10 centimeters) long.

Marsupials are not fully developed at birth. They are tiny and blind. Right after birth they climb up their mother's belly and begin to drink milk from the mother's nipples. In most species the nipples are in a pouch that the young crawl into. The young stay in the pouch



Marsupials have a wide range of body shapes and sizes.

for weeks or months, drinking the mother's milk. Some marsupials do not have pouches. In these species the young simply cling to the mother's nipples.

After the young stop depending on their mother's milk, they can leave the pouch and look after themselves. But they run back to the pouch when danger threatens. The young of the koala and some other marsupials cling to the mother's fur after they have outgrown the pouch.

► More to explore

Kangaroo • Koala • Mammal
• Opossum

Martial Art

Martial arts are fighting skills that people practice for sport or for self-defense. Most of them developed in eastern Asia. The word martial comes from Mars, the ancient Roman god of war. However, most of the martial arts are not violent. Many followers of the religion of Buddhism use martial arts to help achieve spiritual awareness. Other people use martial arts to develop self-



T'ai Chi ch'uan, or T'ai Chi for short, is a slow-moving, graceful type of martial art.

discipline. Martial arts require high levels of both physical and mental training.

Students of the martial arts are commonly ranked according to skill level. They wear colored belts that represent their degree of skill. The darker the color, the higher the rank. The black belt represents the highest skill level.

Martial arts can be divided into armed and unarmed arts. The armed arts use weapons; the unarmed arts do not. In the unarmed arts opponents use their feet and hands to strike or wrestle with each other. In Japan the warriors called samurai were trained in both armed and unarmed arts.

Armed Martial Arts

The armed martial arts historically included archery (shooting arrows with a bow) and fighting with swords or spears. The martial art called ninjutsu used a wide variety of weapons. Ninjutsu is a Japanese word that means "fighting methods of the ninja." The ninja were a secret group of highly trained martial artists. They were spies and fighters for Japanese rulers known as warlords. The ninja used such weapons as blowguns with poisoned darts, brass knuckles, and throwing devices.

In modern times versions of the armed martial arts are practiced as sports. The sport called kendo developed from the fighting methods of the samurai. Opponents in kendo use wooden swords for attack and defense. Kendo means "the way of the sword." Kyudo is a tradi-

tional form of archery that is common in Japan.

Unarmed Martial Arts

Karate is a very popular martial art that started in Japan. The word karate means “empty hand” in Japanese. Karate was probably developed by people who were forbidden to carry weapons. Karate opponents use their arms and legs for punching, kicking, and defending themselves. They try to focus the entire body’s power into the hand, foot, or other body part used for striking. A karate expert can break thick boards with a quick strike from a bare hand or foot.

Tae kwon do is a Korean martial art. The name means “art of kicking and punching.” Tae kwon do blends karate and an earlier form of Korean self-defense. It includes standing kicks, jump kicks, and punches.

Judo is another Japanese martial art. Judo opponents usually do not attack each other directly. Instead they try to turn their opponent’s power to their own advantage. They use quick moves to try to make each other fall. This is called throwing the opponent. They also try to pin each other to the ground. Sometimes they cause the opponent to give up by applying pressure to arm joints or to the neck.

Kung fu is a martial art that began in China. Kung fu means “skill.” Many kung fu movements imitate the fighting styles of animals. There are hundreds of forms of kung fu. Most forms are



Three boys practice karate. Karate is one of the most popular martial arts.

unarmed, but some use swords or other weapons.

T’ai Chi ch’uan is an ancient Chinese martial art similar to kung fu. It is often called T’ai Chi for short. T’ai Chi is a popular form of exercise. The slow, flowing movements used in T’ai Chi can help to reduce stress.

Other unarmed martial arts include aikido, jujitsu, and Thai boxing. Aikido and jujitsu are Japanese. Thai boxing is the national sport of Thailand.

► More to explore

Buddhism • Samurai

Martinique

Martinique is an oval-shaped island in the Caribbean Sea. It is an overseas department (a type of province) of France. Fort-de-France is Martinique’s capital and largest city.



A cathedral, or large church, stands in Fort-de-France, the capital of Martinique.

Geography

Martinique is part of the group of islands called the West Indies. Its nearest neighbors are Dominica, to the north, and Saint Lucia, to the south. The island is mostly mountainous. Short rivers flow down from the island's mountains. Martinique's highest peak is Mount Pelée, an active volcano. Martinique has a warm, humid climate with one rainy season each year. Hurricanes sometimes hit the island.

Plants and Animals

Forests cover almost half of Martinique. Palm, rosewood, white gum, and mahogany trees are common. Ferns and orchids grow in the lowlands. The southern coast has mangrove swamps. Martinique's few animals include mon-gooses, snakes, rabbits, and birds.

People

Most of the people of Martinique have a mixture of black, white, and Asian ancestors. There are small groups of French whites and East Indians. French and a local version of French are the main languages. Most people follow Roman Catholicism. Almost all the people live in cities or towns.

Economy

Tourism is the most important part of Martinique's economy. Factories make petroleum (oil) products, cement, sugar, and rum. The island's main crops are sugarcane and bananas. Martinique also depends heavily on aid from France.

History

Arawak Indians were Martinique's first settlers. The Carib Indians eventually drove the Arawak Indians off the island. Christopher Columbus visited Martinique in 1502. France established a colony on the island in 1635. The French brought people from Africa to work as slaves in the colony's sugarcane fields. Slavery finally ended in 1848.

In 1946 Martinique became a French overseas department. Since then some of the island's people have called for independence. France has responded by giving the island more control over its own affairs. Martinique elects representatives to its own legislature. It also sends representatives to the legislature in France.

► More to explore

Caribbean Sea • France • West Indies

Martyr

A martyr is someone who is willing to die for his or her religious beliefs. Martyrs are important in Christianity, Judaism, and Islam.

The ancient Romans sometimes killed Christians who refused to give up their religion. The apostles Peter and Paul were martyrs of this time. Many Christian martyrs became saints.

Jewish martyrs include members of a family known as the Maccabees, who died long ago in a fight to keep their religion. The Jewish holiday Hanukkah is based on the story of the Maccabees.

Most Muslims agree that there are two groups of martyrs: those killed in jihad, or holy war, and those killed unjustly because of their religion. Every year Shi'ite Muslims remember the death of martyr al-Husayn ibn 'Ali. Husayn was killed in battle in the 600s.

► More to explore

Religion

Mary, Queen of Scots

Mary Stuart became the queen of Scotland when she was a baby. She grew up hoping to be queen of England, too.

Mary was born on December 8, 1542, in Scotland. Her father was King James V of Scotland. When he died only a few days after her birth, she became queen.



Mary, Queen of Scots

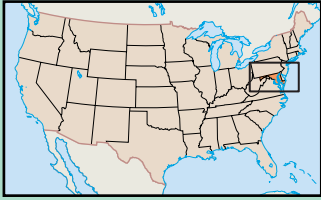
Mary was raised as a Roman Catholic. However, Scotland followed the Protestant branch of Christianity. Many Scots did not want a Catholic queen. Others did not like the advisers she chose or her husband, Henry Stewart, called Lord Darnley.

In 1568 Mary fled her many enemies. Hoping that Queen Elizabeth I would help her, she rushed to England. But Elizabeth did not trust Mary. She knew that Mary had wanted to become queen of England. To protect herself, Elizabeth threw Mary into prison.

Mary remained in prison for the rest of her life. She went on trial in 1586 and was found guilty of plotting to have Elizabeth killed. Mary was beheaded on February 8, 1587.

► More to explore

Elizabeth I • Scotland



Maryland

In the 1630s King Charles I of England gave Lord Baltimore, an English nobleman, the right to set up a colony in America. The new colony was named Maryland in honor of the king's wife, Queen Henrietta Maria (Mary). Maryland is nicknamed the Old Line State. The nickname refers to Maryland's Revolutionary War troops, known as the Maryland Line. The capital of Maryland is Annapolis.

Geography

Maryland is bordered on the north by Pennsylvania. Delaware and the Atlantic Ocean are on Maryland's eastern border. West Virginia is on Maryland's western border. To the south, the Potomac River separates Maryland from West Virginia and Virginia. The District of Columbia is on the Maryland side of the Potomac. The district is surrounded by Maryland on three sides. Within the district is Washington, D.C., the country's capital.

One of Maryland's most notable features is Chesapeake Bay. This large body



Modern and historic buildings line the Inner Harbor in Baltimore, Maryland.

of salt water juts into the state from the south. From east to west Maryland has several different types of landscape. A coastal plain along the water merges into a rolling plateau. To the west of the plateau is a section of the Blue Ridge Mountains. The Appalachian Mountains are located in the far west of the state. The Cumberland Valley lies between the two mountain ranges.

People

Today, whites of European heritage make up about two thirds of Maryland's population. In the 1600s the first Europeans to move to Maryland were mostly from England. German-speaking farmers from Pennsylvania moved to western Maryland during the 1700s. In the 1800s many British, German, Irish, Russian, Polish, Greek, Czech, and Italian people arrived.

Maryland has a significant African American population. African Ameri-



cans now make up more than one fourth of Maryland's residents. After the American Civil War, former slaves from the South moved north to Baltimore. In Baltimore they joined a well-established community of blacks who had been free for several generations. People of Asian heritage and people of Hispanic heritage each represent about 4 percent of the population.

Economy

Food processing is a major manufacturing industry, as is the making of chemical products. Leading products from Maryland's farms are broiler chickens and plant products raised in greenhouses. Farmers also grow soybeans, corn, and wheat. Dairy goods and cattle are important as well. Chesapeake Bay fishermen catch blue crab, a famous Maryland shellfish. The U.S. government is the largest employer in Maryland. Many government employees live in counties near Washington, D.C.

History

Native Americans had villages in the area by AD 1000. Most Indians in Maryland were Susquehanna or Algonquian. By the mid-1700s, the majority of Native Americans had moved farther west.

In the early 1630s, Lord Baltimore began planning an American colony for English Roman Catholics. At the time Catholics faced discrimination in England because of their religion. The colony was started in 1634. In 1649 Maryland passed America's first law regarding religious toleration. The law granted religious freedom to all Christians in the colony.

Many people from Maryland fought in the American Revolution. Following England's defeat, Maryland became the seventh state in the Union on April 28, 1788. In 1791 Maryland provided land to help form the District of Columbia.

Maryland remained part of the Union during the American Civil War. During that period some Marylanders owned slaves. A few Maryland men joined the Southern cause and fought against the Union.

During the 1800s the state had a strong economy and its population grew. The state continued to grow in the 1900s. The population more than doubled in the 50 years from 1950 to 2000.

► More to explore

Annapolis • Washington, D.C.

Facts About MARYLAND

Flag



Population

(2000 census)
5,296,486—
rank, 19th state;
(2008 estimate)
5,633,597—
rank, 19th state

Capital

Annapolis

Area

12,407 sq mi
(32,133 sq km)—
rank, 42nd state

Statehood

April 28, 1788

Motto

*Fatti Maschii,
Parole Femine*
(Manly Deeds,
Womanly Words)

State bird

Baltimore oriole



State flower

Black-eyed Susan



A long scenic bridge crosses Chesapeake Bay near Annapolis, Maryland. Sailboats in the distance compete in a race. Sailing in the bay is a popular recreational activity.

Maseru



Population
(2004
estimate), urban
area, 178,300

Maseru is the capital of Lesotho, a country in southern Africa. It is the country's only large city. It lies on the Caledon River.

Maseru is a center of transportation. A short railway connects the city with South Africa's railroad network. In addition, farmers from the surrounding area sell their crops in the city.

In the 1800s a people called the Sotho took control of what is now Lesotho. The chief of the Sotho, named Moshoe-shoe, founded Maseru in 1869. Great Britain made the area a colony in 1871. Maseru was the colony's capital. In 1966 Lesotho became an independent country with Maseru as its capital. Since then the city has grown rapidly.

► **More to explore**
Lesotho

Massachuset

The Massachuset were Native Americans who lived along the coast of what is now the U.S. state of Massachusetts. The state was named after the tribe.

The Massachuset lived in bark-covered homes called wigwams. Wigwams were large enough for several families. The Massachuset grew corn, beans, and squash. They also fished and hunted deer and other animals.

In 1605 French explorers arrived in Massachuset territory. The tribe welcomed the traders who followed. But many of the Massachuset died from smallpox and other diseases brought by the Europeans.

In 1646 an English pastor named John Eliot came to live with the Massachuset. He convinced many tribe members to become Christians. The Christian Massachuset moved to villages with Christian Indians from other tribes. The Indians in these villages became known as Praying Indians. The most important of the villages was Natick, near Boston.

In 1675 neighboring tribes declared war on English settlers who were taking their lands. This war became known as King Philip's War. During the war neither side trusted the Praying Indians. The English raided the Praying Indians' villages and took some Massachuset captive. They sold some of the captives as slaves.

The surviving Massachuset scattered. Many found homes among other Indian tribes. By the 1800s the Massachuset no longer existed as a separate tribe.

► **More to explore**
King Philip's War • Native Americans

Did You Know?

A Massachuset-language Bible was the first Bible ever printed in what is now the United States. It was completed in 1663.

Massachusetts

The U.S. state of Massachusetts got its name from the region's local Native Americans, the Massachuset tribe. They lived in the Great Blue Hill region in the southeastern part of the state. The Native American words that make up the name Massachuset are thought to mean "at or about the great hill." Massachusetts is nicknamed the Bay State because early settlers made their home along Cape Cod Bay. The state capital is the historic city of Boston.

Geography

Massachusetts is located in the northeastern United States in a region known as New England. The state is bordered on the north by New Hampshire and Vermont. New York is on the western border of Massachusetts. Massachusetts shares its southern border with Connecticut and Rhode Island. The Atlantic Ocean shapes the state's eastern border.

Cape Cod is in the southeastern part of the state. It is a large peninsula that juts into the Atlantic Ocean. Several islands are also part of Massachusetts: Martha's Vineyard, the Elizabeth Islands, and Nantucket.

Massachusetts has several natural regions. It rises from a coastal plain and lowland in the east to a raised, flat plateau region in the center of the state. The Berkshire Hills region is in western Massachusetts.

People

Whites of European heritage account for about four fifths of the state's population. The earliest European settlers in what is now Massachusetts were the English who arrived in the early 1600s. During the mid-1800s the Irish arrived. They fled from Ireland in order to escape the poverty and hunger of the Irish potato famine. Later Italians, Portuguese, Scandinavians, Poles, and others came to the state.

Hispanic Americans now make up the largest minority group in Massachusetts. Puerto Ricans represent about half of the Hispanic population in Massachusetts. African Americans and Asians are the next largest minorities.

Economy

A significant part of the economy in Massachusetts is devoted to the research and development of new technology.





A brook winds through a wooded area of Moore State Park in Massachusetts.

Many high-technology companies are located in the Boston area.

Service industries such as education and tourism are also important to the economy. Massachusetts is famous for its excellent colleges and universities. These include the Massachusetts Institute of Technology, Tufts University, and Harvard University. The state's many schools employ a large number of people as teachers and administrators. Tourism businesses such as hotels and restaurants also employ many people in Massachusetts. Popular tourist areas include Boston, the Cape Cod region, and the Berkshires.

The state's manufacturing businesses make industrial machinery, electronic equipment, medical supplies, and computer parts. Because of the state's poor

soil conditions, farming has never been central to the economy.

History

Native Americans had been living in the Massachusetts area for thousands of years before Europeans arrived. In 1620 the first European settlers landed at Plymouth on a ship named the *Mayflower*. These settlers, called Pilgrims, were people who had broken away from the Church of England to form a separate church. They established Plymouth Colony. Another group called the Puritans later established the larger Massachusetts Bay Colony to the north. In 1691 the Plymouth Colony became part of the Massachusetts Bay Colony.

During the 1700s Massachusetts became known as a trading center. As wealth

increased, so did the desire for self-government. Colonists resented all of the taxes Britain made them pay. A series of events led Britain and the colonists to war. In 1770 British soldiers and an angry mob clashed in an event known as the Boston Massacre. In 1773 some colonists dumped British tea into Boston Harbor to protest the tea tax. This act was known as the Boston Tea Party.

In April 1775 the “shot heard round the world” was fired at Concord to start the American Revolution. Massachusetts was the site of many conflicts in this war, including the battle of Bunker Hill. Britain was defeated and the colonies became independent in 1783. In 1788 Massachusetts became the sixth state to approve the U.S. Constitution.

The state’s economy declined after the American Revolution. It continued to struggle until after the War of 1812, when textile mills and factories were opened in Lowell. The opening of new



Cape Cod is a popular destination for tourists in the summertime.

factories brought jobs to thousands of workers. As a result of this new type of business activity, Massachusetts became the North American center of the Industrial Revolution. The state also became a center for literature, the arts, sciences, and social-reform movements.

Massachusetts was strongly against slavery. As a result, it fought on the side of the Union during the American Civil War (1861–65).

In the 1900s the state’s economy went through a number of changes. The textile and shoe industries left the state, causing years of economic decline. The economy improved when the electronics and communications industries emerged after World War II. In the late 20th century Massachusetts became a leader of the high-technology industry. This revived the state’s economy.

► More to explore

American Revolution • Boston
• Industrial Revolution • Puritans

Facts About MASSACHUSETTS

Flag



Population

(2000 census)
6,349,097—
rank, 13th state;
(2008 estimate)
6,497,967—
rank, 15th state

Capital

Boston

Area

10,555 sq mi
(27,336 sq km)—
rank, 44th state

Statehood

February 6, 1788

Motto

*Ense Petit
Placidam Sub
Libertate Quietem*
(By the Sword We
Seek Peace, but
Peace Only
Under Liberty)

State bird

Black-capped
chickadee



State flower

Mayflower



Students sit on the grass on the campus of Harvard University, in Cambridge, Massachusetts. It is one of the top universities in the United States. It is also the country’s oldest school of higher learning.

Massachusetts Bay Colony

In 1630 a group of people called Puritans left England for North America. The settlement they started in America was called the Massachusetts Bay Colony.

The Puritans were a group of Protestant Christians with strict religious beliefs. They disagreed with some practices of England's official church, the Church of England. The English government mistreated them because of their beliefs. The Puritans wanted to find a place where they could practice their religion in peace. In 1629 King Charles I of England gave a group of Puritans permission to trade and settle in America.

The group was called the Massachusetts Bay Company.

The Massachusetts Bay Company sent more than 1,000 Puritans across the Atlantic Ocean in 1630. They were the first settlers of the Massachusetts Bay Colony. Their leader was John Winthrop. They set up their own government and started several towns. Boston was the most important town.

The Puritans did not allow people who disagreed with their religious beliefs to live in the colony. Roger Williams was one of the people who was forced to leave. He then founded the colony of Rhode Island.

Trouble gradually built up between England and the Massachusetts Bay Colony. The king had not wanted the

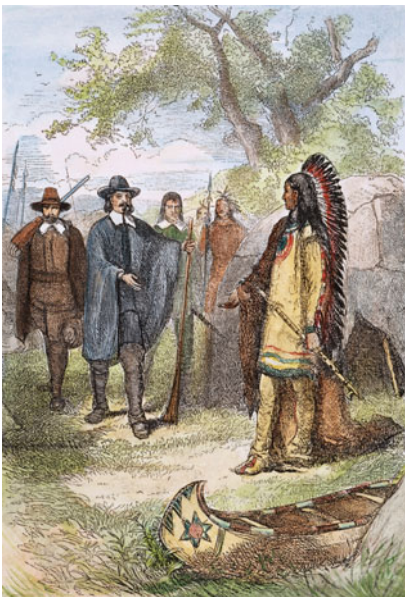


colonists to govern themselves. In 1684 King Charles II put the Massachusetts Bay Company out of business. In 1691 England created a new Massachusetts Bay Colony by combining the old colony with Plymouth Colony and other lands. The new colony was controlled by the English government.

► More to explore

Boston • Colony • Plymouth Colony
• Puritans

Massasoit



An illustration shows an English colonist visiting with Chief Massasoit in 1621.

Massasoit was a chief of the Wampanoag in the 1600s. The Wampanoag were Native Americans who lived in what is now Massachusetts and Rhode Island. Massasoit is remembered for keeping peace with the Pilgrims, a group of English settlers who set up a colony on his tribe's land.

Massasoit was born in about 1590. In 1620 the Pilgrims arrived from England and started Plymouth Colony. By that time Massasoit was a chief. In 1621 he visited Plymouth. He was friendly to the Pilgrims and signed a peace treaty with them. He encouraged his people to show the colonists how to farm, fish, and hunt. To thank Massasoit, the English invited him and other Wampanoag to a great feast. The event is now celebrated as the first Thanksgiving.

Massasoit kept the peace until he died in 1661. But tension had started to build up because some colonists refused to follow his treaty. They took more and more Indian land. In 1675 Massasoit's son Metacom (called King Philip by the English) tried to drive out the colonists. This led to a war called King Philip's War. The war was a disaster for the Wampanoag. The tribe was defeated, and most of its people were killed.

► More to explore

Metacom • Wampanoag

Mastodon and Mammoth

Mastodons and mammoths were elephantlike animals that roamed Earth in large numbers thousands of years ago. These animals later became extinct.

Where and When Mastodons and Mammoths Lived

Mastodons were early relatives of mammoths. They first dominated Earth

Did You Know?

Early Native Americans hunted both mammoths and mastodons.

American mastodon

woolly mammoth

African savanna elephant



Mastodons were smaller than mammoths and modern elephants. Both mastodons and mammoths had more hair than modern elephants.

about 25 million years ago. Mastodons lived all over the world.

Mammoth remains have been found on every continent except Australia and South America. The animals lived sometime between 1,800,000 and about 10,000 years ago.

Physical Features

Mastodons were shorter than modern elephants but were more heavily built. The legs were short, massive, and like pillars. Mastodons were covered with long, reddish brown hair.

In comparison, most of the mammoth species, or types, were about as large as modern elephants. They were about 10 to 13 feet (3 to 4 meters) tall. Mammoths had a woolly, yellowish brown undercoat about 1 inch (2.5 centimeters) thick.

Study of Fossils

The bodies of many mammoths and mastodons have survived for thousands of years because they were trapped in

ice. These frozen remains were eventually discovered by humans and used for study. Early humans also made paintings of some of the animals on the walls of caves in Europe. The paintings provide more clues about these wild beasts.

Extinction

Scientists are not sure why mastodons and mammoths died out. It may have been because of a change in the weather where they lived. Experts think that as the weather got colder, thick ice sheets covered vast areas of land. This destroyed the grasslands on which the animals lived and fed.

Mathematics

Mathematics, or math, is the study of numbers and how they are related to each other and to the real world. Math is as important as language. In fact, people sometimes describe math as a kind of language. Everyone uses math every day—to tell time, to play games, to

cook, to build things, and to do almost any kind of work.

Types of Mathematics

There are many branches of mathematics. Some of the main ones are arithmetic, algebra, geometry, trigonometry, calculus, statistics, and probability.

Mathematics also may be divided into two general areas: pure and applied. Pure math is the study of math for its own sake. Applied math is the study of math for the purpose of solving real-life problems. People use applied math to build skyscrapers, make computers, predict earthquakes, explain how the economy works, and many other things.

History

People have used mathematics since ancient times. The Egyptians could not



Workers look at the plans for a building. The use of mathematics to construct buildings is an example of applied math.

have built the pyramids without a very good understanding of math, especially arithmetic and geometry. The Babylonians of ancient Mesopotamia (now in Iraq) invented a complex number system and used fractions.

The ancient Greeks greatly expanded math with many new ideas. In about 300 BC the Greek mathematician Euclid wrote an important book on geometry called *Elements*. Later, the Arabs also contributed greatly to math. In the AD 800s an Arab mathematician named al-Khwarizmi described a problem-solving system that is now known as algebra.

The ancient Greek and Arab ideas about math eventually spread to western Europe. Math progressed as European scientists used it to research other subjects. In the 1600s the astronomer Johannes Kepler used new mathematical ideas to study the skies. Other scientists in the 1600s, namely Galileo and Isaac



Children study different types of mathematics at school. One of the first types they learn is basic arithmetic—adding, subtracting, multiplying, and dividing.

Newton, applied math to the study of motion. In the 1800s and 1900s scholars developed many new ways to study and use math.

► More to explore

Arithmetic • Geometry • Numbers and Number Systems • Statistics

Matter

Anything that takes up space is called matter. Air, water, rocks, and even people are examples of matter. Different types of matter can be described by their mass. The mass of an object is the amount of material that makes up the object. A bowling ball, for example, has more mass than a beach ball.

States of Matter

Matter exists in several different forms, called states. The three most familiar states are solid, liquid, and gas.

Rocks, books, desks, and balls are examples of solids. Matter in the solid state has a set size and shape. A solid's size and shape do not change easily. For example, when a person moves a book

from a smaller to a bigger box, the book looks the same.

Milk and water are examples of liquids. In the liquid state, matter has a set size, or amount. However, its shape depends on its container. For example, milk changes shape when a person pours it from a carton into a glass. But the amount of milk stays the same.

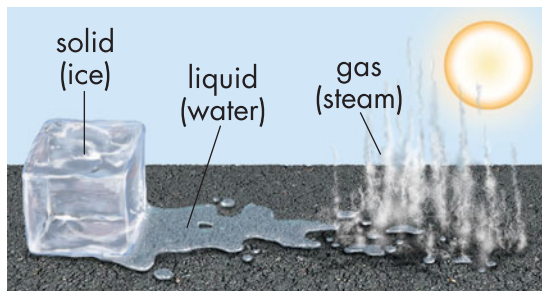
The air and the helium used to fill balloons are examples of gases. Matter in the gaseous state does not have either a set size or a set shape. It can expand to fill a large container, or it can be squeezed into a smaller container.

Matter can change from one state to another. For example, heat causes ice (solid water) to melt into a liquid. Heat also causes liquid water to evaporate, or turn into water vapor—a gas.

Properties of Matter

All matter has physical properties. A physical property is one that a person can measure without changing the matter. Color, amount, and temperature are examples of physical properties.

All matter also has chemical properties. A chemical property tells how matter will change under special conditions. For example, certain metals turn to rust if they sit out in the rain. Paper and wood burn to ashes if they touch a flame. Burning and rusting are called chemical reactions. Chemical reactions change matter into new types of matter.



The three most familiar states of matter are solid, liquid, and gas. Water exists in all three states.

Mauritania

Mauritania, a country in West Africa, lies in the huge desert called the Sahara. Its capital is Nouakchott.

Geography

Mauritania shares borders with Western Sahara, Algeria, Mali, and Senegal. The Senegal River forms part of the southern border. The Atlantic Ocean is to the west. Most of the land is flat. Sand dunes cover about half of the country.

Plants and Animals

The northern part of Mauritania is a desert with few plants. The savanna, or grassland, in the south has baobab and palm trees. Lions, elephants, ostriches, and panthers live on the savanna.

People

Most of the people are Moors. These are the descendants of Arabs and Berbers (the original inhabitants of North Africa). Black Africans make up the rest of the population. The main language is



A woman paints the wall of her house in Mauritania.

Arabic. Islam is the national religion. More than half of the people live in cities or towns. But many people follow a nomadic (wandering) lifestyle.

Economy

Mining, fishing, and farming are important parts of Mauritania's economy. Iron ore and fish are valuable exports. In the early 21st century Mauritania also started to export oil. Many of Mauritania's people raise sheep, goats, cattle, or camels. Rice, millet, sorghum, beans, and dates are major crops.

History

The first people in what is now Mauritania were black African and Berber peoples. Arab tribes moved into the area in the 1400s. France set up settlements in the 1800s. In 1920 the area became a French colony. Mauritania gained independence in 1960.



Facts About MAURITANIA



Population
(2008 estimate)
3,204,000

Area
398,000 sq mi
(1,030,700 sq km)

Capital
Nouakchott

Form of government
Republic

Major cities
Nouakchott,
Nouadhibou,
Rosso, Boghé,
Adel Bagrou



Mauritius

Mauritius is a small island country off the southeast coast of Africa. Mauritius' capital is Port Louis.

Geography

Mauritius lies in the Indian Ocean about 500 miles (800 kilometers) east of Madagascar. The country includes the large island called Mauritius as well as several smaller islands.

Plants and Animals

Most of Mauritius' forests were cut down to make room for sugar plantations. Its remaining plants include bamboo, coconut palms, and ebony trees. The country's unique wildlife includes the sambar (a long-tailed deer) and the tenrec (a spiny mammal). A large bird called the dodo once lived in Mauritius, but the last dodo died before 1681.



Farmland and low mountains are common sights in Mauritius.

People

Most Mauritians have roots in southern Asia. About a quarter of the people are Creoles. Creoles have a mixture of white, Asian, and African roots. English and Creole are the main languages. People follow Hinduism, Christianity, or Islam.

Economy

Tourism and banking are important to the economy. Factories make clothing and sugar. Crops include sugarcane, bananas, and vegetables.

History

In 1598 the Dutch arrived on the island. They named it Mauritius after Maurice of Nassau, the governor of the Netherlands. In 1715 France took control. In 1810 Great Britain seized the island. Mauritius gained independence in 1968.

► More to explore

Indian Ocean • Port Louis

Facts About MAURITIUS



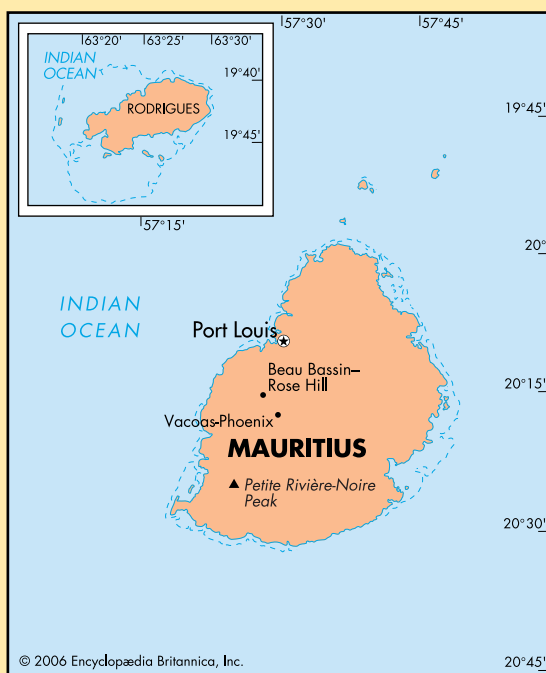
Population
(2008 estimate)
1,269,000

Area
788 sq mi (2,040 sq km)

Capital
Port Louis

Form of government
Republic

Major urban areas
Port Louis, Beau Bassin-Rose Hill, Vacoas-Phoenix, Curepipe, Quatre Bornes



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Mauryan Empire

Before 321 BC the region of India contained many small kingdoms and territories. But with the beginning of the Mauryan Empire that year, many of those small parts came under one ruler.

At one point the Mauryan Empire stretched from the Himalayas in the northeast to what is now Afghanistan in the northwest. It also reached south, almost to the tip of India. This unity of territory brought progress in many areas of Indian life, including art, trade, and politics.

The first leader of the empire was Candragupta. He founded the Maurya dynasty, or ruling family, in 321 BC. To expand his territory, Candragupta conquered many surrounding lands. His son Bindusara, who took the throne in 297 BC, conquered more lands to the south.



The region around Bodhi Gaya, India, was once a part of the Mauryan Empire. In the 200s BC the Mauryan emperor Asoka built a shrine where a large Buddhist temple now stands.

Asoka, Bindusara's son, is the best known of the Mauryan emperors. After becoming a Buddhist, Asoka began writing about his new religion. Much of this work included rules that he expected his people to follow. People carved many of Asoka's Buddhist rules on pillars and rocks and in caves. Asoka's religious influence was so great that he is one of the most famous rulers in Indian history.

The land of the Mauryan Empire was divided into four provinces, or states. These were further divided into districts and villages. A prince of the royal family governed each province.

Mauryan society was divided into seven groups, or castes. These included philosophers, farmers, soldiers, herdsmen, artisans, judges, and councillors. Monks, priests, and teachers belonged to the philosopher caste.

A military commander assassinated the last Mauryan emperor, Brhadratha, in 185 BC. The commander founded his own dynasty, and the Mauryan Empire ended.

► More to explore

Buddhism • Caste • India

Maya

The Maya are Native Americans of Mexico and Central America. Between about AD 250 and 900 the Maya had a way of life that was very advanced for the time. The Mayan civilization began a fast decline after 900. No one knows for sure why this happened.

Did You Know?

After the Mauryan Empire ended, the Shunga dynasty ruled in central India for about a century.



Mayan buildings still stand in the ancient city of Chichén Itzá in Mexico.

How the Maya Lived

The Maya lived first in villages and later in cities. Their cities had large temples, stone pyramids, palaces, and ball courts. The Maya created farmland by cutting away the trees and vines of the surrounding rain forest. They grew corn, beans, and squash.

The Maya created a writing system called hieroglyphics, which used pictures instead of words. They also studied the planets and the stars. They used their observations of the heavens to make a very accurate calendar. The Maya also developed a system of mathematics.

The Maya worshipped a number of nature gods. These included gods of the sun, the moon, rain, and corn. In religious ceremonies, the Maya killed people they had captured during battle. They thought that the gods needed human blood for nourishment.

History

The Maya lived in villages by about 1500 BC. By AD 200 they were living in cities. By 900 they had built more than 40 cities. Some of the most important cities were Tikal, Palenque, Copán, and Bonampak. Today these cities are found in Guatemala, Honduras, and southern Mexico.

After 900 the number of Maya fell. They abandoned many of their cities. War may have been one of the causes of this decline. In the early 1500s the Spanish arrived in Mayan territory. The Spanish forced the Maya to work for them. Many Maya died from diseases that the Spanish brought with them. Today descendants of the Maya live in Mexico, Guatemala, and Belize.

► More to explore

Calendar • Native Americans

May Day

May Day is a spring holiday celebrated on May 1. Many people celebrate May Day with festivals or flowers. One of the



Schoolchildren celebrate May Day with a traditional maypole.

oldest May Day traditions is the maypole. A maypole is a tree trunk or pole decorated with colorful ribbons. On May Day dancers hold the ribbons and dance around the pole. In some countries May Day is a holiday that honors workers, similar to Labor Day. May Day is not an official holiday in the United States.

May Day began as a spring festival in Europe. In ancient times and during the Middle Ages (AD 500–1500) Europeans welcomed the end of winter. With the arrival of spring, they were able to grow crops again. They celebrated with eating, singing, and dancing. The tradition of May Day as a workers' holiday began in the late 1800s.

► More to explore

Labor Day

Mayflower

In 1620 a ship called the *Mayflower* carried a group of English people across the Atlantic Ocean to North America. These people set up the first permanent European colony in New England at what is now Plymouth, Massachusetts. Later they became known as the Pilgrims.

Background

The Pilgrims were Separatists, or people who had separated from the Church of England. They were looking for the freedom to practice their own strict form of Protestant Christianity, known as Puritanism.



An illustration shows the *Mayflower* sailing across the Atlantic Ocean to North America.

A group of English Separatists settled in Holland (now The Netherlands) in 1608. They had religious freedom there, but they did not feel at home. They decided to go to North America, where they could keep their English ways.

The Separatists first returned to England on a small ship called the *Speedwell*. Then they got the *Mayflower* in a deal with some merchants. People hired by the merchants also traveled on the *Mayflower*. They outnumbered the Separatists.

Voyage

The *Mayflower* set sail from Plymouth, England, in September of 1620. The captain was Christopher Jones. With more than 100 passengers, the ship was overcrowded. The sanitary conditions were terrible. Many suffered from seasickness. After 66 days, the *Mayflower*

Did You Know?

It is believed that the *Mayflower* made a few voyages after returning to England and was then broken apart and sold for wood.

landed on Cape Cod, in what is now Massachusetts, on November 21, 1620.

Arrival

While still aboard ship, the travelers prepared an agreement called the Mayflower Compact. In it they agreed to govern themselves with “just & equal laws.” All the adult males on the ship, including the non-Separatists, signed the compact.

The travelers stayed on the ship until the leaders decided where to settle. Finally in December they chose a place, which they named Plymouth. The *Mayflower* remained nearby throughout the first winter. People stayed on it until they built houses. The ship went back to England in the spring of 1621.

► More to explore

Plymouth Colony • Puritans

Mays, Willie

Willie Mays was a great baseball player known for both his batting and his fielding. He ranks among the all-time leaders in home runs, hits, runs scored, and runs batted in (RBI).

Willie Howard Mays was born on May 6, 1931, in Westfield, Alabama. In 1948 he joined the Birmingham Black Barons of the Negro National League. He was still in high school.

In 1950 Mays graduated and signed a contract with the New York Giants of the National League. He played two seasons in the minor leagues before join-



Baseball player Willie Mays hits a home run in 1964.

ing the Giants at the major league level. Mays was named rookie of the year for the 1951 season.

Mays missed almost all of the 1952 and 1953 seasons while serving in the U.S. Army. He returned to baseball in 1954 and became a star. He played for the Giants in New York and, from 1958 to 1972, in San Francisco. Mays led the league in home runs four times. He also led in stolen bases four times. As a center fielder he won 12 Gold Glove awards for outstanding defensive play. Mays played in 24 straight All-Star games.

In 1973 Mays finished his career back in New York as a member of the Mets. He retired with 660 home runs, 3,283 hits, 2,062 runs scored, and 1,903 RBI. Mays was elected to the Baseball Hall of Fame in 1979.

► More to explore

Baseball

Mbabane



Population
(2006 estimate)
78,700

Swaziland, a country in southern Africa, has two main capitals—Mbabane and Lobamba. Most of Swaziland's government offices and its High Court are in Mbabane. The country's lawmakers meet in Lobamba.

Mbabane is among the larger cities in Swaziland. It lies on the Mbabane River within a hilly region. The city is a center of government and business. The main tourist center in Swaziland lies just outside Mbabane.

Mbabane developed in the late 1800s around the place where the Swazi king kept his cattle. Great Britain took control of Swaziland in the early 1900s. The

British made Mbabane the capital of Swaziland. In 1968 Swaziland became an independent country. Mbabane remained the center for much of the country's government.

► More to explore

Swaziland

McKinley, Mount



Mount McKinley is the highest mountain in North America. It rises to a height of 20,320 feet (6,194 meters). It is located near the center of the Alaska Range in south-central Alaska. The mountain has two peaks, the southern peak being the higher. The upper two thirds of the summit is covered year-round with snow and huge glaciers.

The Athapaskan Indians who lived in the region called the mountain Denali, meaning "the high one." In 1889 it was named Densmores Peak after Frank Densmore, an explorer. The mountain was renamed Mount McKinley in 1896



A market in Mbabane overflows with local crafts and artwork.



Mount McKinley rises high above Denali National Park in Alaska.

to honor William McKinley, who was elected president of the United States later that year. Climbers first reached the northern peak in 1910 and the southern peak in 1913. Mount McKinley is part of Denali National Park and Preserve.

► More to explore

Alaska • Glacier • Mountain

McKinley, William

The 25th president, William McKinley helped make the United States into a world power. After a war with Spain, the United States controlled an empire stretching from the Caribbean Sea to the Far East.

Early Life

William McKinley was born on January 29, 1843, in Niles, Ohio. He attended college for a few months, taught school, and worked in a post office. During 1861–65 McKinley fought in the American Civil War.

After the war McKinley studied law. McKinley married Ida Saxton in 1871. The couple had two children, but they both died.

Political Career

In 1876 McKinley was elected to the U.S. House of Representatives. He served for six terms. From 1892 to 1896 McKinley was the governor of Ohio.

In 1896 the Republican Party chose McKinley to run for president. After defeating his opponent, William Jennings Bryan, McKinley became president on March 4, 1897.

Presidency

During McKinley's presidency many people wanted the United States to help Cuba gain independence from Spain. Congress declared war in April 1898. The United States easily defeated the Spanish forces in a few months. The



William McKinley was the 25th president of the United States.



TIMELINE

McKinley is born in Niles, Ohio.

January 29, 1843

McKinley becomes governor of Ohio.

1892

McKinley is elected to the U.S. House of Representatives.

1876

McKinley is elected president.

1896

Congress declares war on Spain.

April 25, 1898

McKinley is reelected.

1900

McKinley is killed; Theodore Roosevelt becomes president.

1901

Spanish-American War ended with a treaty that gave Puerto Rico, Guam, and the Philippines to the United States. Cuba became independent.

The successful war and a good economy made McKinley very popular. He won reelection in 1900. Theodore Roosevelt became vice president. (McKinley's first vice president, Garret A. Hobart, had died.) During McKinley's second term, he proposed trade agreements with other countries to lower the taxes charged on each other's goods.

Assassination

In 1901 McKinley attended the Pan-American Exposition in Buffalo, New York. While the president was meeting with the public, a man in the crowd shot him in the chest and stomach. The shooter was an anarchist—a person who believes that all government is unnecessary. McKinley was rushed to a nearby hospital, but doctors could not save

him. The president died eight days later, on September 14, 1901.

► More to explore

Roosevelt, Theodore • Spanish-American War • United States

Measles

Measles is a disease that is caused by a germ called a virus. Children get measles most often, but adults can get it, too. Adults tend to have more severe cases.

Measles spreads very easily from person to person. When a person with measles coughs or sneezes, the virus spreads into the air. People who breathe in the virus are infected.

The first symptoms, or signs, of measles appear about 10 days after a person is infected with the virus. At first measles is like a severe cold. The infected person



Before the late 1960s, nearly every child got measles.

has a runny nose, a fever, and red, watery eyes. Then bluish white spots appear on the insides of the cheeks. The fever gets higher, and a red rash appears on the face and behind the ears. The rash then spreads to the rest of the body.

Measles usually goes away after a few days. In some people, however, it can lead to more serious health problems. These include pneumonia and encephalitis, or swelling of the brain.

There is no drug to fight measles. A person with the disease must get plenty of rest and drink a lot of fluids. People can prevent measles by getting a shot of a substance called a vaccine. The vaccine protects the body from the measles virus.

► More to explore

Vaccine • Virus

Measurement

Length, volume, and weight are examples of measurements. People use measurements every day at home, at work, and in school.

In order to be accurate, all measurements must make a comparison with something called a standard. A standard is a quantity, or amount, that everyone agrees on. For example, everyone agrees that 1 pound is a certain amount of weight. So, 2 pounds equal twice that amount, 3 pounds equal three times that amount, and so on. There are different standards for measuring length, volume, area, and many other things.

Units are the names used for different standards. For example, a pound is a



A cylinder that weighs exactly 1 kilogram is kept by the International Bureau of Weights and Measures in Paris, France. The kilogram is a unit of weight in the metric system of measurement.

unit of weight. Units may also be divided into smaller units. For example, a foot is a unit of length that may be divided into 12 smaller units, called inches. Measuring instruments, such as scales and rulers, are marked with these units.

All standards belong to a particular system of measurement. Throughout history, people have come up with many systems of measurement. Each system has its own set of standards. That is, each has a different way of measuring. Pounds and kilograms are both units of weight, but each belongs to a different system. Therefore a box that weighs 2.2 pounds in one system weighs 1 kilogram in another. The two most widely used systems are the English system and the metric system.

English System

The system of measurement most commonly used in the United States is based on the English system. This

Some Basic Measures in the U.S. Measurement System	
Length	
12 inches = 1 foot	
3 feet = 1 yard	
5,280 feet = 1 mile	
Weight	
16 ounces = 1 pound	
2,000 pounds = 1 ton	
Liquid Volume	
16 fluid ounces = 1 pint	
2 pints = 1 quart	
4 quarts = 1 gallon	
Area	
640 acres = 1 square mile	
Cooking	
3 teaspoons = 1 tablespoon	
2 tablespoons = 1 fluid ounce	
8 fluid ounces = 1 cup	

system developed in England, and English settlers brought it to the American colonies.

In this system the inch is a unit of length. There are 12 inches in 1 foot and 5,280 feet in 1 mile. The cup is a unit of volume (used to measure liquids). There

Some Metric Prefixes			
Prefix	Name	Equal to	Examples
mega	million	1,000,000	One megabyte equals one million bytes. (A byte is a unit of measurement for computer storage space.)
kilo	thousand	1,000	One kiloliter is equal to one thousand liters.
hecto	hundred	100	One hectogram is equal to one hundred grams.
deka (also spelled deca)	ten	10	One decameter is equal to ten meters.
deci	tenth	0.1	One deciliter is equal to one tenth of a liter.
centi	hundredth	0.01	One centimeter is equal to one hundredth of a meter.
milli	thousandth	0.001	One millisecond is equal to one thousandth of a second.
micro	millionth	0.000001	One microgram is equal to one millionth of a gram.
Note: To convert from one metric measurement to another, simply move the decimal point in the measurement being converted. For example, to convert millimeters to centimeters, move the decimal point over one place to the left. 27 millimeters is equal to 2.7 centimeters. To convert kilograms to decigrams, move the decimal point four places to the right. 3.3 kilograms is equal to 33,000 decigrams.			

Some Conversions Between U.S. and Metric Measurements	
<i>Length</i>	
1 inch = 2.54 centimeters	
1 foot = 0.3048 meter	
1 mile = 1.6093 kilometers	
1 centimeter = 0.3937 inch	
1 meter = 3.2808 feet	
1 kilometer = 0.62137 mile	
<i>Liquid Volume</i>	
1 quart = 0.9463 liter	
1 gallon = 3.785 liters	
1 liter = 1.0567 quarts	
1 liter = 0.2642 gallon	
<i>Weight</i>	
1 pound = 0.45359 kilogram	
1 kilogram = 2.2046 pounds	

are 2 cups in 1 pint, 2 pints in 1 quart, and 4 quarts in 1 gallon. The ounce is a unit of weight. There are 16 ounces in 1 pound and 2,000 pounds in 1 ton.

Many of the names for these units come from the fact that, at first, people used everyday objects to measure things. The length of a person's foot was used to measure short distances. A household cup might be used to measure liquids. But without standards, these measurements were not the same for everyone. Eventually people set standards, and the English system became the first world-wide system of measurement.

Metric System

In the 1790s France developed the metric system of measurement. By the middle of the 1900s most countries had adopted this system. In the metric sys-

tem, each kind of measurement has one basic unit. The meter is the basic unit of length, the gram is the unit of weight, and the liter is the unit of volume. Each unit is divided into smaller units or combined into larger units by multiples of 10.

Standard prefixes, or parts of words, are added to the beginning of the basic unit to tell how many multiples of 10 are in a unit. For example, "kilo-" means "thousand" so there are 1,000 meters in 1 kilometer. And "centi-" means " $\frac{1}{100}$ " so 1 meter is equal to 100 centimeters.

Mecca



Population
(2007
estimate), urban
area,
1,385,000

Mecca is a city in Saudi Arabia, a country in the Middle East. The city was the birthplace of Muhammad, the founder of Islam. Muslims all over the world turn toward Mecca to pray five times each day. It is the world's holiest city to Muslims. Because of that, only Muslims are allowed to enter Mecca.

Every Muslim who is able to must make a religious journey, or pilgrimage, to Mecca at least once. The pilgrims visit the Great Mosque. In the mosque's courtyard is the holy Ka'bah, a small

Medici Family

The Medici were a wealthy and powerful family of Italian bankers and merchants. Their power was at its height in the 1400s and 1500s, when they ruled the city of Florence, Italy. They eventually ruled the surrounding region of Tuscany, too.

The Medici held important positions in Florence's government. They also were the bankers of the pope, the leader of Roman Catholicism. Several popes came from the Medici family. Two Medici women—Catherine de Médicis and Marie de Médicis—became queens of France.

The Medici used their vast wealth to keep their political power. They also spent their money on architecture and the arts. Some of the world's greatest buildings, statues, and paintings once belonged to the Medici.

Hundreds of thousands of pilgrims gather at the Great Mosque in Mecca.

building that contains the Black Stone of Mecca. Legend says that the stone was given to Adam, the first man, when he was forced to leave paradise. Pilgrims walk around the Ka'bah seven times. They also touch or kiss the Black Stone.

The millions of pilgrims who visit Mecca each year are important to the city's economy. Many city residents work at jobs providing food, housing, and other services to the pilgrims.

In ancient times Mecca lay on a major trade route. Muhammad was born in the city in about AD 570. He was forced to leave in 622, but he returned in 630 and took control of the city. He declared Mecca a place of Muslim pilgrimage.

Mecca was part of the Turkish Ottoman Empire for hundreds of years, from 1517 to 1918. A little later the city became part of Saudi Arabia.

► More to explore

Islam • Muhammad • Pilgrimage
• Saudi Arabia



Several paintings by the famous artist Peter Paul Rubens show events from the life of Marie de Médicis. Marie was a member of the Medici family who became queen of France.

Did You Know?

Three children of Catherine de Médicis and the French king Henry II also became kings of France—Francis II, Charles IX, and Henry III.

Cosimo de' Medici

Born in 1389, Cosimo de' Medici was the first Medici to gain power in Florence. He helped to bring the ideas of ancient Greece to Florence. These Greek ideas became popular and helped to fuel the Renaissance, an important period for the arts and sciences. Cosimo also collected works by important artists, including Donatello and Fra Angelico. Cosimo died in 1464.

Lorenzo de' Medici

Lorenzo de' Medici was born in 1449. As his power grew, he became known as Lorenzo the Magnificent. Lorenzo's daughter married a son of Pope Innocent VIII. (The son was born before Innocent became a priest.) This marriage gave the Medici almost complete control over Florence and Rome.

Lorenzo founded an academy for artists in Florence. He supported the artists Michelangelo and Leonardo da Vinci. Lorenzo was also a poet. He added hundreds of works to the family library. Lorenzo died in 1492.

Pope Leo X

Lorenzo's son Giovanni was born in 1475. In 1513 he was elected pope. He took the name Leo X.

Pope Leo brought in artists and architects to work on the Vatican Palace (the pope's home) and Saint Peter's Basilica (a huge church) in Rome. Among the artists Leo hired were Raphael and Michelangelo. Leo died in 1521.

The Last Medici

Over time the power of the Medici weakened. In 1743 Cosimo de' Medici's great-great-great-granddaughter, Anna Maria Luisa, died. She was the last of the family. Her will gave the Medici art collection to Florence and Tuscany. Many of the Medici treasures remain in Florence for all to see.

► More to explore

Italy • Pope • Renaissance

Medicine

Medicine is the science of keeping people healthy and healing the sick. Humans have practiced forms of medicine for thousands of years. Today specially trained people called physicians, or doctors, practice medicine.

Doctors

There are many parts to a doctor's job. Doctors first need to identify what is



Young children need frequent check-ups to make sure that they are healthy and growing well. Doctors who specialize in treating children are called pediatricians.

making a person sick. Then they decide on a treatment. They also predict when the patient will feel better. In addition, doctors try to prevent illnesses. When treating patients, doctors work with many other people, including nurses, therapists, and physician assistants.

Becoming a doctor involves years of education and training. Medical students first graduate from college. Then they spend three to four years in medical school. Students usually earn a Doctor of Medicine degree in medical school. After medical school, most graduates enter a residency, which is a training program usually in a hospital. During a residency, experienced doctors train the new doctors for three to seven years. During this time, new doctors can specialize in a particular type of medicine in such areas as internal medicine or surgery. Finally, new doctors must pass a test to get a license to practice medicine.

History

The ancient Greek doctor Hippocrates is considered the Father of Medicine. He treated medicine as a science. He made detailed observations of his patients and thought that diseases had a physical cause. Before that people had thought that diseases were caused by the gods or evil spirits. Another important ancient doctor was Galen of Pergamum, in the Roman Empire. He wrote many works about the human body.

In about AD 1000 a doctor from Iran named Avicenna wrote an important medical book. Doctors in the Middle



Two surgeons look at X-rays of a patient's body. Surgeons are doctors who perform surgery, or operations.

East and Europe followed the teachings of this book for centuries.

From the 1500s to the 1700s Europeans used science to make many medical discoveries. By the late 1700s an English doctor discovered vaccines. These are substances that can prevent disease.

Doctors in the 1800s began to use stethoscopes, X-rays, and many other helpful devices. They learned how germs cause disease. They also learned that cleaning hands and medical instruments helps to kill germs.

In the 1900s scientists developed vaccines to prevent many diseases and drugs to treat many others. Doctors transplanted organs from one person into another. They used many machines to help them to identify and treat diseases. They also learned how good nutrition helps people to stay healthy.

Today doctors have many ways to help patients heal. But there are still many

unanswered questions in medicine. For example, scientists are still searching for cures for cancer, AIDS, and many other diseases.

► More to explore

Disease, Human • Drug • Hospital
• Nursing • Surgery • Transplant
• Vaccine • X-rays

Mediterranean Sea



The Mediterranean is a large sea that separates Europe from Africa. It stretches from the Atlantic Ocean in the west to Asia in the east. Many early civilizations developed in the Mediterranean region.

Geography

The Mediterranean Sea covers about 970,000 square miles (2,510,000 square kilometers). In the west a narrow waterway called the Strait of Gibraltar connects the Mediterranean with the Atlantic Ocean. The Dardanelles Strait, the Sea of Marmara, and the Bosphorus Strait connect the Mediterranean to the Black Sea in the northeast. In the southeast the Suez Canal links the Mediterranean to the Red Sea. The large islands of

the Mediterranean include Corsica, Sardinia, Sicily, Crete, and Cyprus. The region has mild, wet winters and hot, dry summers.

Some parts of the Mediterranean have their own names. For example, the Aegean Sea lies between Greece and Turkey. The Adriatic Sea separates Italy from the Balkan Peninsula.

Economy

Tourism is a major source of money for many countries around the Mediterranean. Tuna, sardines, and anchovies are valuable fish catches. Some Mediterranean countries produce petroleum (oil) and natural gas.

History

The Egyptians, the Phoenicians, the Greeks, and other peoples created great civilizations in the Mediterranean region in ancient times. They sailed across the sea to trade with other peoples. They also used the sea as a route to expand their territories. The Romans did this for almost 1,000 years, beginning in about



Italy's Amalfi coast looks out onto the Mediterranean Sea.

500 BC. They called the Mediterranean Sea *Mare Nostrum*, which means “our sea.” Beginning in the AD 600s Muslim Arabs began to move from Arabia into North Africa and Spain. In the centuries that followed, the sea continued to serve as a trading route for all the people of the region.

► More to explore

Adriatic Sea • Aegean Sea • Atlantic Ocean • Suez Canal

Meiji

The emperor Meiji ruled Japan from 1867 until 1912. When his reign began, Japan was a simple country that kept itself apart from other countries. By the time it ended, Japan was a modern world power.

Meiji was born on November 3, 1852, in Kyoto, Japan. His original name was Sachi No Miya. He was the son of the emperor Komei. As a child, Meiji was called Mutsuhito. At his coronation (crowning ceremony) in 1868, he took the name Meiji, which means “enlightened government.”

At the time when Meiji became emperor Japan was undergoing major changes. In 1854 Japan had opened its borders to the rest of the world for the first time in 250 years. Many leaders and citizens began calling for change.

At the beginning of Meiji’s rule, Japan’s shoguns (mighty warlords) fell from power. They had controlled the country for hundreds of years. Under Meiji,



A priest of the Japanese religion called Shinto blesses children during a festival at the Meiji Shrine. The Meiji Shrine in Tokyo, Japan, was built to honor Emperor Meiji.

however, the emperor became the head of the government.

During his reign Meiji approved many more changes. He made powerful landowners turn over their land to farmers. He ordered a new school system. He also ordered a modern system of government. A new constitution went into effect in 1889. The Japanese Diet, a national assembly, first met in 1890.

In addition, Meiji pushed for a modern army and navy to replace Japan’s traditional warriors, the samurai. During Meiji’s reign, Japan won wars with China and Russia.

Unlike earlier emperors, Meiji allowed the common people to see him. He also wore Western clothing. Meiji died in Tokyo, Japan, on July 30, 1912.

► More to explore

Japan

Mekong River



The Mekong is the longest river in Southeast Asia. It flows for about 2,700 miles (4,350 kilometers) through China, Laos, Thailand, Cambodia, and Vietnam.

The Mekong begins at a height of more than 16,000 feet (4,900 meters) in the mountains of Tibet. At first it flows very swiftly through the rugged land of southwestern China. Later in its course the river becomes calmer and wider. It forms the boundary between Laos and

Myanmar and part of the boundary between Laos and Thailand.

Near Phnom Penh, Cambodia, the Mekong is linked to the Tonle Sap, or the Great Lake. During the rainy season the river's swollen waters back up into the Tonle Sap. South of Phnom Penh, the Mekong flows through Vietnam. It eventually empties into the South China Sea south of Ho Chi Minh City.

The Mekong creates a huge delta, or triangular piece of land, in southern Vietnam. The delta has rich soil and is one of the world's great producers of rice. Farmers are able to grow rice even during the dry season because they can use the Mekong's waters to irrigate, or water, their fields.

► More to explore

Delta • Irrigation • River

Melon

Melons are sweet fruits. They have a fragrant, juicy inside that is usually eaten fresh. Melons are a good source of vitamins A and C. Common melons include cantaloupe, honeydew, and casaba. Melons are related to gourds, cucumbers, pumpkins, and squashes. Watermelons also are related, but they are not considered true melons.

Melons originally grew in central Asia. Today people grow them in warm areas throughout the world. Melon plants are annuals. This means that they last for only one growing season. They must be replanted the following year.



A woman rows a boat in the Mekong delta region of Vietnam.



Melons, including cantaloupe and honeydew, are healthy and tasty fruits. Watermelons are related to these fruits, but they are not true melons.

Melon plants are vines that are 7 to 8 feet (2.1 to 2.4 meters) long. The leaves are large and usually rounded. The flowers are yellow and shaped like a bell. They are about 1 inch (2.5 centimeters) across. The fruits differ in size, shape, texture, color, and flavor. They weigh about 2 to 9 pounds (1 to 4 kilograms). Melon plants need a lot of water.

All melons have hard rinds, or skins, that protect the fleshy inside, called the pulp. The pulp can be white, green, or orange. Many seeds grow in the middle of the pulp. People sometimes dry the seeds and eat them as snacks or use them in cooking. A melon must be ripe before it is picked.

► More to explore

Fruit

Memorial Day

In the United States, Memorial Day honors the memory of soldiers who died in the nation's wars. The holiday falls on the last Monday in May. On Memorial Day, Americans attend parades, church services, and other social events. People also decorate soldiers' graves with flowers and flags. The president of the United States often visits the Tomb of the Unknowns at Arlington National Cemetery. The tomb honors unknown American soldiers who fought for their nation.

Memorial Day began in about 1866, after the American Civil War. People wanted to honor the soldiers who had died in that war's battles. Women's groups began laying flowers on soldiers' graves. Because the day included decorating graves, it was originally called Decoration Day. After World War I (1914–18) the name of the holiday was changed from Decoration Day to



People visit a World War II memorial in Washington, D.C., on Memorial Day.

Memorial Day. For many, the holiday also signals the beginning of summer.

► **More to explore**

American Civil War • World War I

Memory

Memory is the process of storing experiences in the brain and recalling them later. People use their memories during every moment of their lives. They must remember words and ideas to speak or to write. Even to walk or to eat, people remember the movements they learned as children.

Scientists know that memories cause chemical changes in the neurons (nerve cells) in the brain. The chemical changes create what are called memory paths. These paths can remain in the brain for seconds or for a person's entire life.

Levels of Memory

Many scientists believe that there are two levels of memory. One level is short-term memory, or working memory. The other level is long-term memory, or permanent memory.

Short-term memory is a way to store information temporarily. It lasts about 15 to 30 seconds. An example is keeping a telephone number in mind after looking it up and while dialing.

Long-term memory is the storage of information for longer periods. It can last days, months, years, or a lifetime. Repeating and practicing motions or tasks help the brain to store information



Looking at family photographs can bring back happy memories.

for a long time. If a person dials a telephone number many times, the number will move from short-term to long-term memory.

Types of Memory

Scientists also think that there are different types of memory. These include motor-skill, factual, and emotional memory.

Motor-skill memory tells people how to do physical things that they have done before. It can be short-term or long-term. People use motor-skill memory to copy a dance step and to ride a bicycle.

Factual memory is the storage of facts. It can be short-term or long-term. Factual memory lets people remember faces, numbers, and the experiences that happen to them.

Emotional memory is the memory of emotions. It is long-term. For example, people tend to remember very frightening experiences throughout their lives. Some scientists think this happens so

Did You Know?

Some people can memorize what an object looks like after only a glance. This is called having a photographic memory.

that people are prepared for problems in the future.

Remembering

People can pull out information stored in memory through either recall or recognition. Recall means that someone can remember something learned earlier. Recognition is the ability to identify something that has been seen or experienced before. Recognition is easier than recall. It may be easy to recognize a person's face, but it is more difficult to recall the person's name.

Patterns are also easier to remember than random information. For example, it is easier to remember a poem that rhymes than one that does not.

Forgetting

Being unable to remember things is called forgetting. A major reason for forgetting is the passage of time. People also tend to forget things that they do not practice or review. Sometimes a dis-

ease or an injury to the brain can cause people to forget.

In general, people do not like to forget. But forgetting serves some important purposes. The brain forgets information that it no longer needs. Then it may be open to learning new information. Forgetting can also help people to survive painful experiences.

► More to explore

Brain

Meningitis

Meningitis is a disease that involves the membranes, or thin coverings, around the brain and the spine. Meningitis is the inflammation, or swelling, of these membranes. Germs called viruses and bacteria can cause meningitis.

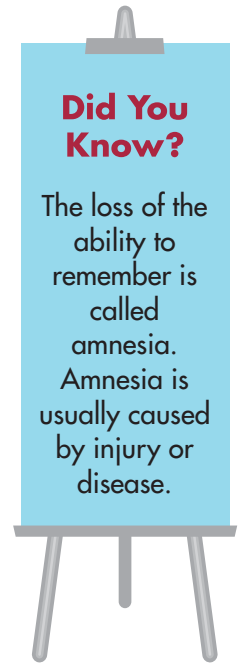
Common symptoms of meningitis are a high fever, a headache, and a stiff neck. People with meningitis also may be tired and have a rash.

Viral meningitis, or meningitis caused by a virus, is usually mild. It often goes away without medical treatment. Bacterial meningitis, or meningitis caused by bacteria, is usually very serious. If not treated right away, bacterial meningitis can cause brain damage, deafness, or death.

The viruses and bacteria that cause meningitis spread easily between people. They can be passed through touching, coughing, or kissing. However, not everyone in contact with the viruses or

Did You Know?

The loss of the ability to remember is called amnesia. Amnesia is usually caused by injury or disease.



Learning to ride a bicycle involves remembering the movements needed to balance, steer, and pedal.

bacteria gets meningitis. Young children and people who are already sick are more likely to get the disease.

There are vaccines, or shots, that can prevent bacterial meningitis. Frequent hand washing also can help to prevent infection by the viruses and bacteria that cause meningitis.

If a person has meningitis, doctors need to find out the cause. They do this by taking fluid from the spine and testing it. People with bacterial meningitis receive a medicine called an antibiotic. With quick treatment, they usually recover. Most people with viral meningitis just need to rest. After several days, they usually feel better.

► More to explore

Bacteria • Disease, Human • Vaccine
• Virus

Mental Illness

When people have a mental illness, or disorder, they cannot control certain feelings, thoughts, or actions. Those unusual feelings, thoughts, or actions often cause problems in their daily life. Some mental disorders are mild and may go away on their own. Others are serious illnesses that require medical treatment.

Types of Mental Illness

Anxiety Disorders

People with anxiety disorders often become afraid, even in safe situations. They may feel helpless, dizzy, or short



People with a mental illness may not be able to control their feelings.

of breath. Sometimes the fear happens for no reason. In other cases the fear is due to a specific thing—for example, heights, crowds, or closed spaces. Anxiety about a specific thing is called a phobia.

Psychotic Disorders

People with psychotic disorders confuse real life with fantasy. They may see or hear things that are not there. They may believe that they are someone else. Schizophrenia is an example of a psychotic disorder. People with schizophrenia do not react in usual ways to conversations or events.

Mood Disorders

People with mood disorders suffer from depression (extreme sadness) or mania (extreme excitement). With depression, people feel sad, hopeless, and tired for an unusually long time. With mania, people feel extremely happy, confident, and energetic. They are often too excited

Did You Know?

In the Middle Ages (AD 500 to 1500) people thought evil spirits caused mental illness.

to think clearly, however, and may make poor decisions.

Mental Disorders in Children

Some mental disorders can begin during childhood or adolescence (the teenage years). Attention-deficit/hyperactivity disorder (ADHD) is the most common one. Children with ADHD may have trouble paying attention in class. They may find it difficult to stay seated for long. ADHD is more common in boys than in girls.

Eating disorders—including anorexia and bulimia—are serious mental illnesses that usually start during adolescence. People with eating disorders, usually girls, have a strong fear of gaining weight. They often think they are fat when they are really thin. People with anorexia eat very little food. People with bulimia eat a lot of food and then make themselves throw up. Eating disorders can cause physical problems and even death.

Causes

Mental illness may be caused by chemical problems in the brain, genetics, environmental factors, or a combination of these things. For example, chemical problems in the brain may cause mood disorders or schizophrenia. Genetics may also be responsible, however: children whose parents have schizophrenia or depression are more likely to have those disorders. Environmental factors—such as child abuse or extreme stress—may add to the likelihood of mental illness. For many mental illnesses, the exact causes are unknown.

Treatment

Psychiatrists are medical doctors who treat the mentally ill. Psychiatrists may prescribe medication to reduce the symptoms of some mental disorders. Some medications are very effective. They allow patients to resume normal lives.

Psychotherapy (often called simply therapy) is another effective treatment for many mental disorders. During therapy, patients talk about their feelings and behaviors with a therapist. Therapists include psychiatrists, psychologists, social workers, and counselors. Therapists help people learn to control the symptoms of their mental disorder.

Did You Know?

Austrian doctor Sigmund Freud helped develop “the talking cure.” Patients talk about their feelings and actions with a therapist.



Children who survived a terrible storm in Indonesia do art therapy. Art therapy can help children to deal with stress. If not treated, extreme stress can cause some types of mental illness.

Mercury

Mercury is one of the planets that orbit, or travel around, the sun in the solar system. It is the closest planet to the sun.



A picture taken from a spacecraft shows the cratered surface of Mercury.

Its orbit, or path, is between the sun and the orbit of the planet Venus. Mercury's average distance from the sun is about 36 million miles (58 million kilometers). It travels around the sun at a faster speed than any other planet.

Physical Features

Mercury is the smallest planet of the solar system. It is less than half the size of Earth. Mercury's diameter, or distance through its center, is about 3,000 miles (4,900 kilometers). It is a solid, rocky planet. Mercury is very heavy for its size. This is because it has a huge core, or center, made of iron.

Mercury's landscape includes flat plains and long, steep cliffs. Its surface is scarred by pits called craters. The craters form when chunks of rock or metal called meteorites hit Mercury. Some parts of the surface have many

craters, while other parts are very smooth.

A thin atmosphere, or layer of gases, surrounds Mercury. It does not keep in heat well. Mercury has daytime temperatures of about 755° F (400° C). However, the temperature may fall to about -280° F (-173° C) before dawn.

Orbit and Spin

Like all planets, Mercury has two types of motion: orbit and spin. Mercury orbits, or travels around, the sun very quickly. It orbits at an average rate of about 30 miles (48 kilometers) per second. Mercury completes one orbit around the sun every 88 Earth days. In other words, one year on Mercury lasts 88 Earth days.

On the other hand, Mercury spins very slowly. The planet takes nearly 59 Earth days to rotate once about its center.

This combination of a fast orbit and a slow spin leads to an unusual situation. A day on Mercury—the time it takes for the sun to appear straight overhead, to set, and then to rise straight overhead again—lasts about 176 Earth days. So on Mercury a “day” is longer than a “year.”

Observation and Exploration

Mercury is so close to the sun that it is difficult to see it well from Earth. Much of the information known about Mercury came from Mariner 10, the first spacecraft to visit the planet. The unmanned U.S. craft flew by Mercury in the 1970s. The United States

launched a second unmanned craft, called Messenger, to Mercury in 2004.

► More to explore

Meteor and Meteorite • Planets • Solar System • Space Exploration • Sun

Mercury, god

► see Hermes.

Meredith, James

James Meredith was a leader of the civil rights movement. In 1962 he became the first African American student at the University of Mississippi. His struggle to enter the school made him famous throughout the United States.

James Howard Meredith was born on June 25, 1933, in Kosciusko, Missis-



Civil rights leader James Meredith is pictured at the University of Mississippi.

sippi. From 1951 to 1960 he served in the U.S. Air Force. Then he entered Jackson State College, in Jackson, Mississippi. At that time all schools in Mississippi were segregated by race. This meant that black and white students went to separate schools. Jackson State College had only black students.

In 1961 Meredith applied to the all-white University of Mississippi. It rejected him twice. Meredith then asked the National Association for the Advancement of Colored People (NAACP) to file a lawsuit against the school. In 1962 the U.S. Supreme Court ordered the school to admit Meredith.

But the governor of Mississippi still tried to stop Meredith from attending the school. Violence broke out among people who wanted to keep Meredith out. President John F. Kennedy sent thousands of U.S. soldiers to help Meredith enter the school. Some soldiers stayed to protect Meredith until he graduated in 1963.

Meredith later earned a law degree from Columbia University in New York City. In 1966 he led a march through the South to encourage African Americans to vote. During the march he was shot, but he recovered. In later years Meredith turned away from the civil rights movement.

► More to explore

Civil Rights Movement • National Association for the Advancement of Colored People

Did You Know?

Meredith's 1966 march was called the "March Against Fear."

Mesopotamia



Mesopotamia is a Greek name that means “land between the rivers.” It describes an ancient region between the Tigris and Euphrates rivers in the Middle East. Some of the world’s first civilizations developed in Mesopotamia. Today the region is part of Iraq.

Sumer and Akkad

The earliest known civilization started in southern Mesopotamia in about 4500 BC. It was called Sumer. The people of Sumer found that the soil was good for growing crops. Because there was little rain, the people built irrigation systems to carry water from the rivers to their fields. After 4000 BC the world’s first cities began in Sumer. Sumerian cities included Kish, Uruk, Ur, and Lagash. In about 3000 BC the Sumerians created the world’s first writing system, called cuneiform.

North of Sumer was the region called Akkad. Beginning in about 2350 BC an Akkadian ruler named Sargon conquered Sumer and much of the rest of Mesopotamia. This was the world’s first empire.

Babylonia and Assyria

In about 1900 BC people called the Amorites conquered all of Mesopotamia. Under their rule Babylon became the most important city in Mesopotamia. Because the city was so powerful, the whole region became known as Babylonia. The most important Babylonian king was Hammurabi. He is famous for a set of laws made during his reign.

Babylonia began to lose strength after about 1600 BC. The next major power in Mesopotamia was Assyria. In the 1300s BC the Assyrians began to build an empire in northern Mesopotamia and beyond. In 671 BC the Assyrians expanded their rule all the way to Egypt. The Assyrian Empire ended in about 609 BC.

After the fall of Assyria, people called the Chaldeans created a new Babylonian empire. In 539 BC invaders from Persia conquered the Chaldeans. The conqueror Alexander the Great defeated the Persians in about 330 BC. Then Mesopotamia was ruled in turn by the Greeks, Romans, Arabs, and Turks. In 1921 Mesopotamia became the kingdom of Iraq.

► More to explore

Civilization • Iraq • Writing

Metacom

Metacom was the leader of the Wampanoag, a group of Native Americans. The Wampanoag traditionally lived in what are now Rhode Island and Massachusetts. The English called Meta-



An illustration shows Metacom, who led the Wampanoag against settlers in King Philip's War. It was one of the deadliest wars between settlers and Native Americans.

com King Philip. Metacom is best known for his role in King Philip's War, an uprising against English settlers.

In about 1620 English settlers began occupying the Wampanoag's land. These settlers were the Pilgrims of the Plymouth Colony. Metacom's father, Massasoit, was the chief of the Wampanoag at the time. Massasoit kept peace with the newcomers until his death in 1661. Metacom became chief in 1662. By this time many new settlers were arriving. They wanted to take increasing amounts of the Wampanoag's land without paying for it.

This caused Metacom to ask other tribes to help him fight the English. The battle came to be known as King Philip's War. Metacom proved to be an able military

leader, but after a year of fighting the Indian alliance began to fall apart. Metacom fled to what is now Rhode Island. On August 12, 1676, he was killed by an Indian who was fighting on the English side.

► More to explore

King Philip's War • Massasoit • Native Americans • Plymouth Colony
• Wampanoag

Metal

Metals are a large family of more than 70 chemical elements. Chemical elements are the basic substances that make up the universe. People use metals to make countless things, from toasters to skyscraper buildings.

What Metals Are Like

Metals are usually easy to recognize. Every metal except mercury is solid at room temperature. (Mercury is liquid.) Most metals are gray in color and shiny in appearance. Many metals are quite hard. Metals can be stretched into wire or rolled into sheets. Many metals conduct, or carry, electricity well.

Where Metals Are Found

Living things have certain metals within some of their cells. But the metals that people use to make things are found in Earth's crust. Only gold and a few other metals can be found in pure form. Most metals are always found in the form of chemical compounds. (Chemical compounds are mixtures of two or more

Did You Know?

Ancient peoples used the metals bronze and iron to make tools and weapons.



The metal in a garden chair has been shaped into flower designs. Metals are solid and very strong at room temperature. But when heated, metals become liquid. This makes it easy to form them into different shapes.

chemical elements.) A rock that contains a metallic chemical compound is called an ore.

Extracting Metals

Metallurgy is the science of separating metals from ore and then working with the metals. The first step in producing a metal is to crush the ore into small pieces. The next step is to purify, or clean, the ore.

Metallurgists then take apart the chemical compound that contains the metal. Sometimes they heat the ore so that the chemical elements separate and liquid metal flows out. This process is called smelting. Metallurgists also use electricity and chemicals to separate metal from ore.

Workers then shape the metal. They may shape it by pouring it into a mold, hammering it on a hard surface, rolling it into sheets, or forcing it through openings.

Alloys

Metallurgists sometimes melt metals and mix them together with other metals or with nonmetals. This produces new metals called alloys. Steel is an alloy of iron and carbon. Bronze is an alloy of copper and tin. An alloy has different characteristics than a metal alone. It may be stronger or stand up better to heat.

History

Gold and copper were the first metals to be discovered. Then came silver, lead, tin, iron, and mercury. At first, people simply hammered metals into shape. Then they learned to melt metals and



Giant conveyor belts carry ore, or rock containing metal, that has been dug from the ground. The metal must be separated from the ore before it can be used.

pour them into molds. More than 5,000 years ago, people made the first alloy—bronze. More than 3,000 years ago, people learned to purify iron, which is stronger than bronze.

During the Middle Ages (AD 500–1500) people tried to change lead and other metals into gold. They did not succeed, but they found out many things about metals. Modern scientists have discovered many new metals and have learned to use metals in many new ways.

► More to explore

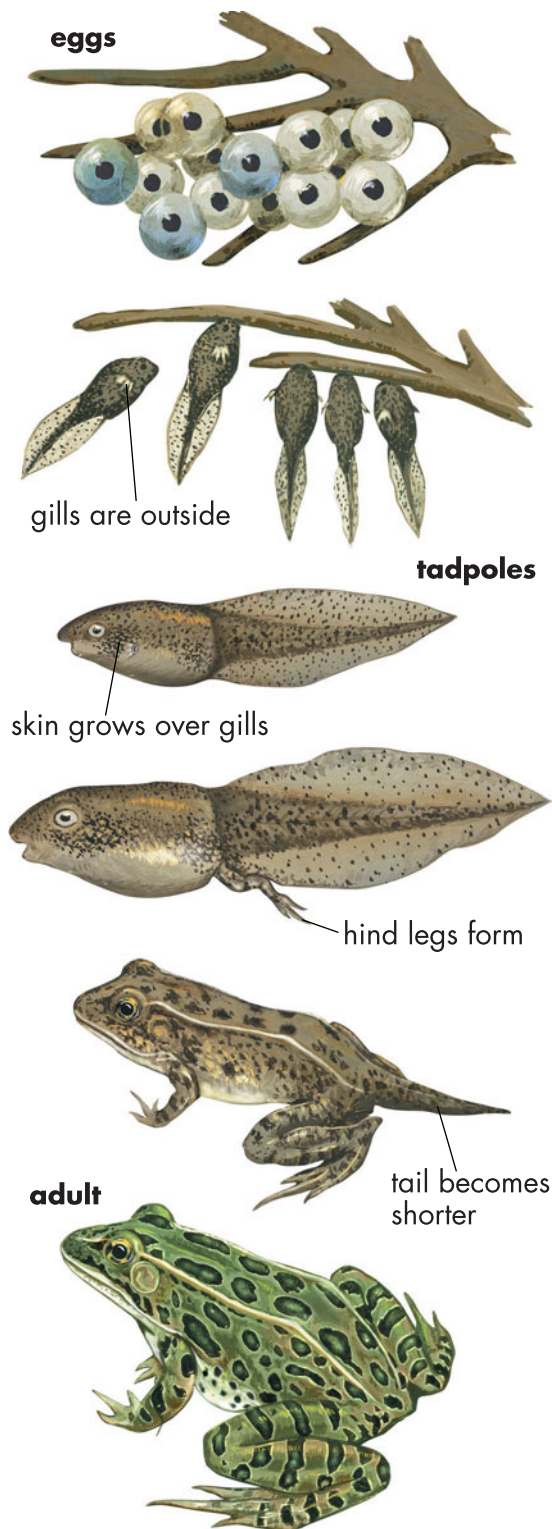
Alloy • Bronze • Chemical Element
• Iron

Metamorphosis

Metamorphosis is a process some animals go through to become adults. It is a series of physical changes. Metamorphosis is especially common in insects. Genes and chemicals called hormones control the process.

Many insects go through four stages of metamorphosis: egg, larva, pupa, and adult. An insect hatches from an egg into a wormlike larva. Caterpillars are examples of insect larvae. The larva eats a lot. As it grows, the larva molts, or sheds its outer covering. To begin the pupa stage, the larva often builds a protective covering, such as a cocoon. Inside this covering the pupa develops wings and adult body parts. It comes out of its covering as an adult.

Beetles, butterflies, flies, and wasps are among the insects with four stages of



Through metamorphosis, a frog develops from an egg to a tadpole and then to an adult.

metamorphosis. Some insects, such as grasshoppers and termites, have fewer stages.

Metamorphosis also happens in animals other than insects. Most amphibians go through metamorphosis. For example, a frog begins life as a tadpole. A tadpole has a short, oval body with a tail. It gradually develops legs and loses its tail to become an adult frog. Starfish, crabs, lobsters, snails, and clams also go through metamorphosis.

► **More to explore**

Amphibian • Butterfly and Moth
• Hormone • Insect

Meteor and Meteorite

A meteoroid is a chunk of rock or metal from space that falls through the atmosphere, or layer of gases, surrounding Earth. Most meteoroids burn up in the atmosphere. This creates a bright streak of light called a meteor. Meteors are also called shooting stars. If a meteoroid survives its fall and reaches Earth's surface, it is called a meteorite.



A meteorite formed the huge pit called Meteor Crater in the U.S. state of Arizona.

Almost all meteoroids are formed from material that breaks off objects in space called comets or asteroids. The chunk of rock or metal may enter Earth's atmosphere traveling as fast as 45 miles (72 kilometers) per second. Most meteoroids melt from the heat or break up from the pressure within seconds.

At times people can see thousands of meteors per hour. These meteor showers often occur as Earth passes through the path of a comet. Bits of rock and ice left behind by the comet plunge through Earth's atmosphere, creating meteors.

Occasionally large meteorites strike Earth and create pits called craters. For example, Meteor Crater in the U.S. state of Arizona is 4,000 feet (1,200 meters) across. It was formed when a meteorite crashed into the ground thousands of years ago. Meteorite crashes also make craters on other planets and moons.

► **More to explore**

Asteroid • Atmosphere • Comet

Mewuk

► see Miwok.

Mexican War

From 1846 to 1848 the United States fought a war with Mexico. North Americans now know the conflict as the Mexican War. As a result of the war, the United States took over the land that later became New Mexico, Utah,

Nevada, Arizona, California, Texas, and western Colorado.

Background

In 1845 Mexico and the Republic of Texas both wanted the same piece of land. (At the time Texas was an independent country.) The land they both wanted was north of the river called the Rio Grande. The United States soon joined the quarrel because Texas was about to become a state. Both sides sent soldiers to the area. In May 1846 the United States declared war against Mexico.

War

The United States attacked from several directions. General Zachary Taylor crossed the Rio Grande and won victories in Mexico. In February 1847 he defeated a major Mexican force at the battle of Buena Vista.

General Winfield Scott marched across the Gulf of Mexico area. He captured the important seaport of Veracruz. Scott then marched inland. In September 1847 he captured Mexico City, the capital of Mexico.

Colonel Stephen Kearny easily took New Mexico. Kearny, Commodore Robert F. Stockton, and Lieutenant Colonel John C. Frémont conquered California. In January 1847 the last areas were under U.S. control.

Results

The Treaty of Guadalupe Hidalgo formally ended the war. The United States and Mexico signed it on February 2,



General Zachary Taylor is pictured on a white horse at the battle of Buena Vista during the Mexican War.

1848. The treaty gave the United States more than 500,000 square miles (1,300,000 square kilometers) of Mexican territory—from the Rio Grande west to the Pacific Ocean. The United States paid Mexico 15 million dollars in return.

General Taylor was considered a hero for his actions during the war. As a result he was elected president of the United States in 1848.

Taylor and the U.S. Congress then had to deal with the question of allowing slavery in the new areas. Congress had allowed Texas to have slavery. But in 1850 it let California ban slavery. It gave other territories the right to vote on whether to have slavery. Still, arguments over slavery continued, and both sides grew more apart. The disagreement over slavery finally led to the American Civil War in 1861.

► More to explore

Frémont, John Charles • Mexico
• Taylor, Zachary • Texas



Mexico

Mexico is a large country that sits between the United States and Central America. Mexico has a rich mixture of European and American Indian cultures. The capital, Mexico City, is one of the largest cities in the world.

Geography

Mexico takes up the southern part of North America. It shares borders with the United States, Guatemala, and Belize. The Pacific Ocean lies to the west, beyond a peninsula called Baja California. The Gulf of Mexico and the Caribbean Sea are to the east of Mexico.

Most of the land is a plateau, or raised flat area, surrounded by mountains. The nation's highest peak is a volcano called Citlaltépetl. It rises 18,701 feet (5,700 meters). Near the coasts are low plains. A major river, the Río Bravo del Norte (called the Rio Grande in the United States), forms part of the border between Mexico and the United States.



The remains of the ancient city of Teotihuacán in Mexico include pyramids, temples, and palaces. The city reached its peak in AD 500.

Mexico's climate depends on the height of the land. The lowlands are hot year-round. Temperatures are milder at the middle heights and cold at the highest peaks. Much of northern Mexico is dry. The southern mountains and the coastal plains get the most rain. Earthquakes are common in Mexico.

Plants and Animals

Cacti and yuccas grow in the dry regions. Rain forests and grasslands grow in the south and the east. Some of the mountains have evergreen forests. Mangrove swamps are common on the southern coast.

Monkeys, parrots, and jaguars live in the southern forests. Deer, pumas, coyotes,

rabbits, snakes, and armadillos live in the dry north.

People

More than half of the people in Mexico are mestizos. They have both American Indian and European ancestors.

American Indians form the next largest group. White Europeans form a smaller group.

Most Mexicans are Roman Catholics. The main language is Spanish. More than 50 Indian languages are also spoken. Most Mexicans live in cities.

Economy

Services such as transportation, education, and health care make up a large part of Mexico's economy. Tourism is a major service industry. Millions of tourists visit Mexico's resorts and ancient ruins each year.

Manufacturing and mining are also very important. Factories produce cars, machinery, food and beverages, metals, chemicals, clothing, and other goods. Mexico extracts oil, natural gas, and minerals from the earth. The country is also the world's largest producer of silver.

Agriculture is a smaller part of the economy, but many Mexicans still work as farmers. The major crops include sugarcane, corn, fruits, vegetables, and beans. Cattle and pigs are the main livestock. Logging and fishing also add to the economy.



Members of a Mexican dance company wear colorful costumes. The dance company, called Ballet Folklórico de México, performs traditional Mexican dances.

History

Humans have lived in what is now Mexico for more than 10,000 years. The region's first people were American Indians. They built settlements after they learned to grow corn, beans, and squash. Eventually the Olmec, Maya, Toltec, and Aztec peoples built great civilizations.

Spanish Rule

The Aztec ruled much of Mexico when the Spanish arrived in 1519. Two years later the Spanish soldier Hernán Cortés and his troops conquered the Aztec Empire. Mexico then became part of the Spanish territory known as New Spain. The Spanish forced many Indians to become Christians. They also made the Indians work on plantations and in mines.

The people of Mexico fought against Spanish rule between 1810 and 1815. In 1821 Spain gave Mexico its independence. Mexico was a monarchy until 1823, when it became a republic.

Facts About MEXICO



Population
(2008 estimate)
106,683,000

Area
758,449 sq mi
(1,964,375 sq km)

Capital
Mexico City

Form of government
Republic

Major cities
Mexico City, Guadalajara, Puebla, Ciudad Netzahualcóyotl, Juárez, Tijuana, Monterrey, León



TIMELINE

Spain conquers the Aztec Empire in North America.		Mexico loses land to the United States after the Mexican War.		The Mexican Revolution ends rule of dictator Porfirio Díaz.		Vicente Fox becomes the first non-PRI president in 71 years.
1521	1821	1848	May 5, 1862	1911	1929	2000
	Mexico gains independence from Spain.		Mexico defeats invading French forces.		The political party called PRI takes power.	

Texas and the Mexican War

General Antonio López de Santa Anna became president of Mexico in 1833. He faced trouble in Texas, which then belonged to Mexico. In 1836 the people of Texas rebelled against Mexican rule. Santa Anna tried to stop the rebellion, but he failed.

The United States took over Texas in 1845. That led to the Mexican War between Mexico and the United States. Mexico lost the war in 1848. It gave up a large section of its land to the United States.

French Invasion

Benito Juárez became president of Mexico in 1861. Later that year European powers invaded Mexico to collect money that Mexico owed them. Mexico defeated French forces in a battle that is celebrated today on the holiday Cinco de Mayo. However, France took control in 1864 and ruled until 1867.

Mexican Revolution

The military leader Porfirio Díaz seized control of Mexico in 1876. He ruled as a dictator for 35 years. The Mexican Revolution of 1911 forced Díaz from power. Among the leaders of the revolution were Emiliano Zapata and Pancho Villa. The revolutionary leaders won rights for poor farmers and workers.

Modern Mexico

In 1929 revolutionary leaders formed a political party that became known as the Institutional Revolutionary Party (PRI). The PRI controlled Mexico for the rest of the century. Many Mexicans disliked the PRI's control. In the 1990s rebels in the Mexican state of Chiapas fought against the government for several years. The election of President Vicente Fox in 2000 ended 71 straight years of PRI rule.

► More to explore

Aztec • Cinco de Mayo • Mexican War • Mexico City • Villa, Pancho • Zapata, Emiliano

Mexico, Gulf of



The Gulf of Mexico is a huge body of water off the southeastern coast of North America. It is almost surrounded by the United States and Mexico. Cuba is to the east. Waterways called straits connect the gulf to the Atlantic Ocean and the Caribbean Sea. The Mississippi River and Rio Grande flow into the gulf.

The gulf greatly affects the climate of the southeastern United States. The winds that blow north across the gulf pick up moisture from it. The moisture

falls as heavy rain along the coast. Hurricanes often hit the coast.

The Gulf of Mexico contains valuable supplies of oil and natural gas. Drilling for oil and gas is a major industry off the coasts of the U.S. states of Texas and Louisiana. Fishing is also important in the gulf. Fishers catch shrimps, flounder, red snappers, mullet, oysters, and crabs. Tourism is another leading industry along the Gulf Coast, especially during the winter.

► More to explore

Mississippi River • Rio Grande

Mexico City



Population
(2005 census),
city, 8,463,906;
(2007
estimate), urban
area,
19,028,000

Mexico City is the capital of the country of Mexico. It is one of the oldest cities in North America. It is also one of the world's largest cities. Mexico City is the center of Mexico's economy and a major center of culture and education.

Mountains surround Mexico City. It lies about 7,350 feet (2,240 meters) above sea level.

Places of Interest

The plaza called the Zócalo is the traditional city center. Many historic build-



Many hotels and tourist sites are located along the Gulf of Mexico.



The Antigua Basílica of Guadalupe stands in Mexico City. A basilica is a type of church.

ings, such as the National Palace, surround the plaza. Several buildings in the area have murals, or wall paintings, by the artist Diego Rivera. In another neighborhood is the former house of the artist Frida Kahlo. It is now a museum about her life.

Many tourists visit an area called Xochimilco to see its “floating gardens.” They are man-made islands on which plants are grown.

Economy

Much of Mexico’s banking and industry takes place in Mexico City. Tourism, insurance, and other businesses that provide services also bring money to the city. Construction is one of Mexico City’s leading industries. Factories in the city make chemicals, plastics, cement, cloth, and many other products.

History

Mexico City has been a large and important capital for hundreds of years. It began in the 1300s, when the Aztec Indians founded a city on the site. They

named their city Tenochtitlán. They ruled a huge empire from there.

The Spanish soldier Hernán Cortés and his troops destroyed Tenochtitlán in 1521. They built a new Spanish city there. Mexico City was the center of Spanish rule in Mexico.

In 1821 Mexico became an independent country. Mexico City became the country’s capital a few years later. In the early 1900s the city was the site of fighting during the Mexican Revolution. A powerful earthquake damaged the city in 1985.

Mexico City grew greatly during the 20th century. In the early 21st century it was among the fastest-growing cities in the world.

► More to explore

Aztec • Cortés, Hernán • Kahlo, Frida
• Mexico • Rivera, Diego

Michelangelo

The Italian sculptor, painter, and architect Michelangelo is considered one of the greatest artists of all time. His work stood out even during the Italian Renaissance, a period known for its many outstanding achievements in art.

Early Life and Works

Michelangelo di Lodovico Buonarroti Simoni was born on March 6, 1475, in Caprese, a town near Florence, Italy. When Michelangelo was 13 he studied



Michelangelo's *Pietà* can be seen in Saint Peter's Basilica in Rome.

art with Domenico Ghirlandajo, a leading painter in Florence.

Michelangelo later moved to Rome. There in 1498 he was asked to carve a *pietà*—an artwork that shows the Virgin Mary supporting the body of Jesus after his death. Michelangelo's *Pietà* is a large sculpture carved from one block of marble. It made Michelangelo famous.

In 1501 Michelangelo returned to Florence to create *David*, a huge marble statue of a young man holding a slingshot. David was a king of ancient Israel who is said to have used only a slingshot to kill the giant Goliath. One of the world's greatest statues, *David* represents the Renaissance idea of a perfect human form.

Sistine and Medici Chapels

In 1505 Pope Julius II called Michelangelo to Rome to work on statues for a tomb. In 1508 the pope asked Michelangelo to paint the ceiling of the Sistine Chapel. Over the next few years Michelangelo covered the ceiling with majestic frescoes, or paintings created on wet plaster.

Michelangelo worked perched on a platform about 60 feet (18 meters) above the floor. Most of the time he painted while lying on his back. His paintings covered 10,000 square feet (930 square meters) of the ceiling. The main scenes show biblical stories, such as God creating Adam, and Hebrew prophets.

Michelangelo later returned to Florence, where he designed a marble chapel for the powerful Medici family. The marble statues he carved for the chapel are some of his greatest sculptures.

Later Years

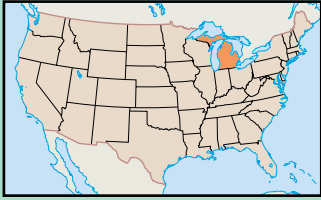
In 1534 Michelangelo started another fresco, the *Last Judgment*, for the Sistine Chapel. He spent most of the rest of his life working on this large painting and writing poetry. He also designed the impressive dome of Saint Peter's Basilica and the Capitoline Square in Rome. However, he did not live to see them completed. Michelangelo died in Rome on February 18, 1564. He was buried in the church of Santa Croce in Florence.

► More to explore

Architecture • Painting • Renaissance
• Sculpture

Did You Know?

Michelangelo sculpted *David* out of a nearly ruined block of marble. Another sculptor had already started to carve the marble.



Michigan

The U.S. state of Michigan is believed to have gotten its name from a Native American word meaning “large lake.” Michigan is the only state to border on four of the five Great Lakes. Sometimes called the Great Lakes State, Michigan has more coastline than any state other than Alaska. The capital is Lansing.

Geography

Michigan is located in the north-central United States. It consists of two large pieces of land: the Upper Peninsula and the Lower Peninsula. The Straits of Mackinac separate the two.

The Upper Peninsula extends north and east from Wisconsin. The peninsula is bordered by Lake Superior on the north and Lake Michigan on the south. On the east a river separates the peninsula from the Canadian province of Ontario.



A red lighthouse stands along the pier in Grand Haven, Michigan. Another structure, which houses a light and a foghorn, stands at the end of the pier.

The Lower Peninsula is shaped like a mitten, with the “thumb” on the eastern side. It is bordered on the west by Lake Michigan and on the south by Indiana and Ohio. Two rivers and a lake separate eastern Michigan from Ontario. The peninsula is also bordered on the east by Lake Huron and Lake Erie.

Michigan has two major natural regions. A rugged, forested tableland covers the western half of the Upper Peninsula. The eastern half of the Upper Peninsula and all of the Lower Peninsula are a plains area with some rolling hills.

People

Whites of European heritage account for about four fifths of the population. Most of Michigan’s early settlers arrived in the 1820s and 1830s. During the 1800s many German, Irish, Dutch, Ital-

ian, and Polish people settled throughout the state.

African Americans make up about 14 percent of Michigan's current population. The number of African Americans increased greatly during the 20th century, from about 16,000 in 1900 to more than 1.4 million by 2000. The state has one of the nation's largest Arab American populations. Many Arab Americans live in Dearborn, a city near Detroit.

Economy

Michigan is one of the nation's leading manufacturing states. Its economy is dominated by the automobile industry. The state is home to three major automobile manufacturers: Ford, General Motors (GM), and Daimler-Chrysler.

Michigan is also a major agricultural state. It is best known for its fruit production. Michigan leads the nation in the production of cherries, and it is a

major provider of apples, grapes, pears, plums, and peaches.

Michigan is one of the nation's leading producers of iron ore. Gravel, sand, limestone, petroleum, and natural gas are produced as well.

History

In the 1600s many Native Americans lived in what is now Michigan. Some of the main tribes were the Ojibwa (Chippewa), the Potawatomi, and the Ottawa. The first white settlers were French fur traders and trappers.

The land that is now Michigan became part of a region called the Northwest Territory in 1787. Michigan joined the Union as the 26th state in 1837.

People in Michigan were strongly against slavery. The state therefore had many stopping places on the Underground Railroad. The "railroad" helped slaves in the South escape to the North or to Canada. During the American Civil War (1861–65) many Michigan men served in the Union Army.

In the early 1900s Michigan became the center of the U.S. automobile industry. During World War II (1939–45), the automobile companies built tanks, warplanes, and other machines that were used in the war. Late in the 20th century U.S. cars became less popular with buyers. This hurt the state.

► More to explore

Great Lakes • Lansing • Underground Railroad

Facts About MICHIGAN

Flag



Population

(2000 census)
9,938,444—rank, 8th state;
(2008 estimate)
10,003,422—rank, 8th state

Capital

Lansing

Area

96,716 sq mi
(250,494 sq km)—rank, 11th state

Statehood

January 26, 1837

Motto

*Si Quaeris
Peninsulam
Amoenam,
Circumspice* (If
You Seek a
Pleasant
Peninsula, Look
Around You)

State bird

American robin



State flower

Apple blossom



The Carp River flows through a forest in the Upper Peninsula of the U.S. state of Michigan.

Michigan, Lake



Lake Michigan is the only one of the five Great Lakes that lies entirely within the United States. The others are on the border between the United States and Canada. Lake Michigan's name comes from the Native American word *michigami*, or *misschiganin*. It means "big lake."

Lake Michigan is the third largest of the Great Lakes. It covers an area of 22,300

square miles (57,800 square kilometers). It is bordered by the states of Michigan, Wisconsin, Illinois, and Indiana. Lake Michigan connects with Lake Huron through the Straits of Mackinac in the north. There are a few islands at the northern end of the lake.

Lake Michigan is part of the Saint Lawrence Seaway. This passage connects the Great Lakes with the Atlantic Ocean. Ships carry raw materials and finished goods to and from the great industrial area along Lake Michigan's southern end. The industrial area centers on Chicago, Illinois. Fishing is another important part of the lake's economy.

Popular summer resort areas dot Lake Michigan's shores. Indiana Dunes National Lakeshore and State Park lies along the southeastern shore. It features long beaches and huge sand dunes.

► More to explore

Great Lakes • Saint Lawrence River and Seaway



Windblown sand dunes can be found in some places near the shoreline of Lake Michigan.

Micronesia, Federated States of



The Federated States of Micronesia is an island country in the western Pacific Ocean. It is made up of more than 600 islands. The capital is Palikir.

The country belongs to the region called Micronesia, which is part of the Oceania region. The country is divided into four states: Yap, Chuuk, Pohnpei, and Kosrae. The largest islands are the peaks of underwater volcanoes. Atolls, or large rings of coral, make up the rest of the land. The climate is hot and humid.

Rain forests grow on the volcanic islands. Coconut, palm, and breadfruit trees grow on the atolls. The country's waters are rich in fish, porpoises, turtles, and giant clams.

The largest group of people is the Chuukese. The Pohnpeians, the Yapese, and the Kosraeans form smaller groups. Nearly everyone is Christian. There are



Fishers use nets in Micronesia.

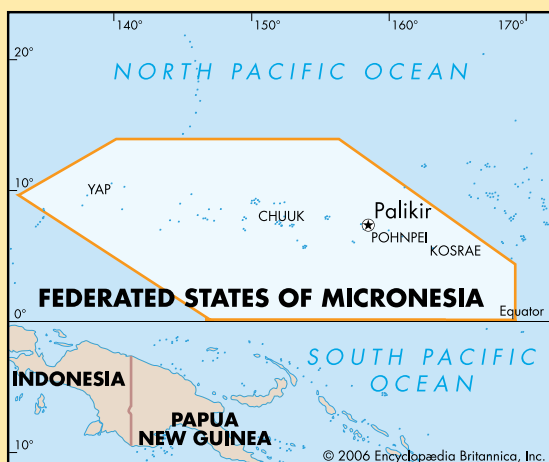
at least eight local languages. English is also common.

The country's economy depends on money from the United States. Most people work for the government or as fishers and farmers. Crops include coconuts, bananas, pepper, and other fruits and vegetables. Tourism is a growing industry.

People came to Micronesia more than 2,000 years ago. Spain made the islands a colony in the late 1800s. Germany, Japan, and the United States all had turns as ruler after the Spanish left.

The Federated States of Micronesia gained independence from the United States in 1986. However, the U.S. military still protects the country.

► **More to explore**
Oceania • Palikir



Facts About MICRONESIA

Population
(2008 estimate)
110,000

Area
271 sq mi (701 sq km)

Capital
Palikir

Form of government
Republic

Major towns
Weno, Tol, Palikir, Kolonia, Colonia

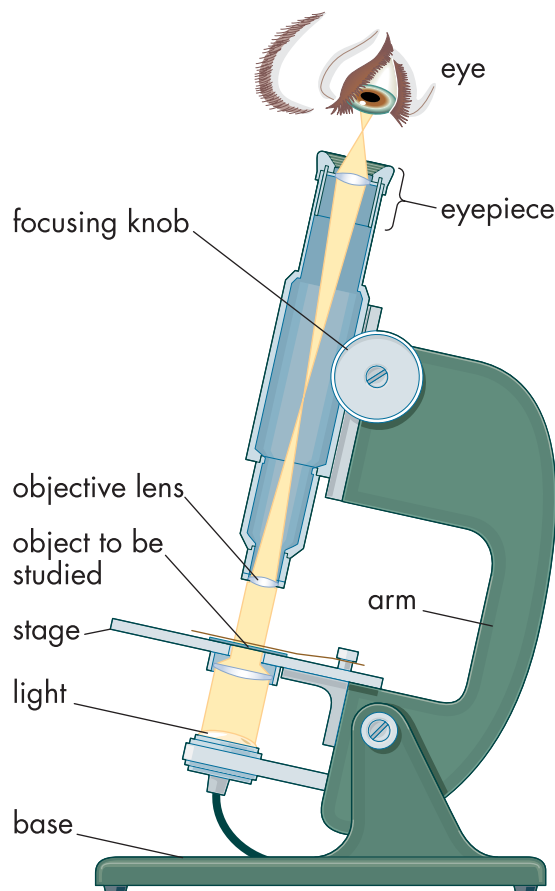
Microscope

A microscope is a device that magnifies tiny objects, or makes them look larger. People use microscopes to see objects that are too small to be seen with the eye alone. Such objects include cells, tiny living things, and grains of sand.

Optical Microscopes

There are several types of microscopes. Optical microscopes, also called light microscopes, work like magnifying glasses. They use lenses, which are curved pieces of glass or plastic that bend light. The object to be studied sits under a lens. As light passes from the object through the lens, the lens makes the object look bigger.

A special type of optical microscope is a compound microscope. A compound microscope has a light that shines on the object from above or below. A lens near the object makes a larger image (picture) of the object. This lens is called an objective lens. Another lens, known as



Some compound optical microscopes can make objects appear 1,000 times larger than their actual size.

the eyepiece, bends the light again. As a result, the eyepiece forms an even bigger image of the image made by the objective lens.

The size of an image depends on the lenses used. For example, an objective lens might make an object appear 10 times larger than it really is. This lens is said to have a magnification of 10 \times . If the eyepiece also has a magnification of 10 \times , the total magnification of the microscope is 10 times 10, or 100 \times .

The magnification of a compound light microscope can go up to about 1,000 \times . This magnifying power makes it possible



Young students use microscopes to study tiny objects.

to study tiny living things such as bacteria, algae, protozoans, and many types of cells.

Electron Microscopes

To view small objects even more closely, scientists use electron microscopes. These microscopes use beams of electrons instead of light to magnify objects. Electrons are some of the particles, or bits, that make up atoms. Electron beams cannot travel far in air. Objects must be put in a vacuum, or airless space, before they can be seen with an electron microscope.

Electron microscopes can magnify objects up to 1 million times. This magnifying power makes electron microscopes very important scientific tools. However, they cannot be used to study living things because living things cannot survive in a vacuum.

► More to explore

Atom • Cell • Lens

Midas

In ancient Greek and Roman mythology Midas was a king known for his foolishness and greed. Stories about him show the importance of thinking before acting or speaking.

In one story someone named Silenus wandered into Midas' gardens and fell asleep. The palace servants found him and took him to the king. Midas treated Silenus with kindness and helped him get home. Silenus was a friend of the god Dionysus. To reward Midas for



King Midas is a figure from ancient Greek and Roman myths.

helping his friend, Dionysus offered to grant Midas a wish. Without thinking, Midas asked that everything he touch turn to gold. Dionysus made it so.

Midas was thrilled by his new wealth. But he soon realized his mistake. When he tried to eat, his food turned to gold. He knew that he would soon go hungry. Midas asked Dionysus to take the wish back, which he did.

In another tale Midas judged a musical contest between the minor god Pan and the powerful god Apollo. Midas awarded the prize to Pan. In revenge Apollo changed Midas' ears into donkey ears.

► More to explore

Apollo • Mythology

Middle Ages

The Middle Ages was the period in European history that came between ancient and modern times. It lasted from about AD 500 to about 1500. The Christian church played an important part in the history of the Middle Ages.



An illustration from a book made in the Middle Ages shows workers building roads outside a town.

Early Middle Ages

The Middle Ages began when Germanic tribes (peoples from northern Europe) invaded the western part of the Roman Empire. The tribes took over the land and formed many small kingdoms.

The invaders also eventually converted to Christianity, which had become the major religion of Rome. The church became the one thing that everyone had in common. The pope was the head of the Christian church. He and other church leaders became very powerful. Few people outside the church could read or write during the early Middle Ages. Religious communities called monasteries therefore were centers of learning.

The most successful king of this period was Charlemagne. He ruled the Franks in the region that is now France and Germany. The pope crowned Charlemagne emperor of the west in 800. However, his heirs were too weak to keep the empire—later called the Holy Roman Empire—in one piece.

From the 800s to the 1000s, Viking invaders attacked many parts of Europe. The Vikings came from what are now Denmark, Norway, and Sweden. They made trouble for many rulers.

During the 1000s, Europeans developed the feudal system to provide security. Landowners called lords built castles. They gave land to followers called knights. In return, the lords called on their knights to defend them in battle. People called serfs or peasants actually

farmed the land. Serfs were not much better off than slaves.

Later Middle Ages

Conditions improved in the 1100s. People learned to grow more nutritious food. Health improved, and the population grew. Towns also grew, and trade increased.

Europeans developed the Gothic style of art and architecture. Christians built stately cathedrals of stone with tall towers and stained glass. Notre Dame in Paris is a good example of a Gothic cathedral. There was also a rebirth of book learning. The first European universities were founded in Bologna, Italy; Paris, France; and other cities.

Between 1095 and 1291, Christian kings and knights from all over Europe participated in a series of Crusades in the Middle East. They went to fight



The Chartres Cathedral in France is an example of Gothic architecture.

Muslims for control of places that Christians consider to be holy.

End of the Middle Ages

The last part of the Middle Ages was a time of trouble. England and France fought the Hundred Years' War between 1337 and 1453. A disease called the Black Death (bubonic plague) killed about one third of the people in Europe between 1347 and 1351.

Various changes led to the end of the Middle Ages. Feudalism weakened as Spain, France, and England became strong countries. Printing was invented in about 1450. This meant that books could be produced easily and in great numbers. Many more people therefore had access to books and could learn to read. Soon the Renaissance, a time of great learning and art, was in progress. Europeans also learned of the Americas in 1492. The discovery led to a new understanding of the rest of the world. It was the first stage of the modern age.

► More to explore

Castle • Cathedral • Charlemagne
• Christianity • Crusades • Europe
• Feudalism • Holy Roman Empire
• Knight • Plague • Renaissance • Rome, Ancient • Vikings

Middle East

The Middle East is the region around the southern and eastern shores of the Mediterranean Sea. It includes the countries that are located where the continents of Europe, Asia, and Africa meet. Geographers and historians do not

Did You Know?

Middle Ages is a term that applies only to Europe. It is usually not used in reference to Asia, Africa, or the Americas.



always agree on which countries should be included in the Middle East. People commonly include the following countries: Turkey, Syria, Lebanon, Israel, Jordan, Iraq, Iran, Afghanistan, Saudi Arabia, Yemen, Oman, the United Arab Emirates, Qatar, Bahrain, Kuwait, Egypt, Libya, and Sudan.

People

Many people of the region are Arabs. Their main language is Arabic. However, many other peoples also live in the Middle East. They speak many different languages. Turks in Turkey speak Turkish. Persians in Iran speak Farsi, or Persian. Jews in Israel speak Hebrew.

Most people in the Middle East follow Islam. But Christianity is common in Lebanon, Egypt, and Syria. Judaism is the main religion in Israel.

Economy

The Middle East contains more than half of the world's petroleum, or oil. The sale of oil has made several Middle Eastern countries very rich. Farming is also important to many countries in the region.

History

Great civilizations arose in the Middle East thousands of years ago. The Egyptian and Mesopotamian civilizations were two of the earliest. (Mesopotamia lay in what is now Iraq.) The powerful Hittite kingdom developed in Anatolia (modern Turkey) after 1900 BC. The ancient region of Palestine was home to the first Jewish state, the kingdom of Israel, about 3,000 years ago.

The Persian Empire ruled much of the Middle East by the 500s BC. The Greeks and the Romans later took control of the region. After the fall of Rome in the AD 400s, the Byzantine Empire ruled the western parts of the Middle East.

Beginning in the 600s, Muslims from the Arabian Peninsula conquered most of the Middle East. Muslim Turks founded the Ottoman Empire in the 1300s. This empire ruled parts of the Middle East into the 1900s.

After World War I (1914–18) European countries took control of much of the



Petroleum, or oil, is treated at a plant in Saudi Arabia. The sale of petroleum is an important part of the Middle East's economy.

area. France controlled Syria and Lebanon. Great Britain ruled over Egypt, Sudan, Palestine, Jordan, Iraq, and southern Yemen. The European powers left the Middle East soon after World War II (1939–45).

The area known as Palestine had long been home to Jews and Arabs. Many of the Arabs were Muslims. The people of Palestine did not agree about who should rule the land. Great Britain helped develop a plan to split the land into two states, one for the Arabs and one for the Jewish people. When the British left in 1948 the Jews declared their part of the land to be the new country of Israel. Israel and its Arab neighbors soon fought a series of wars. Other wars—including a civil war in Lebanon, a war between Iran and Iraq, and the Persian Gulf War—also troubled the Middle East. Fighting in Palestine, Iraq, and other places continued into the 21st century.

► More to explore

Arabian Peninsula • Islam
• Mediterranean Sea • Mesopotamia
• Ottoman Empire • Palestine • Persian Gulf War

Migration, Animal

Many mammals, birds, fish, insects, and other animals move from one place to another at certain times of the year. This movement is called migration. Migration is part of the life cycle of these animals.



Herds of zebras and wildebeests cross a river during their migration.

Animals migrate for different reasons. Many migrate to breed or to find food. Some animals migrate to places where they can hibernate, or rest for the winter. Others migrate because the weather is too hot, too cold, too wet, or too dry during certain times of the year.

Most animals migrate across water, land, or air. Many birds and bats in northern parts of the world fly south for the winter. Some whales swim from cold polar regions to warmer waters in winter. Other migrations are vertical, or up and down. Mule deer in the western United States travel from higher to lower parts of the mountains in winter. Some earthworms move from the top of the soil to deeper underground.

Animals can travel a few miles or several thousand miles. Frogs go short distances to ponds to breed. On the other hand, the Arctic tern spends the summer in the Arctic and the winter in Antarctica. This journey covers about 11,000 miles (18,000 kilometers). Migrations can take place either during the day or at

night. Birds such as geese migrate during the day. Sparrows, warblers, and thrushes travel by night.

Migrating animals can find their way over long and complex routes. They use land features such as rivers and mountains to tell where they are. Scientists think that many animals use the position of the sun and stars to find the way, too. Some animals, such as salmon, use their sense of smell.

► More to explore

Animal • Hibernation

Migration, Human

A long journey to a new home is called a migration. Migrating animals generally go back and forth between summer and winter homes. When people migrate, however, they often are changing homes permanently. Much of human history is the story of migrations.

Kinds of Migration

Some people have no permanent home. Instead, they keep moving from place to place. These people are usually called nomads rather than migrants. Some nomads move back and forth between the summer and winter pasturelands of their animals. Others, such as the Roma (Gypsies), move frequently to find new opportunities. Migrant farmworkers, who move from farm to farm to work, are very much like nomads.

Migration inside a country is known as internal migration. Migration from one country to another is called external migration. A person who moves away from a country is called an emigrant from that country. A person who moves to a country is called an immigrant to the new country.

The promise of good jobs or farmland lures some migrants to a new land. Others want to get away from mistreatment, warfare, or natural disasters in their homeland. Sometimes a government forces people to leave. Migrants who have been forced to leave their country, either by the government or because of harsh conditions, are called refugees.

Captive people have no say in when they leave a country or where they go. The African slave trade was practiced from the 1500s to the 1800s. It brought an estimated 20 million people to North America, South America, and the West Indies. Other captive migrants included criminals who were shipped off to a colony as punishment. European countries transported more than 150,000 convicts to Australia between 1788 and 1867.

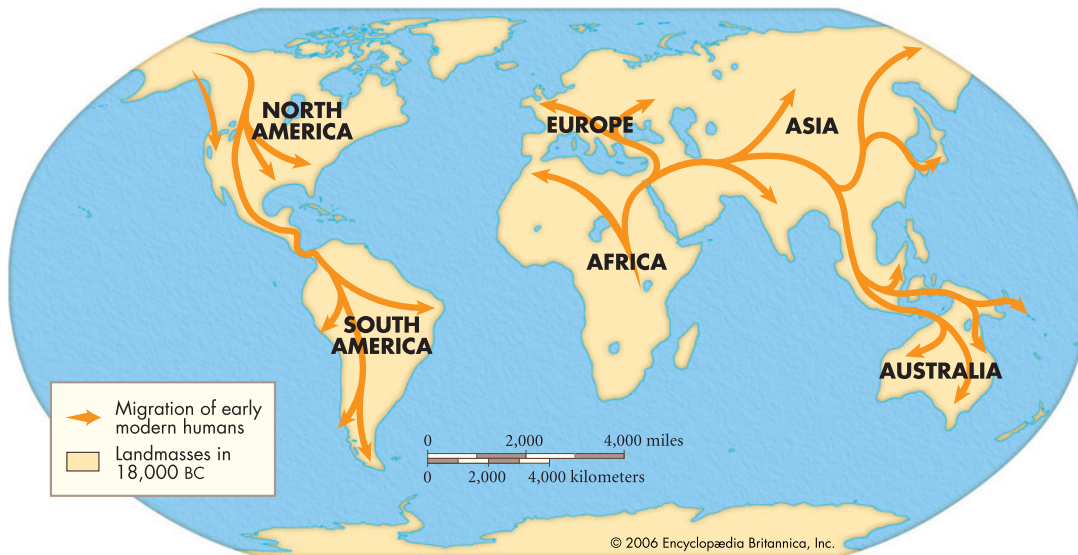
History

Prehistoric and Ancient Migration

Many scientists believe that the earliest humans lived in Africa. From there humans eventually started moving out. They reached Europe and Asia first. From Asia they spread to North America between 60,000 and 20,000 years ago.

Did You Know?

During the 1900s, more than 6 million African Americans moved from farms in the South to cities in the North.



According to many scientists the earliest humans lived in Africa. From there humans spread first to Europe and Asia and later to the Americas.

They may have crossed from Russia to Alaska over a strip of land that is now underwater. Over thousands of years, people spread across North, Central, and South America.

Other prehistoric migrants set out from Asia in boats. They reached Australia about 40,000 years ago. Gradually, they reached all the large islands in the Pacific Ocean. New Zealand was settled last, about 1,200 years ago. Frozen Antarctica is the only continent that migrants never settled.

Later migrations are recorded in history. In one of the earliest historical migrations, the ancient Hebrews moved from slavery in Egypt to freedom in Palestine in the 1200s BC. Later, in the AD 300s and 400s, a number of European tribes invaded the mighty Roman Empire. The invaders, whom the Romans called barbarians, included people called Huns, Goths, and Vandals. In 476 these

migrants brought down the Roman empire in the West.

Migration in the Middle Ages

Wars and conquests made people move during the Middle Ages, from about AD 500 to about 1500. Some peoples fought wars in order to take over new lands. Others were forced from their lands by the invaders. In the 600s armies united by the religion of Islam left the Arabian Peninsula to spread the religion. They conquered northern Africa, western Asia, and Spain. In the 700s a European tribe called the Franks drove the Saxon tribe into northern Europe. Between the 800s and 1000s northern Europeans called Vikings raided and settled in western Europe. Some Vikings who settled in France became known as the Normans. Normans conquered England in 1066. Starting in about 1200, a central Asian people called the Mongols conquered much of Asia and eastern Europe.

Migration to the Americas

The European explorer Christopher Columbus arrived in the Americas in 1492. Migrations from Spain, Portugal, France, England, and the Netherlands followed his voyage. However, the number of immigrants from Europe was small before 1800. The largest immigrant group by far was enslaved Africans. Europeans brought millions of Africans to the Americas.

After 1800, overpopulation, wars, and natural disasters in Europe led to a great migration to the Americas. This was known as the Great Atlantic Migration. Millions of Europeans moved to Canada and South America, but most of the migrants went to the United States.

Germans migrated to Illinois, Missouri, and Wisconsin beginning in the 1830s.



A great number of Europeans, such as this Italian family, migrated to the United States in the 1800s and early 1900s.



A Muslim woman and her children make a new home in Germany.

Norwegians and Swedes arrived in the next few decades in Minnesota, Wisconsin, and the Dakotas. In the 1840s a failure of the potato crop in Ireland brought many Irish people to the United States. Italians, Greeks, and eastern Europeans came later. Between 1880 and 1910 about 17 million Europeans entered the United States.

Early in the 1900s immigration to the United States was so great that the government began setting quotas, or limits. These quotas limited the number of immigrants from specific countries. The United States used these types of quotas until 1965.

Modern Migration

In the late 1900s many people from Latin American countries wanted to move north to the United States. Some crossed U.S. borders without government permission and became illegal immigrants.

Early in the 21st century, Europe had even more immigrants than North

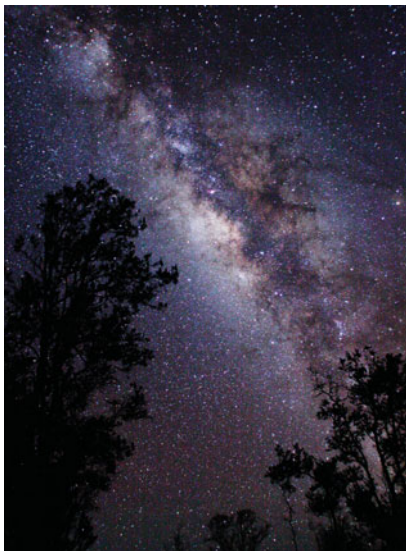
America. Many came from African or Middle Eastern countries. They brought cultural change to Europe.

Meanwhile, the most common kind of migration throughout the world was internal migration, mainly from farming regions into cities. As a result, cities grew very rapidly in much of the world after World War II. This was especially true in developing countries.

► More to explore

Nomad • Refugee • Slavery

Milky Way



The sun and Earth are parts of the Milky Way galaxy.

On a dark, clear night, it is usually easy to see a dusty white band of stars stretching across the sky. This is part of the Milky Way galaxy, a massive collection of stars, dust, and clouds of gas. The Milky Way contains hundreds of billions of stars. It is only one of billions of galaxies in the universe.

The sun is one of the stars in the Milky Way. Therefore, Earth and all the other planets in the solar system are also in the Milky Way. Just as the planets revolve around the sun, the stars in the Milky Way revolve around its nucleus, or center. It takes the sun about 200 million years to travel around the nucleus of the Milky Way.

Viewed from above, the Milky Way looks like a giant pinwheel. The stars are gathered in the flat shape of a disk, and arms of stars spiral out from the nucleus. The nucleus is a bulging cluster of stars. It has a black hole at the center. A black hole is an area with such a strong force of gravity that nothing, not even light, can escape from it.

The sun and its planets are located on the inner edge of one of the Milky Way's arms. The solar system is about 30,000 light-years away from the center of the galaxy. (A light-year is the distance that light travels in one year—about 5.8 trillion miles, or 9.5 trillion kilometers.) The whole galaxy is about 100,000 light-years across.

► More to explore

Galaxy • Solar System • Star • Universe

Millet

Millet is a grain that is an important food in Asia, Russia, and western Africa. Like corn, wheat, and other grains, millet has seeds that can be eaten. Millet belongs to the grass family.

Did You Know?

The black hole at the center of the Milky Way has as much matter as 4 million suns.



People eat the seeds, or grain, of millet plants. Tiny flowers at the tops of the plants produce the seeds.

Millet was probably first grown as a crop in Asia or Africa more than 4,000 years ago. Today India and Nigeria are leading millet-producing countries.

There are several types of millet, including pearl, proso, and foxtail. Most types grow from 1 to 4 feet (0.3 to 1.2 meters) tall and have thin stalks. Pearl millet is an exception. It grows to 10 feet (3 meters) tall and has stalks about 1 inch (2.5 centimeters) thick. Tiny groups of flowers grow at the tops of millet stalks. They produce the seeds, or grain.

People eat millet in porridge, a soft, thick food made by boiling grains in milk or water. Millet can also be prepared and eaten much like rice. People also grind millet into flour for making flatbread. Farmers use millet as food for livestock. Dried millet plants are used for hay. Millet is used in birdseed mixtures, too.

► More to explore

Grain • Grass

Millipede

► see Centipede and Millipede.

Mimicry

Mimicry takes place when one living thing resembles another kind of living thing. Mimicry helps animals and plants in various ways. It can keep them from being eaten or it can help them get food.

Forms of Mimicry

Mimicry helps protect some types of butterfly in Brazil from birds. These butterflies taste good to birds. However, they have markings similar to those of bad-tasting butterflies. Birds see these markings and stay away.

Sometimes different types of dangerous or bad-tasting living things look like



The fly orchid is a type of plant whose flower looks like a fly. This helps the plant attract real flies to pollinate it.

each other. Sand wasps and yellow jackets are different types of insect. But they look similar, and they both have a painful sting. After an animal attacks one of these insects, it may learn to avoid all similar-looking insects. For this reason, many different stinging insects have yellow and black stripes.

Some animals use mimicry to prey on other creatures. The tongue of the alligator snapping turtle looks like a worm. The turtle lies in water with its mouth open. When fish come over to get the “worm,” the turtle eats them.

Animals may also use mimicry to take advantage of other animals. The eggs of the European cuckoo bird look like the eggs of other birds. A female cuckoo lays her eggs in the nests of these other birds. When the eggs hatch, the other birds care for the young cuckoos.

Plants can use mimicry, too. Passionflower plants sometimes grow little lumps that look like butterfly eggs. These lumps keep butterflies from laying actual eggs on the plants. In this way, the passionflower avoids being eaten by the caterpillars that would develop from the eggs.

How Mimicry Happens

In any group of animals or plants, only some survive and reproduce. Mimicry is a trait that makes survival easier. Therefore, many of those that have such traits do survive, and the traits are passed on to their offspring. After many genera-

tions, the entire population has the useful trait.

► More to explore

Protective Coloration

Mineral



Salt is a common mineral. Salt can be gathered from salt flats, or dried-up lakes where salt has been left behind.

Minerals make up Earth’s rocks, sands, and soils. They are found on Earth’s surface as well as deep underground.

Minerals are inorganic substances, meaning that they do not come from an animal or a plant.

Mineralogy is the science of minerals. Mineralogists, or people who study minerals, have identified about 1,500 minerals. Some of the most common minerals are metals—for example, gold, silver, copper, and platinum. Diamond, quartz, sulfur, mica, talc, and salt are other well-known minerals.


Properties of Minerals

Mineralogists use three main properties to identify a mineral: color, hardness, and cleavage. They may also use other

tests, including how the mineral reacts to electricity or magnets.

Minerals come in many different colors. They also reflect light in different ways. Some are transparent, or see-through. Others are iridescent, which means that their color changes as light hits them from different directions.

Mineralogists describe a mineral’s hardness with the Mohs scale. The scale lists 10 typical minerals, from the softest (talc) to the hardest (diamond). A mineral can be identified by comparing its hardness to the hardness of these 10 minerals.

Mohs Hardness Scale		
	Hardness	Mineral
	1	talc
	2	gypsum
	3	calcite
	4	fluorite
	5	apatite
	6	orthoclase
	7	quartz
	8	topaz
	9	corundum
	10	diamond
Example: A certain mineral can be scratched by topaz but not by quartz. Therefore, it is softer than topaz and harder than quartz. It has a Mohs hardness of between 7 and 8.		

The cleavage of a mineral is the way it splits or breaks. Mica, for example, breaks into thin, flat sheets.

Uses

Animals and plants need minerals to live. For example, humans need the mineral calcium to develop healthy

bones and teeth. Animals, including humans, get minerals from plants or from the milk, eggs, and meat of plant-eating animals. Most plants get the minerals they need from soil.

People also use minerals to make buildings, machines, tools, cleaning products, cosmetics, jewelry, and many other items. Digging useful minerals out of the ground is called mining.

► **More to explore**
Metal • Mining • Rock • Sand • Soil

Minerva

► see Athena.

Mining

Earth’s crust contains many minerals and other materials that are useful to people. To get these valuable natural resources, people must dig into the ground. The holes that they dig are called mines. Some mines are narrow shafts, or tunnels, that go very deep underground. Other mines are large open pits, like canyons. The people who work in mines are called miners.

People dig mines to get such things as diamonds, coal, silver, salt, and many other materials. When a mine provides stone for building, it is called a quarry. Drilling into Earth for petroleum, or oil, is another special type of mining. In this case, the hole in the ground is called a well, not a mine.



Miners drill for gold in a mine in South Africa.

Making Mines

There are many ways to make a mine. One way is by digging underground tunnels. Another way is by removing top layers of soil and rock to create a pit.

Tunnel mines can stretch for miles underground. Sometimes the tunnels open into large rooms. Miners who work deep underground in these rooms use large machines to dig away at the walls. Fresh air, water, and electricity must be lowered down to them from aboveground.

Workers use large earth-moving machines to make pit mines. The machines scrape and dig at the soil until they uncover the minerals. As the machines dig deeper and deeper, they create a huge hole in the ground.

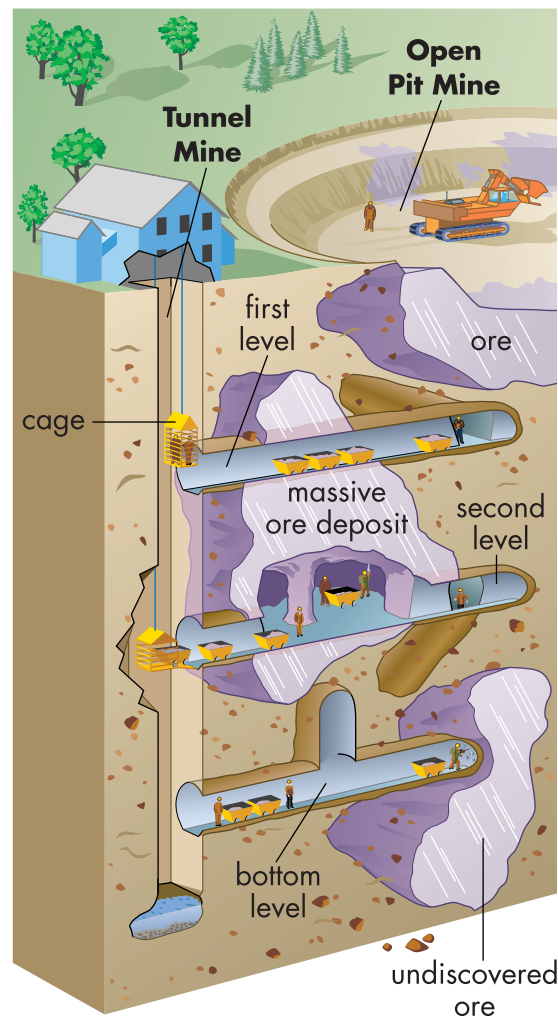
Sometimes miners must use explosives, such as dynamite, to create tunnels or to break up Earth's hard surface. These explosions also break the materials into smaller pieces so that they are easier to collect.

Dangers of Mining

Mining is dangerous work. Tunnel mines can cave in or quickly flood with water. When such disasters happen, miners may be trapped belowground. The explosions used in mining can also release poisonous gases.

History

People have dug mines since prehistoric times. Hundreds of thousands of years ago, during the Stone Age, people dug in the ground to search for flint. Flint is



Miners may go into underground tunnels to dig for ore (rock containing valuable minerals). Or they may dig ore out of large pits in the ground.

Did You Know?

The world's worst mining disaster happened in China in 1942. More than 1,500 miners died.

a stone that can be used to make weapons and tools.

The first metal to be mined was copper. The oldest copper mines are in Egypt. Ancient Egyptians dug these mines about 7,000 years ago. By 5,000 years ago, people were also mining tin and combining it with copper to create bronze. This metal was important for making sturdy, long-lasting weapons and tools. Later peoples mined iron to make even stronger tools and weapons.

The ancient Greeks mined (quarried) marble for many beautiful buildings. The ancient Romans had huge mining operations, many in lands that they conquered. During the 1400s and 1500s the Spanish grew rich by mining gold and silver in the Americas.

The first mining operations in what is now the United States started in the 1700s. Meanwhile, in Great Britain coal mining helped to start the Industrial Revolution. This was a time when people began to use machines to make goods in factories. Coal was an important source of power for operating the machines.

In the 1900s many countries worked to make mining safer for miners. Today many people are concerned about pollution and other damage to the environment caused by mining.

► More to explore

Bronze • Coal • Iron • Mineral
• Petroleum • Quarrying

Mink

Mink are mammals with thick, soft fur. People sometimes use the fur to make coats. There are two species, or types, of mink: the European mink and the North American mink. They are related to weasels.

Mink have a slim, long body; a short tail; and short legs. The body of the North American mink is 12 to 20 inches (30 to 50 centimeters) long. Its tail is 5 to 9 inches (13 to 23 centimeters) long. Adults may weigh up to 3.5 pounds (1.6 kilograms). The European mink is smaller. Its body and tail together are about 12 to 15 inches (30 to 38 centimeters) long. Mink fur is normally brown.

Mink live near water. They swim and dive well. Mink are active mostly at night. They hunt fishes, birds, insects, and small mammals. Coyotes, foxes, wolves, and owls eat mink. When a mink feels threatened, it gives off a bad smell.

► More to explore

Fur Trade • Mammal • Weasel



The North American mink lives in forests in the United States and Canada.

Minnesota



The U.S. state of Minnesota is sometimes called the Land of 10,000 Lakes. This number is low, however: the state actually has more than 15,000 lakes. These lakes—along with forests, prairies, and a variety of wildlife—make Minnesota a place of great natural beauty.

Minnesota was named after the Minnesota River. The river got its name from a Dakota Sioux Indian word meaning “sky-tinted waters.” The state capital is Saint Paul.

Geography

Located in the north-central part of the United States, Minnesota shares an international border with Canada. The state’s northern border is shaped by the Canadian provinces of Manitoba and Ontario. Minnesota’s other borders are

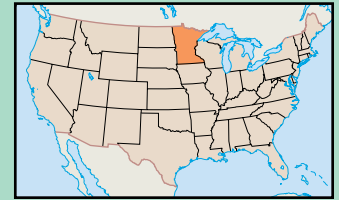
Lake Superior and Wisconsin on the east, Iowa on the south, and South Dakota and North Dakota on the west.

The Red River of the North flows along the North Dakota–Minnesota border, and the Rainy River separates the state from Ontario. The Saint Croix and Mississippi rivers separate Minnesota from Wisconsin.

Minnesota has two natural regions. The larger region covers the western and central parts of the state. The area contains thousands of lakes and the flat plains of the Red River valley. East of the valley are forests and rolling hills. The other natural region is in northeast Minnesota. This is a forested area of lakes, peat bogs, and ridges. Minnesota is known for its cold winters.



Minneapolis lies along the Mississippi River. It is the largest city in the U.S. state of Minnesota. Minneapolis and the nearby city of Saint Paul form one large urban area.



Facts About MINNESOTA

Flag



Population

(2000 census)
4,919,479—
rank, 21st state;
(2008 estimate)
5,220,393—
rank, 21st state

Capital

Saint Paul

Area

86,939 sq mi
(225,171 sq
km)—rank, 12th
state

Statehood

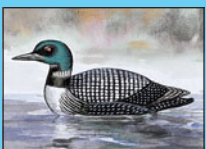
May 11, 1858

Motto

L'Étoile du Nord
(The Star of the
North)

State bird

Common loon



State flower

Pink-and-white
lady's slipper



People

Whites of European descent account for about 90 percent of Minnesota's population. When the first European explorers arrived in the 1600s, they encountered tribes of Dakota and Ojibwa (or Chippewa) Indians. In the mid-1800s, settlers arrived from the eastern United States. Later settlers included immigrants from Norway, Sweden, Finland, and other countries.

African Americans, Hispanics, and Asians each represent about 3 percent of the total population. The state's Native American population (mostly Ojibwa) numbers about 55,000.

Economy

Cropland and pastures occupy nearly half of Minnesota's total land area. The primary agricultural products are corn, soybeans, wheat, and dairy products. Food processing industries pack meat and process dairy products. The manufacture of metal products, machinery, and high-technology equipment are also valuable industries. The Minnesota Mining & Manufacturing Company (also called 3M) is well known for office products such as adhesive tape and notepads.

History

Until the mid-1800s the Ojibwa lived in the north and east of what is now Minnesota. The Dakota lived in the south and west. In the late 1600s, French explorers entered Minnesota. After the French and Indian War (1754–63), Britain gained control of the area. This land



Camping, fishing, and canoeing are popular activities in Minnesota's Boundary Waters Canoe Area Wilderness.

became part of the United States in 1783. Another part of what would later become Minnesota was acquired in the Louisiana Purchase (1803).

Congress created the Minnesota Territory in 1849, and in 1858 the territory joined the Union as its 32nd state. In 1862 the Dakota in the Minnesota River valley began one of the bloodiest Indian wars in U.S. history. The Dakota were defeated and forced to move westward. Settlers poured into Minnesota after the American Civil War (1861–65).

After World War II (1939–45), new industries based on minerals were developed. In the late 20th century Saint Paul, Minneapolis, and Duluth took steps to make their city centers more attractive to people and businesses. These cities became experiments in successful city planning and living.

► More to explore

Saint Paul • Sioux

Minoan Civilization

► see Aegean Civilization.

Minsk



Population
(2005 estimate)
1,765,800

Minsk is the capital of Belarus, a country in eastern Europe. It is the largest city in Belarus. It is also a center of culture, education, and scientific research.

Industry is very important to the economy of Minsk. Some factories in the city make trucks, tractors, refrigerators, and other machines. Other factories make electronics, clothing, and food products. Construction also brings money to the city.

Many times in its history Minsk suffered from wars. Lithuania ruled the city in the 1300s. Poland ruled it in a later period. The Russian Empire took control of Minsk in 1793.

In the early 1900s Minsk and the rest of Belarus became part of the Soviet Union. Minsk became the capital of its region. German forces captured the city in the 1940s, during World War II.



An Eastern Orthodox priest blesses people during the Christian holiday of Palm Sunday at a church in Minsk, Belarus.

Fighting nearly destroyed Minsk, but it was later rebuilt.

In 1991 Belarus became an independent country. Minsk became its capital.

► More to explore

Belarus

Minuteman

The minutemen were groups of eager young militiamen in Great Britain's American Colonies. A militia is an organized group of citizens who defend a community. The militias of the American Colonies were almost as old as the colonies themselves.

In 1774, as American colonists prepared for war, Worcester County, Massachusetts, reorganized its militia. Some of the militia members were told to be ready to fight "at a minute's notice." They were



A statue in Lexington, Massachusetts, honors the minutemen who fought against the British in 1775.

the first militiamen to be called minutemen. Counties all over Massachusetts soon formed minutemen units.

Paul Revere rode through the Massachusetts countryside on April 18, 1775, to warn the minutemen that British troops were coming. The next morning, when the British attacked, the minutemen of Lexington were ready. They forced the British to flee.

The American Revolution had begun. As the war continued, minutemen units were established in other colonies, including Maryland, New Hampshire, and Connecticut.

► **More to explore**

American Revolution • Revere, Paul

Mirage

A mirage is an image that looks real but is not really there. It is caused by layers

of air being at different temperatures and thicknesses. The differences in the layers of air can bend light. This bending, known as refraction, creates false images that people often believe truly exist.

Many mirages are seen around water or hot, flat surfaces. For example, ships may seem to be sailing upside down above the horizon. One of the most common examples of a mirage happens on highways during the summer. A shallow pool of water often seems to be filling the road ahead. The reason for this false image is that a thin layer of heated air forms above the hot black pavement. This hot air meets the cooler air above, and light is bent, or refracted, where they meet. Light refracted from the blue sky looks like water on the ground. The “water” disappears as the observer approaches. A mirage similar to this one can lead people to think they are seeing a pool of water in the middle of a desert.



A mirage in the desert of Namibia leads people to see a pool of water that is not really there.

► **More to explore**

Desert • Light

Mirror



Toddlers enjoy studying their reflection in mirrors.

A mirror is a smooth surface that shows images of the objects near it. Most mirrors are a sheet of glass with a shiny metallic coating on the back.

Reflection

The appearance of an image in a mirror is called a reflection. Reflection happens when light hits a surface. If the light cannot pass through the surface, it bounces off, or reflects. Most surfaces absorb some light and reflect some light. Mirrors, however, reflect almost all the light that hits them. The metallic coating on the back causes the reflection.

When you stand in front of a mirror, your body reflects patterns of light to the mirror. Those patterns of light bounce off the mirror and go back to your eyes. Your brain then interprets, or reads, the patterns of light as an image of yourself in the mirror.

Types of Mirrors

Most mirrors are flat. They are called plane mirrors. Images in a plane mirror are reversed. For example, if you raise your right hand while looking in a mirror, you will appear to raise your left hand. People use plane mirrors to check their appearance.

Other mirrors are curved. Convex mirrors curve outward, like a dome. They make objects appear reversed and smaller than their actual size. Concave mirrors curve inward, like a bowl. At a distance, they make objects appear upside down. Nearby, however, objects appear right side up and larger than their actual size.

How Mirrors Are Made

Mirrors are made in factories with special machinery. First, a sheet of glass is polished smooth and cleaned. Next, the back of the glass is covered with a thin layer of silver, aluminum, or another metal. Then the metal is covered with copper, varnish, or paint to protect it from scratches.

► More to explore

Glass • Light • Metal

Missions, Spanish

Spanish missions were religious communities in North America. They were set up by missionaries from Spain during the 1500s to the 1800s. Missionaries are people who try to spread their religion.

Did You Know?

Only a few animals, such as chimpanzees, can figure out that their reflection in a mirror is not another animal.

The Spanish missionaries wanted to get Native Americans to practice Roman Catholicism (a branch of Christianity practiced in Spain).

The Spanish built missions in what are now Florida, Texas, and other parts of the U.S. Southwest. Beginning in 1769, they built 21 missions in what is now California. The Spanish priest Junípero Serra set up the first California mission at the Spanish settlement of San Diego.

The typical California mission was a large, square area enclosed by stone walls. A mission’s church rose high above the walls. Its giant bells signaled people to work or to pray.

Many Native Americans lived in or around the missions. Some converted to Catholicism. They tended crops and did other work for the missions. But other Native Americans refused to convert. Some fought the Spanish. Many died from diseases brought by the Spanish.

Mexico (which included California) won independence from Spain in 1821. Mexico ended the mission system and promised to give part of the mission lands to Native Americans. However, ranchers and other Mexicans took over many of the lands.

► **More to explore**
Americas, Exploration and Settlement of the • California • Native Americans

California Mission	Present Location	Year Founded
San Diego de Alcalá	San Diego	1769
San Carlos Borroméo	Carmel*	1770
San Antonio de Padua	Jolon	1771
San Gabriel Arcángel	San Gabriel	1771
San Luis Obispo de Tolosa	San Luis Obispo	1772
San Francisco de Asís	San Francisco	1776
San Juan Capistrano	San Juan Capistrano	1776
Santa Clara de Asís	Santa Clara	1777
San Buenaventura	Ventura	1782
Santa Barbara	Santa Barbara	1786
La Purísima Concepción	Lompoc	1787
Santa Cruz	Santa Cruz	1791
Nuestra Señora de la Soledad	Soledad	1791
San José	Fremont	1797
San Juan Bautista	San Juan Bautista	1797
San Miguel Arcángel	San Miguel	1797
San Fernando Rey de España	Mission Hills	1797
San Luis Rey de Francia	Oceanside	1798
Santa Inés	Solvang	1804
San Rafael Arcángel	San Rafael	1817
San Francisco Solano	Sonoma	1823
*originally founded in Monterey in 1770 but moved to Carmel in 1771		

The Spanish built 21 missions in what is now the U.S. state of California.

Mississippi



The U.S. state of Mississippi got its name from a Native American word meaning “great waters” or “father of waters.” The water described is the great Mississippi River, which forms the state’s western border. Mississippi’s nickname is the Magnolia State. The capital is Jackson.

Geography

Mississippi is located in the southeastern United States. The Mississippi River separates western Mississippi from Louisiana and Arkansas. Louisiana also borders Mississippi on the southwest. To the east is Alabama and to the north is Tennessee. The Gulf of Mexico lies to the southeast.



Mississippi is a low and fairly flat state. It has two major natural regions: the Mississippi floodplain and the coastal plain. The Mississippi floodplain, along the western edge of the state, was built up by silt carried downstream by the Mississippi River. The coastal plain covers most of the state and consists of smaller regions of hills and plains.

People

Early settlers in Mississippi were French and Spanish. In the late 1700s and early 1800s the region was populated by English, Irish, and Scottish settlers. Today whites of European descent make up about three fifths of the population. About one third of the people are African Americans. Hispanic Americans, Asians, and Native Americans make up smaller groups.

Economy

Mississippi’s soil and climate are well suited for farming. Cotton and soybeans



A riverboat travels along the Mississippi River near Natchez, Mississippi.

Facts About MISSISSIPPI

Flag



Population

(2000 census)
2,844,658—
rank, 31st state;
(2008 estimate)
2,938,618—
rank, 31st state

Capital

Jackson

Area

48,430 sq mi
(125,434 sq
km)—rank, 32nd
state

Statehood

December 10,
1817

Motto

Virtute et Armis
(By Valor and
Arms)

State bird

Mockingbird



State flower

Magnolia



are primary crops. Chickens and cattle are the most important livestock. Shrimp and catfish are valuable. The shrimp are caught in the gulf, but most of the catfish are raised in artificial ponds. The state's many forests provide trees for wood products such as lumber and furniture. Other major areas in Mississippi's economy include government operations, social services, commercial trade, banking, real estate, construction, and trucking.

History

The Choctaw were the largest Native American tribe living in the Mississippi area before Europeans arrived. Spanish explorer Hernando de Soto visited the region in 1540. In 1682 the French explorer Sieur de La Salle claimed the territory for France. The first permanent European settlement was built in 1699.

By 1812 the United States had obtained all of the land that forms present-day Mississippi. Mississippi joined the Union as the 20th state in 1817. The years after 1820 were marked by the creation of the cotton plantation system. This consisted of large farms called plantations that depended on slave labor to keep operating. In 1861 Mississippi withdrew from the Union because its leaders were afraid the government would outlaw slavery. Mississippi joined other Southern states in forming the Confederate States of America.

The American Civil War (1861–65) turned Mississippi into a battlefield. One of the state's harshest battles was



A home built in the 1800s (right) and a Presbyterian church stand side by side in Biloxi, Mississippi.

fought at Vicksburg in 1863. After the Confederacy's defeat, Mississippi was readmitted to the United States in 1870.

Like many other states, Mississippi experienced racial problems. Despite the end of slavery, African American residents were denied some of the opportunities available to whites. The civil rights movement of the 1960s made an impact on Mississippi and helped to change the way African Americans were treated.

New industries developed in Mississippi during the last quarter of the 20th century. The state made significant economic progress in the 1990s. Average incomes grew and the poverty level dropped. Nevertheless, Mississippi remained one of the poorest states in the nation in the early 21st century.

► More to explore

American Civil War • Civil Rights Movement • Jackson

Mississippian Culture

In about AD 800 groups of Native Americans developed a culture along the Mississippi River and in what is now the southeastern United States. This Mississippian culture is best known for building mounds of earth. The culture ended by about 1700, but many of the mounds still stand.

The Mississippians lived in both large and small communities. Chiefs ruled towns or regions, called chiefdoms. The chiefs were also religious leaders. Chiefdoms had contact with each other through wars, trade, and alliances.

The people were mainly farmers who grew corn and other crops. They also produced pottery and detailed carvings. They used stone, shell, wood, and copper to make headdresses, masks, weapons, and other items.

Every Mississippian chiefdom had one or more mounds of earth, usually at the center of town. Some mounds were small and round. Others were large pyramids or platforms. The chief's home always sat at the top of a mound.

The largest Mississippian mound is Monks Mound, which is a part of the Cahokia Mounds in southern Illinois. Monks Mound measures about 1,000 feet (300 meters) long and 700 feet (200 meters) wide. It stands about 100 feet (30 meters) high.



Mississippians made gorgets, or jewelry that hangs around the neck, from shell.

The Mississippian culture had already begun to weaken when European explorers arrived in the 1500s. Many Mississippians then died of diseases brought by the Europeans. The last people of the Mississippian culture were probably the Natchez.

► More to explore

Mound Builder • Natchez • Native Americans

Mississippi River

The Mississippi is North America's longest river. Native Americans gave the Mississippi its name, which means "father of waters." The writings of Mark Twain have made the river a part of U.S. legend.

Geography

The Mississippi River begins at Lake Itasca in northern Minnesota and flows south, passing Saint Paul, Minnesota. Near Saint Louis, Missouri, the Missis-



issippi is joined by the muddy Missouri River. Farther along, at Cairo, Illinois, the Mississippi meets the mighty Ohio River. The Mississippi flows into the Gulf of Mexico near New Orleans, Louisiana.

The Mississippi River alone is 2,350 miles (3,780 kilometers) long. If the length of the Missouri River system is added, the Mississippi flows for 3,710 miles (5,971 kilometers). By that measure, the Mississippi is the world's fourth longest river.

Animals

Millions of ducks, geese, and swans move along the Mississippi during their spring and autumn migrations. The path they follow is called the Mississippi Flyway. Common fish in the river include catfish, walleye, and carp.

Economy

The Mississippi River has a long history of trade. Today it is one of the busiest commercial water routes in the world. Products shipped on the river include oil, coal, iron, steel, chemicals, and grain from Midwestern farms.



A tugboat pushes barges on the Mississippi River in Louisiana. Barges are boats that carry goods along rivers and other waterways.

History

The first European to explore the Mississippi was Hernando de Soto of Spain. He entered the river from the Gulf of Mexico in 1541. The French explorers Jacques Marquette and Louis Jolliet traveled part of the way down the river in 1673. Another French explorer, La Salle, reached the mouth in 1682. He claimed the entire Mississippi region for France. In 1803 France sold the land to the United States in the Louisiana Purchase.

► More to explore

Louisiana Purchase • Missouri River
• Ohio River • Twain, Mark

Missouri

The Missouri were a Native American people whose homeland was the north-central part of what is now the state of Missouri. The state takes its name from these people.

The Missouri got their food by farming, hunting, and gathering wild plants. After the fall harvest they left their villages to hunt deer. When they were introduced to horses the Missouri used them to travel to the Great Plains to hunt bison (buffalo).

The Missouri were once part of a large Native American group called the Winnebago who lived in the Great Lakes region. Long ago a group of these Indians moved southwest and split into three tribes. These were the Oto, the Iowa, and the Missouri.



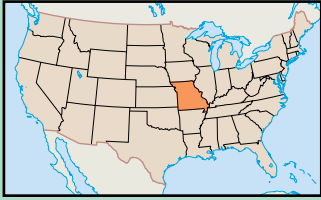
Leaders of the Missouri people wore necklaces made from beads and bear claws.

In 1673 French explorers entered the lands of the Missouri. The Missouri became trading partners of the French. In the late 1700s and early 1800s, wars with other tribes caused the Missouri to scatter. Many settled among their Oto and Iowa relatives.

In 1817 and 1854 the U.S. government forced the Missouri and the Oto to sign agreements to give up most of their land. In the 1880s they were forced to move to a reservation in Indian Territory (now Oklahoma). There they became known as the Otoe-Missouria Tribe of Oklahoma. By the end of the 20th century there were about 1,500 Otoe-Missouria in the United States.

► More to explore

Iowa • Native Americans • Oto
• Winnebago



Missouri

The U.S. state of Missouri got its name from a Native American tribe that once lived in the area. The French gave the name to the local river, and it was later transferred to the state.

Missouri is often called the Show Me State. The nickname probably came from Congressman Willard D. Vandiver. In an 1899 speech he said, “I’m from Missouri, and you’ve got to show me.” The state capital is Jefferson City.

Geography

Missouri is nearly in the center of the United States. Eight states border Missouri: Iowa on the north; Nebraska, Kansas, and Oklahoma on the west; Arkansas on the south; and Tennessee, Kentucky, and Illinois on the east. The Missouri River forms the northwest boundary, while the Mississippi River runs along the eastern border.



Saint Louis, Missouri, is famous for its Gateway Arch. The arch was built in the early 1960s. It is a monument to the people who used Saint Louis as a starting point for exploring and settling the western United States.

North of the Missouri River, the state’s landscape consists of gently rolling hills, open plains, and prairie country. South of the river the land is mostly rough and hilly. The state’s southeastern corner is part of the Mississippi River floodplain.

People

White people of European heritage now make up more than four fifths of Missouri’s population. Many early settlers in the state were from the eastern United States. Others were immigrants from European countries such as Germany, Great Britain, and France. About 11 percent of the current population is African American.

Economy

Missouri is known as a manufacturing state. Major manufacturing areas include transportation equipment and food processing. Cars, trucks, and airplanes are all built in the state. Hallmark Cards, the company that creates greeting cards, has its headquarters in Kansas City. Service industries such as government operations, real estate, commercial trade, health care, and finance are vital to the state's economy. Leading agricultural products are cattle, hogs, soybeans, and corn.

History

Native Americans of the Fox, Sauk, Missouri, and Osage tribes lived in the area when European explorers first arrived. In 1682 the French explorer called the Sieur de La Salle claimed the area for France. The first permanent white settlement was established in 1735.

In 1803 the United States purchased a large area from France. It was known as the Louisiana Purchase. The region that is now the state of Missouri was part of that area. In 1804 the city of Saint Louis was the starting point of the famous Lewis

and Clark Expedition. The expedition was sent out to explore the area of the Louisiana Purchase. Missouri became a territory in 1812 and a state in 1821.

When Missouri wanted to become a state it faced a problem because of the issue of slavery. People in the territory owned slaves. Therefore Missouri would be a slave state. Some people in the United States Congress did not want Missouri to become a state because there were an even number of slave and free states at the time. The problem was solved by a law known as the Missouri Compromise. The compromise was this: Missouri would join the Union as a slave state and Maine would enter as a free state.

Although Missouri was a slave state, it did not join the Confederacy with other slave states during the American Civil War (1861–65). Federal troops were brought in to make sure that Missouri remained in the Union.

In 1904 the state hosted a world's fair called the Louisiana Purchase Exposition. It marked the hundredth anniversary of the purchase. The state remained mostly rural until the early 1940s. During World War II (1939–45) manufacturing grew in the state. This led many people to leave farms and towns for cities. Gradually, manufacturing and service industries became the most important parts of Missouri's economy.

► More to explore

American Civil War • Jefferson City
• Lewis and Clark Expedition • Missouri Compromise

Facts About MISSOURI

Flag



Population

(2000 census)
5,595,211—
rank, 17th state;
(2008 estimate)
5,911,605—
rank, 18th state

Capital

Jefferson City

Area

69,704 sq mi
(180,533 sq
km)—rank, 21st
state

Statehood

August 10, 1821

Motto

*Salus Populi
Suprema Lex Esto*
(The Welfare of
the People Shall
Be the Supreme
Law)

State bird

Bluebird



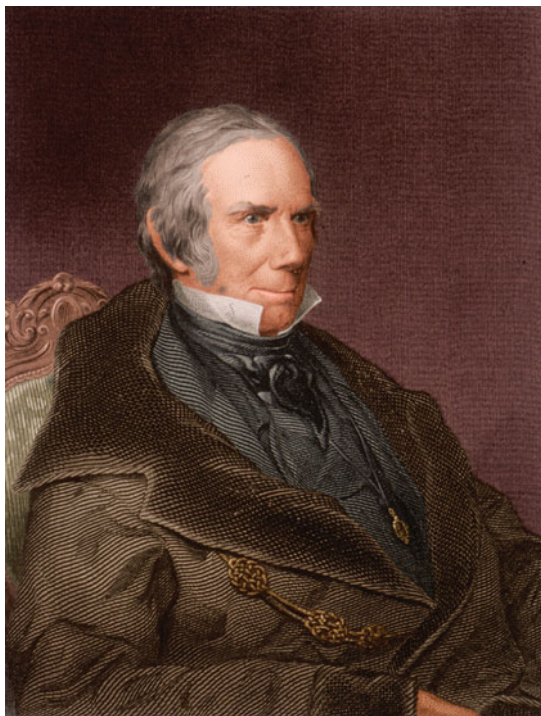
State flower

Hawthorn



The Missouri River winds through the countryside near Saint Albans, Missouri.

Missouri Compromise



Congressman Henry Clay came up with the idea for the Missouri Compromise.

The Missouri Compromise was an agreement passed by the U.S. Congress in 1820. It allowed Missouri to become the 24th state in the United States. It also began the conflict over the spread of slavery that led to the American Civil War (1861–65).

In the early 1800s Missouri was still a territory. In 1818 it applied to Congress to become a state. At that time there were 11 free states and 11 slave states in the United States. The admission of Missouri as a slave state would upset the balance of states.

In 1819 Maine also applied to be a state. Henry Clay, a member of Congress

from Kentucky, then came up with a compromise. Congress agreed to admit Maine as a free state and Missouri as a slave state. The compromise also banned slavery from any future territories or states north of the southern border of Missouri.

The Missouri Compromise stayed in effect for more than 30 years. It was broken by the Kansas-Nebraska Act of 1854, which allowed slavery north of the Missouri Compromise line.

► More to explore

American Civil War • Kansas-Nebraska Act • Slavery

Missouri River

The Missouri River flows for 2,315 miles (3,726 kilometers) through the central United States. It is nearly as long as the Mississippi River, which it joins at its mouth. Together the Missouri and the Mississippi form a river system that is 3,710 miles (5,971 kilometers) long. Only three rivers in the world are longer.

The Missouri River begins in the Rocky Mountains of southwestern Montana. It





The Missouri River winds through a canyon in Montana.

first flows north and then turns eastward. It passes through or along the borders of North Dakota, South Dakota, Nebraska, Iowa, Kansas, and Missouri. It meets the Mississippi River just north of Saint Louis, Missouri.

The Missouri once carried a huge amount of soil all through its course. It was called the Big Muddy because of its brown water. Today, however, dams trap much of the soil in the upper part of the river. The lower part of the river is cleaner.

Barges pushed by tugboats move cargo on the Missouri River between Sioux City, Iowa, and the river's mouth. Dams keep barge traffic from going farther north than Sioux City. The barges carry corn, soybeans, and wheat from farms in the area.

The first Europeans to see the mouth of the Missouri were the French explorers Jacques Marquette and Louis Jolliet, in 1673. French fur traders traveled upstream in the 1700s. The United

States bought almost all the land drained by the Missouri from France in 1803. The U.S. explorers Meriwether Lewis and William Clark traveled up and down the river during their famous expedition of 1804–06.

► More to explore

Jolliet, Louis • Lewis and Clark Expedition • Marquette, Jacques • Mississippi River

Miwok

The Native Americans known as the Miwok (or Mewuk) traditionally lived in central California. There were several different groups of Miwok. The largest group was the Sierra Miwok, who lived in the western foothills of the Sierra Nevada mountains. The Sierra Miwok had more than 100 villages when Europeans arrived in their territory.

The Miwok lived in large, earth-covered houses. Some Miwok also made simple shelters called lean-tos from bark. The Miwok fished and hunted birds, deer,



A Southern Miwok woman holds up a sifting basket in about 1924.

and other game with bows and arrows. They also gathered nuts, berries, and roots.

By the early 1800s Spanish priests and soldiers had started to build missions in Miwok territory. The Spanish forced some Miwok to live and work at the missions. In addition, Russian traders who came from the north sometimes attacked the Miwok.

In 1848 gold was discovered in California. Gold-seeking Americans rushed to California and took over Miwok lands. The settlers killed many Miwok.

The surviving Miwok scattered. Without land, many gave up their old way of life. They moved from place to place looking for work, often on farms or ranches. At the end of the 20th century there were about 3,000 Miwok.

► More to explore

Missions, Spanish • Native Americans

Mockingbird

Mockingbirds are songbirds known for imitating the songs of other birds. The common, or northern, mockingbird may learn the songs of more than 30 other kinds of birds. It may also imitate such sounds as the cackling of a hen or the barking of a dog. Mockingbirds sing their own musical songs, too.

Mockingbirds live in bushy areas and suburbs in the Americas. The common mockingbird is found in the United States and Mexico. The blue mocking-



A common mockingbird perches on a cactus in the U.S. state of Texas.

bird lives in Mexico. Several other species, or types, of mockingbird live in Central and South America.

Mockingbirds are medium-sized birds with slim bodies and long tails. They are mostly gray or brownish. Common mockingbirds are about 10.5 inches (27 centimeters) long.

The bill of a mockingbird is strong and slender, with a slight downward curve. Mockingbirds use their bills to eat insects, seeds, and berries.

Mockingbirds strongly defend their territory. In fact, many types will attack dogs, cats, or even humans whom they see as a threat.

► More to explore

Bird • Songbird

Did You Know?

Like the nightingale (another bird that is famous for its singing), the mockingbird often sings at night.

Modoc

► see Klamath and Modoc.

Mogadishu



Mogadishu is the capital of Somalia, a country in northeastern Africa. It is the country's largest city. It is also a major port on the Indian Ocean. Mogadishu is an ancient city that enjoyed wealth and power long ago. But it was seriously damaged during a civil war in the late 20th and early 21st centuries. The war also hurt the city's economy.

Arab settlers founded Mogadishu in the 900s. It grew into a wealthy trading city.

In the 1500s Mogadishu began to decline. Rulers from local kingdoms took control of the city.

Italy took over Mogadishu and the surrounding area in the late 1800s. The city later became the capital of the colony called Italian Somaliland.

In 1960 Somalia became an independent country with Mogadishu as its capital. Different groups began fighting for control of Somalia in the 1990s. Much of the fighting took place in Mogadishu.

► More to explore

Somalia

Mohawk

The Mohawk were one of the five original Native American tribes of the Iroquois Confederacy. The confederacy was a group of tribes that lived in upper New York State and spoke similar languages. The Mohawk originally lived in what is now the Mohawk River valley.

Like the other Iroquois tribes, the Mohawk lived in longhouses. Longhouses were large, barn-shaped homes made from wooden frames covered with bark. A longhouse was big enough to house several families. The Mohawk grew corn, beans, and squash. They fished in the summer and hunted in the fall and winter.

In the early 1600s Europeans from England and the Netherlands began arriving in Mohawk territory. The

Did You Know?

During the 1900s, Mohawk men became famous for their skill as construction workers on skyscrapers.



Despite a civil war, children still go to school in Mogadishu, Somalia.



Joseph Brant was a Mohawk chief who supported the British during the American Revolution.

Mohawk traded furs with them for metal tools, guns, and other goods. In the 1630s and 1640s smallpox and other diseases brought by the Europeans killed two thirds of the Mohawk.

During the American Revolution (1775–83) Mohawk warriors helped English troops fight the American colonists. When the Americans won the war, some Mohawk moved to Canada. In the early 21st century thousands of Mohawk people lived in the Canadian provinces of Quebec and Ontario. Others lived in the U.S. state of New York.

► More to explore

American Revolution • Iroquois
• Native Americans

Mohegan

The Mohegan are a Native American people who originally lived in what is now eastern Connecticut. When English settlers arrived in their territory the

Mohegan became friends of the settlers. Because of this the Mohegan became the most powerful tribe in southern New England in the late 1600s.

The Mohegan lived in dome-shaped homes called wigwams. They fished, farmed, and hunted. The Mohegan's most important crop was corn. They also grew beans and squash.

In the early 1600s European settlers began arriving in New England. At the time the Mohegan were under the control of Sassacus, a chief of the neighboring Pequot tribe. The Mohegan eventually rebelled against Sassacus and became independent. The leader of the rebellion was named Uncas. He made the Mohegan tribe stronger by forming an alliance with the English.

In 1637 English settlers started a war against the Pequot. Most of the Pequot were killed. The Mohegan took over most of the Pequot lands. The Mohegan



A large boulder called Cochegan Rock is important to the Mohegan people. It is thought to be where the leader Uncas held tribal councils, or meetings. It is located in the eastern part of the state of Connecticut.

grew even more powerful after the English nearly destroyed neighboring Native American tribes in King Philip's War (1675–76).

Despite their success the Mohegan population declined. Many of the Mohegan began dying of diseases brought by the Europeans, such as smallpox and measles. In addition, English settlers turned on their former allies and took the Mohegan's land. At the end of the 20th century there were only about 1,100 Mohegan living in the United States.

► More to explore

King Philip's War • Measles • Native Americans • Pequot • Smallpox

Mohican

The Mohican (or Mahican) are Native Americans who originally lived in what is now northern New York State. Their land ran along the Hudson River. Today most Mohican live in northeastern Wisconsin.

The Mohican traditionally lived in rectangular, bark-covered homes called longhouses. Longhouses were big enough for several families. Groups of longhouses made up villages. Some villages were protected by stockades, or fences of sharp stakes.

The Mohican grew corn, beans, and squash. They gathered wild plant foods, including the sweet syrup of the maple tree. They also hunted and fished.



The Mohican used stones to grind corn into meal.

Dutch traders came to Mohican lands in the early 1600s. The Dutch became allies of the Mohawk, who were enemies of the Mohican. The Mohawk got guns from the Dutch and forced the Mohican from their homeland. Many Mohican joined other tribes. One group of Mohican moved to what is now Stockbridge, Massachusetts. They became known as the Stockbridge Indians.

The Stockbridge fought with the Americans in the American Revolution (1775–83). But after the war the U.S. government let settlers take over the tribe's territory. The Stockbridge moved west. Eventually they settled in Wisconsin. There they were joined by the Munsee, a group of Delaware (Lenni Lenape) Indians. In 1856 the U.S. government gave the Stockbridge and Munsee Indians a reservation in Wisconsin. At the end of the 20th century more than 2,300 Stockbridge-Munsee lived in Wisconsin.

► More to explore

Delaware • Mohawk • Native Americans



Moldova

Moldova is a small country in eastern Europe. Its capital is Chisinau.

Geography

Moldova is in the northeastern corner of the Balkan Peninsula. Ukraine and Romania surround the country. The land is a hilly plain with rich, black soil. Moldova has warm summers and mild winters.

Plants and Animals

Forests cover northern and central Moldova. Wild boars, hares, wolves, foxes, badgers, wildcats, and deer live in the forests.

People

Moldovans make up about half of the country's population. Other groups include Ukrainians, Russians, Bulgarians, Roma (Gypsies), Gagauz (a Turkic people), and Jews.



Grapevines grow near Tiraspol, Moldova.

Economy

Agriculture is important to Moldova's struggling economy. Sugar beets, wheat, corn, grapes, sunflower seeds, and tobacco are the leading crops. Sheep, pigs, and cattle are the main livestock. Moldova's industries process many farm products, including wine, sugar, dairy products, meat, and fruit. Factories also make tractors and clothing.

History

Moldova was originally called Bessarabia. In the 1400s it joined Moldavia, a region that later became the country of Romania. In 1940 the Soviet Union took Bessarabia from Romania. It made Bessarabia the Moldavian Soviet Socialist Republic. In 1991 the republic gained independence as Moldova.

► More to explore

Balkan Peninsula • Chisinau • Romania

Facts About MOLDOVA



Population
(2008 estimate)
3,760,000

Area
13,068 sq mi
(33,845 sq km)

Capital
Chisinau

Form of government
Republic

Major cities
Chisinau, Tiraspol, Balti, Tighina



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Mole

Moles are small mammals that are known for digging tunnels. There are more than 40 species, or types, of mole. They can be found in Europe, Asia, and North America.



A mole's wide, flat front feet and sharp claws help it dig through soil.

Most moles are built for digging. Their bodies are cylindrical, or tube-shaped, and they generally have short tails. They range in length from about 1.2 inches (3 centimeters) to almost 9 inches (22.5 centimeters) without their tails. The head is flat and pointed, and the nose is long and piglike. They have hairs on their noses and tails that are very sensitive. These help to guide them through the darkness. Moles have short front legs with wide, flat feet. The feet have five toes, each with a long, sharp claw.

Moles make tunnels by “swimming” through the soil. They push their feet forward and then out to the side, moving the dirt back. Moles sometimes make two separate tunnels. Tunnels just under the ground are for feeding and resting. Some moles also dig deeper tunnels about 10 feet (3 meters) underground. These lead to the mole's home. In digging these deep tunnels, moles

push up the dirt, making little hills above ground called molehills.

Some moles spend time aboveground or in water. These include shrew moles and moles called desmans.

Moles have big appetites. Most moles eat earthworms, insects, and other foods that they find while traveling through their tunnels.

► More to explore

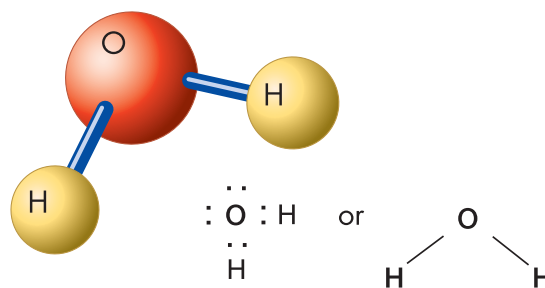
Mammal

Molecule

A molecule is the smallest unit of a substance that has all the properties of that substance. For instance, a water molecule is the smallest unit that is still water. A water molecule can be divided into tiny parts called atoms. This produces two hydrogen atoms and one oxygen atom. But these atoms alone do not have the properties of water.

Molecules and Elements

The chemical elements are the substances of which all matter is made. That is, everything in the world is



A water molecule contains two atoms of hydrogen (H) and one atom of oxygen (O). Scientists have different ways of drawing molecules to show how they are made.

Did You Know?

A molecule is constantly in motion. Its atoms rotate and vibrate around one another.

either a pure element or a combination of two or more elements. The molecules of pure elements contain only one type of atom. For example, the molecules of the element iron consist only of iron atoms.

A few elements have molecules that are made of a single atom. For instance, a molecule of helium gas consists of one helium atom. But most elements have molecules that contain at least two atoms joined together. For example, a molecule of oxygen gas consists of two oxygen atoms.

Molecules and Compounds

Other molecules contain atoms of two or more different elements. A substance made of such molecules is called a chemical compound. Water is a chemical compound because its molecules have two hydrogen atoms and one oxygen atom. The sugar called glucose is another chemical compound. Each glucose molecule contains 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms. Some very complex molecules in living cells are made up of hundreds of thousands of atoms.

How Molecules Are Formed

Strong chemical bonds hold the atoms in a molecule together. The bonds are formed when atoms share particles called electrons. Electrons are found either alone or in pairs in the outer part of atoms. When two atoms with unpaired electrons approach each other, the unpaired electrons may form a pair.

Both atoms then share the pair. This holds the atoms together.

► More to explore

Atom • Chemical Element • Chemistry
• Matter

Mollusk

A mollusk is a kind of animal with a soft body. Most mollusks have a hard shell that protects the body. There are more than 100,000 species, or types, of mollusk. Octopuses, oysters, snails, and squid are just a few examples.

Where Mollusks Live

Mollusks can be found throughout the world. Most live in the sea, but others live in freshwater. Some like shallow water along the coast. Others prefer deep water. Many mollusks dig into sandy or muddy bottoms. Some attach themselves to rocks.

Some snails and slugs live on land. They prefer cool, moist places. But they also can be found in cold regions and in dry deserts.



Squid are awake and active at night in the water.



Mussels have hard shells with two halves that can close to keep them safe.

Physical Features

Mollusks vary a lot in their features. Even mollusks of the same type can be very different. For example, the giant squid can be more than 60 feet (18 meters) long. But some other squid are less than an inch (2.5 centimeters) long.

Mollusks are invertebrates, meaning that they do not have a backbone. They have a soft body that holds the heart, liver, digestive system, and other important organs. Most mollusks have a mouth structure called a radula. The radula is sort of like a rough tongue with lots of tiny teeth.

A mollusk's soft body has a covering called the mantle. In most kinds of mollusk, the mantle makes a shell. Some mollusks, such as snails, have a single, solid shell. Other mollusks, called bivalves, have a shell with two halves that can close together for protection. Oysters and clams are bivalves. Some mollusks, such as octopuses and squid, do not have a shell.

Most mollusks with shells have a "foot." The foot moves them forward by

expanding and contracting muscles. Some bivalves, however, do not move. They stay attached to rocks or other hard surfaces. Octopuses, squid, and cuttlefish move by forcing water out of a funnel-shaped structure on their body.

Behavior

Many mollusks eat mostly algae. They use the radula to scrape algae off rocks. But larger mollusks have a greater appetite. Snails and slugs eat plants and fruit. Squid may eat fish and shrimp. An octopus can go after prey as large as a shark.

Mollusks usually are active at night. For instance, octopuses stay in the deep parts of the ocean during the day. At dawn and dusk they swim closer to the surface looking for food.

Many mollusks hide from enemies in their shells. But mollusks without shells need other ways to protect themselves. For example, squid and octopuses change color and patterns to blend into their surroundings.

Reproduction

Some mollusks bear live young, but most reproduce by laying eggs. There may be one egg, several eggs, or thousands of eggs. The babies of some mollusks look like small adults when they hatch. Others hatch in a wormlike form called larvae.

► More to explore

Bivalve • Octopus • Shell • Snail and Slug • Squid

Did You Know?

A mollusk called the giant squid is the largest living invertebrate, or animal without a backbone.



Monaco

Only one nation in the world, Vatican City, is smaller than the tiny European country of Monaco. Monaco is so small that it does not have a capital or any other separate cities. The country is a principality, which means that a prince is the ruler.

Geography

The Mediterranean Sea forms Monaco's southeastern border. France surrounds the country on all other sides. Monaco is about 5 miles (8 kilometers) west of the border between France and Italy. It lies within the coastal area called the French Riviera.

Facts About MONACO



Population
(2008 estimate)
34,300

Area
0.75 sq mi (1.95 sq km)

Capital
The principality is a single administrative unit. No separate area within it is distinguished as the capital.

Form of government
Constitutional monarchy

Buildings and roads cover almost all of the land. The Rock of Monaco is a piece of high land that sticks out into the sea. It contains the royal palace and a Roman Catholic cathedral. Palm trees, evergreen shrubs, and flowering plants grow in Monaco's gardens.

People

The citizens of Monaco are called the Monegasque. However, most of the people who live in Monaco are citizens of France or Italy. The main language is French. Roman Catholicism is the national religion.

Economy

Monaco's chief industry is tourism. Many rich tourists visit the famous gambling casino in the section of Monaco called Monte-Carlo. Tourists also enjoy



The tiny country of Monaco has a busy harbor on the Mediterranean Sea.

Monaco's beaches and harbor and the city's famous automobile races. Banking and financial services are important to the economy as well. The citizens of Monaco do not pay taxes on the money they earn.

History

The Grimaldi family from Genoa, Italy, took control of Monaco in 1297. The head of the family took the title of prince in 1659. In 1911 one of the Grimaldi princes, Albert I, gave Monaco a constitution. His great-grandson, Rainier III, married Grace Kelly, a U.S. movie star, in 1956. After Rainier III's death in 2005, his son, Albert II, became prince.

► **More to explore**
Mediterranean Sea

Monarchy

A monarchy is a form of government that has a single person known as a monarch at its head. Monarchs use such titles as king, queen, emperor, or empress. Monarchies were once common throughout the world, but now they are rare.

Monarchs generally reign for life. Also, most monarchies are hereditary. This means that when the monarch dies, a son, daughter, or other relative becomes the next monarch. However, some early monarchs were elected. Germany's Holy Roman Empire continued this tradition.

Forms of Monarchy

There are several kinds of monarchy. In an absolute monarchy, the monarch rules with unlimited power. Absolute monarchy is less common today than constitutional monarchy. A constitutional, or limited, monarchy has an elected government that runs the country. The monarch has very little power.

History

Monarchies have existed since people first started forming civilizations. In early times some peoples, such as the ancient Egyptians, saw their monarchs as godlike or as actual gods. Beginning in the 1500s many European monarchs claimed that their power came directly from God. This idea was called the divine right of kings.

By the 1700s, however, more and more citizens had come to see monarchs not



Gyanendra Bir Bikram Shah Dev sits on a special chair after becoming king of Nepal in 2001. The chairs of monarchs are often called thrones.

as divine rulers but as brutal tyrants. In 1776 the American Colonies broke away from the British monarchy. They formed a republic—a country ruled by the people. As more colonies around the world gained independence, they almost always ended up as republics and not monarchies. World War I (1914–18) brought an end to important European monarchies, including those of Russia, Germany, and Austria-Hungary.

Today monarchies survive in the United Kingdom, Spain, Sweden, The Netherlands, Morocco, Jordan, Japan, and several other countries. These are all constitutional monarchies. Stronger forms of monarchy exist in Saudi Arabia and Swaziland.

► **More to explore**
Government • Republic

Monet, Claude



Claude Monet stands beside two of his paintings.

Claude Monet was a French artist known for painting in the style called impressionism. Monet was famous during his lifetime, and his paintings remain popular today. They are on display in art museums around the world.

Claude Monet was born on November 14, 1840, in Paris, France. He drew and painted as a young man. In the 1860s he became friends with other artists, including Pierre-Auguste Renoir. The group of artists became known as the impressionists because of Monet's painting called *Impression: Sunrise*.

Most of Monet's subjects were from nature. Like other impressionists, he was fascinated by the way light and shadows change during the day. He often painted the same scene again and again to show all the variations of light and shadow.

In the 1880s Monet settled in Giverny, outside of Paris. There he painted one of his most famous series of paintings,

called *Water Lilies*. Monet died on December 5, 1926, in Giverny.

Money

Whenever people pay for goods or services, they use some form of money. Money can be almost anything, as long as everyone agrees on its value. One of the earliest forms of money was metal, such as gold or silver. In North America, Native Americans used beads made of shell, called wampum, as a form of money.

How Money Works

People used to pay for things through barter, or trading. But each trading partner had to have something that the other one wanted. And the two things had to be of equal value. Modern living would be impossible under this system.

People invented money to avoid barter. In a money system, a buyer does not



Different countries have different currencies, or kinds of money. The money of the United States is called the dollar.

have to have something that the seller happens to need. The seller will always accept payment in money, because the seller can use the same money later to buy almost anything.

Today the metal coins and pieces of paper that people use for money have little real value. In other words, people do not use the paper for writing or the metal for making tools. The value of paper money and coins comes from an agreement between all people. They agree that they will accept certain forms of money in exchange for their goods and services. This agreement between people is the reason money works.

History

People have used money for more than 4,000 years. In the 600s BC the kingdom of Lydia in what is now Turkey began to make coins. It was probably the first government to do so. These coins were a combination of silver and gold, called electrum. Many ancient peoples, including the Greeks and the Romans, also used coins.

The first types of paper money were used in China more than 1,000 years ago. Early paper money was simply a written promise to pay a certain amount of gold or silver money. The paper money was valuable because it could be traded for gold or silver. Later, governments began printing paper money. In the 1900s most governments made paper money valuable on its own. It no longer stood for gold or silver. Today

people often exchange money electronically, through computers.

► More to explore

Trade

Mongol Empire

The Mongol people were a group of tribes from the grasslands of central Asia. In the early 1200s a warrior named Genghis Khan united the tribes and built a mighty empire. At the height of its power, the empire stretched from what are now China and Korea to eastern Europe.

Genghis Khan

The Mongols' homeland lay in what are now Mongolia and northern China. Mongol tribes raised animals and moved from place to place. The tribes sometimes banded together in groups. Near the end of the 1100s, a leader named Temüjin took control of a group called All the Mongols. In 1206 he took the title of Genghis Khan, which means "universal ruler."

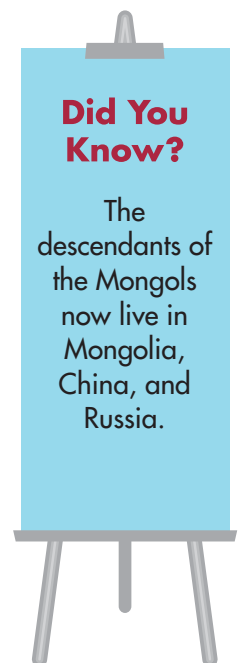
People across Asia feared Genghis Khan's armies. His soldiers rode horses and fought with bows and arrows. By 1215 the Mongols had taken northern China. When Genghis Khan died in 1227, the Mongols controlled land from the coast of China all the way to European Russia.

After Genghis Khan

Genghis Khan's sons and grandsons continued to build the empire after his

Did You Know?

The descendants of the Mongols now live in Mongolia, China, and Russia.





death. One of his grandsons, called Batu Khan, led a Mongol group called the Golden Horde. The Golden Horde moved west from Russia into Hungary.

In 1251 Möngke, another grandson of Genghis Khan, became khan, or ruler of the Mongol Empire. Möngke's armies conquered Persia (Iran) and Iraq. Only defeat by an Egyptian army kept them from moving farther west.

In 1260 Möngke's brother Kublai, also a grandson of Genghis Khan, became the new khan. Mongol power reached its highest point during his rule. Kublai Khan was interested mainly in China, though, and thought of himself as a Chinese emperor. He even moved his capital to what is now Beijing. He then defeated the Song Dynasty of southern China and established the Yuan, or Mongol, Dynasty over all of China. That dynasty lasted until 1368.

Fall of the Empire

The Mongol Empire began to fall apart in the 1300s. The Ming Dynasty took over China in about 1368. In 1380 a group led by Russians defeated the Golden Horde.

The last important Mongol ruler was Timur, or Tamerlane, who died in 1405. His conquests ranged from India and Russia to the Mediterranean Sea. But soon the empire was reduced to the original Mongol homeland and scattered kingdoms.

The Mongols lost power partly because of the way that they ruled their territories. The Mongols depended on local people to rule the conquered lands from day to day. As a result, power slipped away from the Mongol rulers.

► More to explore

Genghis Khan • Mongolia

Mongolia

Mongolia is a large, mountainous country in central Asia. It was once the center of the powerful Mongol Empire, which stretched across Asia into eastern Europe. Ulaanbaatar is Mongolia's capital and largest city.

Geography

Mongolia sits south of Russia and north of China. Mountains rise in the north and the west. The Altai Mountains have the highest peaks. Between the mountains are many lakes and rivers. There are hilly plains in the south and the east. The far south is part of the Gobi, a desert of rock and gravel.

Mongolia has long, cold winters with fierce blizzards. The summers are short and warm. The country is dry, especially in the southern desert. Northern and western Mongolia often have earthquakes.

Plants and Animals

Grasslands and pasture for livestock cover more than three quarters of Mongolia. Forests of larch, cedar, and other trees grow in the mountains. Few plants grow in the dry Gobi.

The animals found in the mountains include bears, deer, elk, wild boars, snow leopards, and sables (a type of weasel). Horses, sheep, donkeys, and camels live in the plains and some parts of the desert.

People

About 80 percent of the people are Mongols. The largest group of Mongols is the Khalkhas. Khalkha Mongolian is the country's main language. Nearly all Mongols are Buddhists.

The largest group of people who are not Mongols are the Kazakhs of western Mongolia. The Kazakhs speak a Turkic language. Many of them are Muslims.

More than half of the population lives in cities or towns. Some people in the huge rural areas live in yurts, or round tents.

Economy

Raising livestock is an important part of Mongolia's economy. Herders raise millions of sheep, goats, cattle, horses, camels, and pigs. A smaller number of farmers grow wheat, potatoes, and other vegetables.





A woman cares for her goats outside of a yurt in Mongolia.

Mining is Mongolia's most important industry. Mines provide coal, copper, and gold. Other industries process foods and make cloth, clothing, and leather goods. The country is famous for making cashmere, a very soft fiber made from the hair of Kashmir goats.

Facts About MONGOLIA



Population
(2008 estimate)
2,652,000

Area
603,930 sq mi
(1,564,160 sq km)

Capital
Ulaanbaatar

Form of government
Republic

Major cities
Ulaanbaatar,
Erdenet, Darhan,
Choybalsan,
Ulaangom



A Mongolian girl holds up a lamb. The raising of sheep and other livestock is a major part of Mongolia's economy.

History

For thousands of years the people of Mongolia were nomads, or wanderers. The nomads moved around to find food and water for their livestock. Some nomads began to form tribes about 1,000 years ago.

In 1206 Genghis Khan became the ruler of all the Mongol tribes. Under Genghis Khan the Mongols began conquering peoples in surrounding lands. By the end of the 1200s the Mongol armies had created a huge empire. It stretched across China and Russia into parts of the Middle East and eastern Europe. The Mongols also set up a royal family, known as the Yuan Dynasty, to rule China. The Mongols lost most of their territory in the 1300s. However, they kept their original homeland in central Asia.

In the 1600s a new Chinese dynasty, the Qing Dynasty, conquered Mongolia. The Chinese divided the territory into Inner Mongolia in the south and Outer Mongolia in the north. Inner Mongolia is still a part of China.

In 1911 Outer Mongolia gained independence from China. With the help of the Soviet Union, Communists won power in Mongolia by 1924. The country cut its ties to the Soviet Union in the early 1990s. Mongolia held democratic elections in 1990.

► More to explore

Communism • Gobi • Mongol Empire
• Nomad • Ulaanbaatar

Mongoose

Mongoose are small, quick mammals that are known for killing cobras and other poisonous snakes. A mongoose darts at the snake's skull, trying to crack it with a powerful bite. There are more than 40 different species, or types, of mongoose. They live in Africa, Asia, and southern Europe. The meerkat of southwestern Africa is a member of the mongoose family.

Mongoose are small and have short legs. They are about 7 to 35 inches (18 to 90 centimeters) long. The furry tail adds another 6 to 12 inches (15 to 30 centimeters). Mongoose have pointed noses and small ears. Their fur is gray to brown, sometimes with light flecks or dark spots.

Mongoose may live alone, in pairs, or in groups. Most mongoose live in underground holes called burrows. Mongoose eat small mammals, birds, reptiles, eggs, and fruit. Females usually give birth to two to four young.



Mongoose are bold snake fighters.

In the late 1800s people brought mongooses to the islands of Hawaii and Jamaica to kill rodents and snakes. But the mongooses also killed many rare and useful animals. The United States has strict rules about bringing mongooses into the country.

► More to explore

Mammal • Snake

Monk

A monk is a man who lives apart from society and devotes his life to religion. Monks tend to live a simple life of prayer and work. They usually do not have many belongings.

Types of Monk

There are two main types of monk. The first type is a hermit—a person who lives away from other people. These monks believe that being alone will help them get closer to God.

The second type of monk lives with other monks. The place where they live is called a monastery. Monks in monasteries have set times to pray, work, and study.

Roles

Some monks have helped the sick and the poor. Monks have also spread culture and education. Many years ago, they were often the only members of society who could read and write. They copied the Bible and other texts and set up some of the first libraries. They also did scientific research and taught farming.

Did You Know?

Roman Catholic monks are usually called brothers.



Buddhist monks line up to receive food from a woman in Southeast Asia.

Monks in Different Religions

Monks are found in several religions, including Christianity, Hinduism, Sikhism, Jainism, and Buddhism. Some of these religions allow female monks. They are called nuns. Monks are not officially a part of Islam or Judaism. However, people of those religions have formed religious communities.

Christianity

Saint Pachomius was a Christian who lived in Egypt in the AD 300s. He founded the first community of Christian monks.

During the Middle Ages (AD 500–1500) several orders (groups) of Catholic monks developed. The Benedictine, Dominican, and Franciscan orders of monks still exist today.

Eastern Orthodox monks helped to spread Christianity throughout eastern Europe. They did not form orders like Catholic monks, but they often lived together in communities.

Hinduism

Hindu monks in India appeared much earlier than Christian monks. Hindu monks spend most of their time in deep thought. Many live in monasteries.

Sikhism

Sikhism, centered in India, has some believers who are similar to Hindu monks. Some act as missionaries to spread Sikh beliefs.

Jainism

Jainism, also practiced in India, has two sects (divisions) of monks. Jain monks are vegetarian because they do not wish to harm any living creatures.

Buddhism

There are groups of Buddhist monks in many parts of Asia. Some Buddhist monks live in monasteries, where they study and teach their religion. Other monks wander alone. Buddhist monks do not generally work. They survive by begging for food.

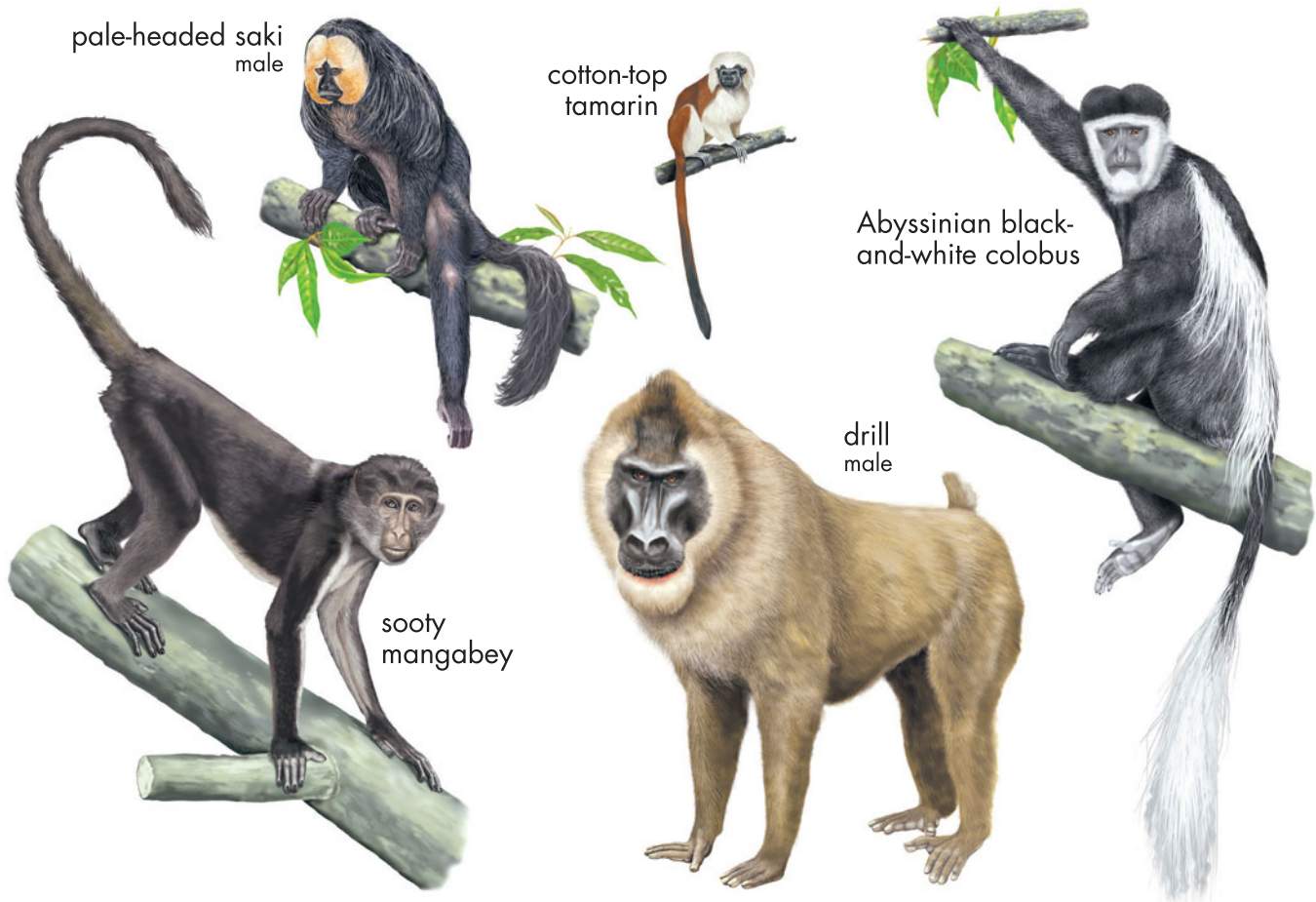
► More to explore

Buddhism • Christianity • Hinduism
• Jainism • Sikhism

Monkey

Monkeys are clever, social animals. They are known for running and leaping through trees with ease. Like apes and humans, monkeys belong to the group of mammals called primates.

Monkeys look somewhat like apes—for example, chimpanzees and orangutans.



Sakis and tamarins are New World monkeys. Mangabeys, drills, and colobus are Old World monkeys.

But monkeys differ from apes in several ways. For instance, every monkey has a tail, even if it is just a tiny nub. Apes do not have tails. Monkeys also generally have narrower chests than apes do.

There are about 200 species, or types, of monkey. Scientists divide them into two groups, Old World monkeys and New World monkeys. Old World monkeys include baboons, drills, mandrills, macaques, guenons, langurs, and colobus monkeys. Among the New World monkeys are marmosets, tamarins, howler monkeys, spider monkeys, squirrel monkeys, woolly monkeys, and capuchins.

Where Monkeys Live

Old World monkeys are found in Africa and parts of Asia. New World monkeys are found in the tropical regions of Central and South America. Most monkeys live mainly in trees in rain forests. Baboons and some other kinds live mostly on the ground in grasslands or rocky areas.

Physical Features

Monkeys vary greatly in size. The pygmy marmoset is only about 6 inches (14 centimeters) long, not including the tail. The largest baboons may grow to 45 inches (115 centimeters) in length.



An ebony langur climbs using all four of its limbs. An Old World monkey, the ebony langur is an endangered species that lives on Java, an island of Indonesia.

On the whole, Old World monkeys are larger than New World monkeys. Old World monkeys also have narrower noses than New World monkeys do. New World monkeys usually have long tails. Some kinds even use their tails to hold onto branches. By contrast, Old World monkeys cannot hold things with their tails. And some have only short stubs for tails.

Monkeys use all four limbs—two arms and two legs—to walk, run, and jump. Their hands and feet are good for grasping tree branches. Monkeys have a coat of hair on most of the body. Many types have bare areas of skin on the face and buttocks. Male mandrills and some other types have brightly colored skin in these bare areas. Most monkeys have fairly flat faces. However, baboons and

mandrills have doglike faces, with snouts that stick out.

Behavior

Most monkey species are active mostly during the day. But owl monkeys are active at night. They are also called night monkeys. Monkeys leap from tree to tree. They can sit and stand upright. Most species run along branches rather than swinging like apes do.

Monkeys are intelligent animals that are good at solving problems. Almost all types live together in groups. A monkey group commonly includes several related females, their young, and one or more males.

Monkeys use facial expressions, body movements, and various noises to communicate with each other. For example, squirrel monkeys have more than 25 different calls. These calls can sound like barks, purrs, screams, peeps, and squawks. The deep howls of howler monkeys can be heard from 2 to 3 miles (3 to 5 kilometers) away.



A family of anubis baboons in Kenya eats seeds together. An animal called a wildebeest is in the distance.

Most monkeys eat mainly plants. Different types eat fruits, flowers, seeds, shoots, roots, and leaves. Some types of monkey also eat birds' eggs, insects, and other small animals.

Reproduction

The period of pregnancy in monkeys ranges from about five months to more than seven months. In most species the female usually has one baby at a time. The babies are born helpless. Monkeys depend heavily on their parents for care during their early life. In most types the young monkeys become adults at about 3 to 4 years of age.

Under Threat

Many types of monkey are endangered, or at risk of dying out completely. People have cut down the trees in large parts of the rain forests where monkeys live. People also hunt monkeys for their meat and fur. In addition, some monkeys are captured and sold as pets.

► More to explore

Ape • Endangered Species • Mammal
• Primate • Rain Forest

Monomotapa

Monomotapa (or Mwene Matapa) was the title of a line of kings in southeastern Africa. The name is also used for the empire that they ruled from the 1300s to the 1600s. The Monomotapa lands lay between the Zambezi and Limpopo rivers in what are now Zimbabwe and Mozambique.



The Monomotapa people were members of the Shona ethnic group. They may have been related to the people of a nearby empire. That empire was centered on a city that is now known as Great Zimbabwe.

The people of the Monomotapa empire were mainly farmers. They also traded gold and ivory along the coast of the Indian Ocean.

According to legend, a ruler named Mbire founded the Monomotapa line of kings in the 1300s. His great-great-grandson Nyatsimba built up the empire in the late 1400s. Nyatsimba was the first king to have the title Monomotapa.

Portuguese explorers arrived in the area in the 1500s. In 1629 they put a king named Mavura on the throne. Mavura became a Christian and welcomed Portuguese traders and missionaries (Christians who worked to spread their

religion). Late in the 1600s the nearby Rozwi kingdom took power away from the Monomotapa.

► More to explore

Great Zimbabwe

Mononucleosis

Mononucleosis is a common disease that mostly affects teenagers and young adults. It is also called mono, glandular fever, or the “kissing disease.” Mononucleosis can last several weeks, but it is usually not serious. A virus found in saliva causes the disease.

The first symptoms, or signs, of mononucleosis include headache, fever, muscle aches, and tiredness. People with the disease may sleep 12 to 16 hours a day. A sore throat, joint pain, swollen glands, loss of appetite, a rash, and stomach pain may follow the first symptoms. In rare cases mononucleosis can lead to swelling and rupture of the organ called the spleen. The symptoms usually last for one to two weeks. However, the tiredness may last up to several months.

Scientists think that a kind of germ called the Epstein-Barr virus causes mononucleosis. People infected with the virus can spread it by kissing, coughing, or sharing food and drinks. The virus stays in the body for life. After having mononucleosis, people are immune to the disease. This means that they will not get it again.

There is no cure for mononucleosis. Treatment involves making sick people

more comfortable. They need plenty of rest and lots of fluids. People with mononucleosis should also avoid exercise and hard work until all the symptoms are gone.

► More to explore

Disease, Human • Virus

Monroe, James

James Monroe was the fifth president of the United States. He is best known for the Monroe Doctrine, a warning to European nations to stay out of the Americas. During Monroe’s two terms the country expanded and enjoyed growing wealth.

Early Life and Career

James Monroe was born in Westmoreland County, Virginia, on April 28, 1758. He was one of the five children of



James Monroe was the fifth president of the United States.

Did You Know?

Many people become infected with the Epstein-Barr virus without getting mononucleosis.



TIMELINE

Monroe is born in Westmoreland County, Virginia.

April 28, 1758

President James Madison makes Monroe secretary of state.

1811

Monroe states the Monroe Doctrine.

1823

Monroe dies in New York City.

July 4, 1831

Monroe becomes governor of Virginia.

1800

Monroe is elected president.

1816

Monroe retires from the presidency.

1825

Spence and Elizabeth Monroe. The American Revolution interrupted James's studies at the College of William and Mary. In 1776 Monroe left school to serve in the Army.

After the war Monroe studied law under Thomas Jefferson. Monroe was elected to the Virginia legislature in 1782. From 1783 to 1786 he served in the Continental Congress. Monroe married Elizabeth Kortright in 1786. They had three children.

Political Career

In 1790 Monroe was elected to the U.S. Senate, where he strongly opposed President George Washington. Monroe became minister to France in 1794, but Washington ordered him home in 1796.

Monroe served as governor of Virginia from 1800 to 1803. When Jefferson became president he sent Monroe to France to help buy the Louisiana Terri-

tory. Next Monroe served as minister to Great Britain.

In 1811 Monroe again became governor of Virginia. Later that year he resigned to become secretary of state under President James Madison. In 1814–15 he also served as secretary of war.

Presidency

Monroe won election as president in 1816. A Democratic-Republican, he easily defeated Rufus King of the Federalist Party. Monroe was reelected in 1820.

Monroe faced the country's first conflict over slavery when Missouri wanted to enter the Union. The North did not want to allow slavery in the new state. Finally, in 1820 Congress decided to admit Maine as a free (without slavery) state to balance the addition of Missouri, a slave state. That agreement was known as the Missouri Compromise.

Monroe gained the territory of Florida from Spain by 1821. In 1823 he announced the famous policy that came to be called the Monroe Doctrine. Monroe stated that Europe should not form any more colonies in the Americas. He also stated that European countries should stay out of the affairs of the Western Hemisphere.

Retirement

In 1825 Monroe retired to Oak Hill, Virginia. He later moved to New York City, where he died on July 4, 1831.

► More to explore

Continental Congress • Jefferson, Thomas • Louisiana Purchase • Madison, James • Missouri Compromise • United States • Washington, George

Monrovia



Population
(2008 estimate), urban area, 1,010,970

Monrovia is the capital of Liberia, a country in western Africa. The city lies on the coast of the Atlantic Ocean. It is Liberia's main port and largest city. Monrovia suffered much damage during a civil war in the late 20th and early 21st centuries.



Government buildings stand in Liberia's capital, Monrovia.

Shipping goods through the port is important to Monrovia's economy. Rubber is the main product that Liberia ships out through Monrovia. In addition, many ships around the world have carried the name of Monrovia as their home port. Shipowners pay fees to register their ships there. The city is also Liberia's center of education and business. However, many of its businesses were hurt by the long war.

Liberia was created in the 1800s to be a home for former slaves. Freed U.S. slaves began settling Monrovia in 1822. The town was named after James Monroe, who was president of the United States at the time. In 1847 Monrovia became the new country's capital.

Rebels fought the government of Liberia from 1989 to 2003. Fierce fighting took place in and around Monrovia. After the war the city began to rebuild its damaged buildings and economy.

► More to explore

Liberia

Montana

The U.S. state of Montana got its name from the Spanish word for “mountain.” The Rocky Mountains cover the western part of this large state. Montana is the nation’s fourth largest state.

Because of the many minerals found in Montana, the state is nicknamed the Treasure State. People flocked to the area in the 1860s looking for gold. The state capital is Helena.

Geography

Montana is located in the northwestern part of the United States. Montana is bordered on the north by three Canadian provinces: Saskatchewan, Alberta, and British Columbia. The U.S. state of Idaho is to the west and southwest. Wyoming is to the south, and North Dakota and South Dakota form the eastern border.

Although Montana’s name suggests a mountainous region, high plains cover more than half of the state. The Rocky Mountain part of the state includes many mountain ranges, including the Bitterroot. Between the ranges are narrow valleys that are good for growing crops.

One of the country’s great rivers, the Missouri, begins in the Rocky Mountain area of Montana. It eventually joins the Mississippi River north of Saint Louis, Missouri.

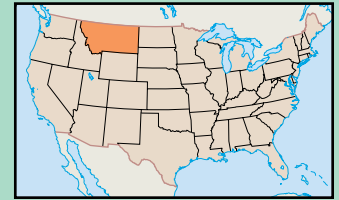
People

Whites make up about 90 percent of the state’s population. The early white settlers of Montana came from almost every state in the Union. Later others arrived from many European countries and Canada.

Montana was originally home to several Native American tribes, including Crow, Blackfoot, Sioux, Assiniboin, Cheyenne, Shoshone, Arapaho, Flathead, and Kootenai. Today Native Americans make up about 6 percent of Montana’s population. Many of them live on reservations.

Economy

Montana has thousands of farms and ranches, many of them quite large. Sales of livestock, particularly cattle and sheep, account for more than half of the state’s agricultural income. Montana is also a leading producer of barley and wheat.



Facts About MONTANA

Flag



Population

(2000)
902,195—rank,
44th state; (2008
estimate)
967,440—rank,
44th state

Capital

Helena

Area

147,042 sq mi
(380,838 sq
km)—rank, 4th
state

Statehood

November 8,
1889

Motto

Oro y Plata (Gold
and Silver)

State bird

Western
meadowlark



State flower

Bitterroot



Montana has large commercial forests. The production of lumber and wood products is the state's leading manufacturing industry. Food processing is another major industry. The largest share of the state's workers, however, work in service industries. Government operations and health care are among the most important of these. The tourist industry is one of Montana's largest sources of income. Coal, petroleum (oil), and natural gas are the most valuable mineral resources.

History

Montana was part of the land the United States bought from France in the Louisiana Purchase of 1803. A few years later members of the Lewis and Clark Expedition explored and reported on the territory.

Gold discoveries in the early 1860s brought miners to the area. Cattle and sheep raising began later in the decade. In 1881 copper was discovered near Butte, giving rise to another major industry.

Montana Territory was created in 1864. It became the nation's 41st state in 1889. Beginning in about 1900 settlers known as homesteaders entered the state to claim land. They introduced large-scale grain farming to the area.

By the 1920s Montana's farm economy was struggling. The situation was made worse by the Great Depression of the 1930s. Eventually scientists made advances in farming that helped the farmers. Forestry and mining began to



Bear Hat Mountain towers above Hidden Lake in Montana's Glacier National Park.

grow as well. These all helped the economy to recover. In the early 21st century Montana worked to develop its tourism industry and to encourage the development of other businesses.

► More to explore

Helena • Lewis and Clark Expedition
• Louisiana Purchase



Grave markers at the Little Bighorn Battlefield National Monument in Montana honor people who died there during a famous battle in 1876. A group of Native Americans defeated U.S. troops who were trying to force them to move to a reservation. However, the Indians eventually lost their land.

Montenegro

Montenegro is a small country in south-eastern Europe. It lies on the Balkan Peninsula along the Adriatic Sea. Montenegro has two capitals—Podgorica and Cetinje.

Montenegro borders Croatia, Bosnia and Herzegovina, Serbia, Kosovo, and Albania. Rugged mountains and valleys make up most of Montenegro's land. Forests cover about a third of the country. Wildlife includes foxes, wolves, wildcats, bears, deer, wild pigs, and many kinds of bird.

Most of the country's people are Montenegrin, a Slavic people similar to the Serbs of Serbia. Most Montenegrins are Eastern Orthodox Christians. Some Bosniacs and Albanians also live in Montenegro. They are mainly Muslim.

Manufacturing is a major part of Montenegro's economy. Factories process foods and metals. Farmers grow grains



Sveti Stefan is a vacation center. A road connects it to the mainland of Montenegro.

and raise sheep and goats. Mining, logging, and tourism also are important.

People have lived in what is now Montenegro since ancient times. It became part of the Serbian empire in the 1100s. In 1389 the Ottoman Turks conquered Serbia but not Montenegro. Montenegro was then independent for more than 500 years.

After a period of Turkish rule, Montenegro joined Serbia and neighboring countries to form one larger country in 1918. It was called the Kingdom of Serbs, Croats, and Slovenes. Its name was changed to Yugoslavia in 1929.

In the 1990s parts of Yugoslavia broke away to become independent countries. After a civil war, only Montenegro and Serbia remained part of Yugoslavia. In 2003 they formed a country called Serbia and Montenegro. Montenegro became independent in 2006.

► More to explore

Balkan Peninsula • Yugoslavia



Facts About MONTENEGRO



Population
(2008 estimate)
626,000

Area
5,333 sq mi
(13,812 sq km)

Capitals
Podgorica,
Cetinje

Form of government
Republic

Major cities
Podgorica,
Niksic, Pljevlja,
Bijelo Polje,
Cetinje



Montevideo



Population
(2004 estimate)
1,269,552

Montevideo is the capital of Uruguay, a country on the east coast of South America. The city lies on a part of the Atlantic Ocean called the Río de la Plata. It is much larger than any other city in Uruguay. It is the country's center of education and business.

Montevideo is a major port. Trade and shipping through the port are important to the city's economy. Factories in Montevideo process foods, wool, oil, and cement. Meatpacking has long been a major industry in the city. Service industries such as banking, education, and tourism also bring money to the city.



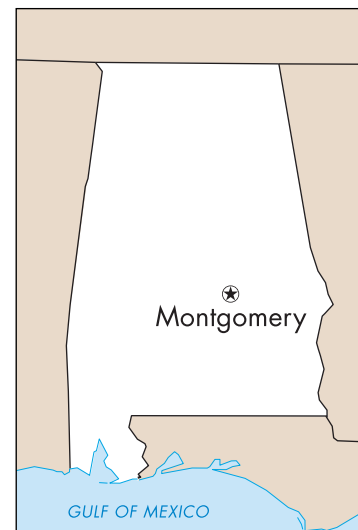
The government of Uruguay works in buildings in Montevideo, the country's capital.

Montevideo was founded in 1726 as a Spanish military post. The city grew as it began trading through its excellent port. A series of different countries took control of Montevideo in the early 1800s. In 1828 Uruguay became an independent country with Montevideo as its capital.

► More to explore

Uruguay

Montgomery



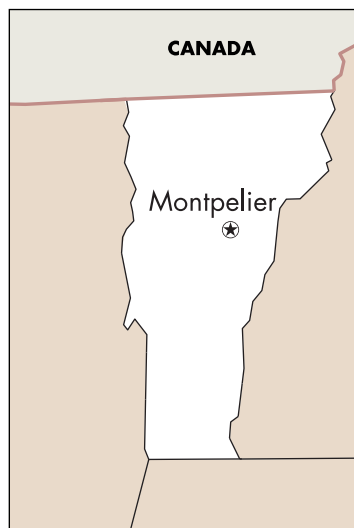
Population
(2007 estimate)
204,086

Montgomery is the capital of the U.S. state of Alabama. The city is known for its role in both the American Civil War and the civil rights movement. Many people in the city work for the government or in trade, health care, and other service industries.

Montgomery was founded in 1819. It became the capital of Alabama in 1847.

In 1860 and 1861 the Southern states, including Alabama, broke away from the United States. Just before the American Civil War began in 1861,

Montpelier



Population
(2000 census)
8,035; (2007
estimate) 7,806

Montpelier is the capital of the U.S. state of Vermont. The city lies on the Winooski River in the wooded hills of the Green Mountains. It has the smallest population of all the state capitals in the United States.

Many people in Montpelier work for the government. The headquarters of several insurance companies are in the city. Tourism and other service industries are also important to the city's economy.



The state Capitol in Montpelier, Vermont, is pictured in autumn.

► More to explore

Alabama • Civil Rights Movement
• Confederate States of America • King, Martin Luther, Jr. • Parks, Rosa

In 2005 people in Montgomery, Alabama, honored the 50th anniversary of the Montgomery bus boycott. During the boycott people refused to ride city buses as a protest against segregation, or separation of the races.

leaders of those Southern states met in Montgomery. There they formed a new government called the Confederate States of America. Montgomery was the capital of the Confederacy for a few months.

The civil rights leader Martin Luther King, Jr., was a minister in Montgomery in the mid-1900s. In 1955 a black woman from the city named Rosa Parks refused to give up her bus seat to a white passenger. She was arrested for this. King then led a protest in which people refused to use the city's buses. In 1965 King led another civil rights protest in the city. It was a march from Selma, Alabama, to Montgomery.



Montpelier was founded in the 1780s. The first settlers were soldiers who had fought in the American Revolution. The first permanent home on the site was built in 1787. Montpelier was named the state capital in 1805.

► More to explore

Vermont

Moon

The Moon is a large natural object that orbits, or travels around, Earth. After the sun it is the brightest object in the sky.

The average distance between the Moon and Earth is about 238,900 miles (384,400 kilometers). Compared to the distance between other planets and Earth, this distance is small. In fact, the Moon is close enough to affect the level of seas on Earth. Every day the seas seem to rise and fall. This is because of a force called gravity. The Moon's gravity pulls on Earth. It is too weak to affect the whole planet, but it does make the water move. This creates tides.



The Moon is the most prominent feature in the night sky.



A view of the near side of the Moon shows some of its many craters.

Physical Features

The Moon is slightly more than one quarter the size of Earth. Its diameter, or distance through its center, is about 2,200 miles (3,500 kilometers).

The Moon is made mostly of rock. The surface has thousands of pits called craters. The craters form when chunks of rock and metal called meteorites crash into the Moon. These crashes have covered the Moon's surface with rocks and dust. The Moon also has plains made of lava that erupted from volcanoes billions of years ago.

During the daytime, when the Moon faces the sun, its surface temperature averages about 225° F (107° C). However, at night the temperature drops to about -243° F (-153° C).

Orbit and Spin

Like the planets, the Moon has two types of movement: orbit and spin. The Moon orbits Earth. It takes the Moon

about 27 days to make one trip around Earth. The Moon also spins about its center. It completes one rotation in about 27 days—the same amount of time it takes to complete one orbit. For this reason, the same side of the Moon always faces Earth.

Phases and Eclipses

When viewed from Earth, the Moon looks different at different times. These varying appearances are called phases. Sometimes the Moon looks like a full circle. At other times it appears as only a thin slice or looks completely dark. However, the Moon's shape does not change—it just looks that way from Earth. The Moon reflects light from the sun. As the Moon orbits Earth, the sun shines on different parts of the Moon.

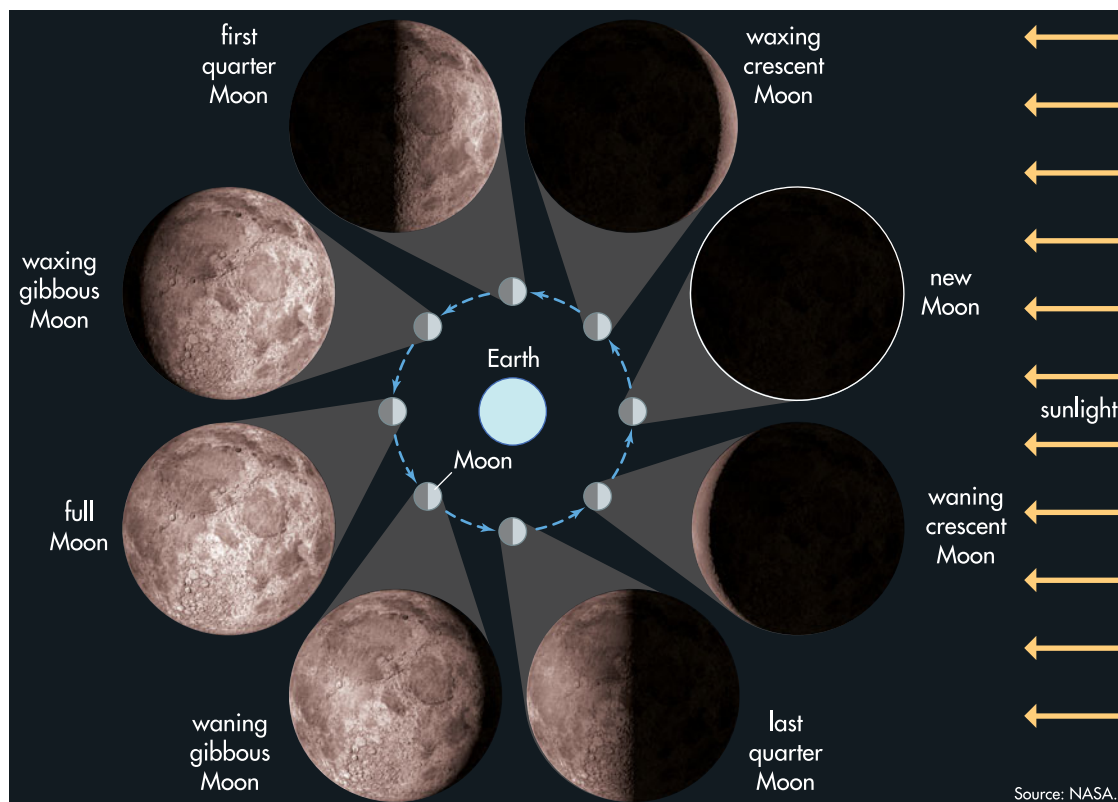
This causes different parts to be visible from Earth.

Sometimes the way the Moon, the sun, and Earth are positioned causes an event called an eclipse. During an eclipse of the sun, the Moon blocks the view of the sun for a short time. During an eclipse of the Moon, Earth prevents the sun from shining on the Moon.

Observation and Exploration

People have observed the Moon since ancient times. In the 1600s the invention of the telescope allowed people to study the Moon more closely.

Even greater advances in knowledge have come from the many spacecraft sent to the Moon since 1959. In 1966



The diagram shows the position of the Moon at each of its phases. The enlarged pictures of each phase are photographs taken from Earth.

Luna 9, a spacecraft from the Soviet Union, became the first unmanned craft to successfully land on the Moon. In 1969 the U.S. Apollo 11 craft carried the first people—Neil Armstrong and Edwin (Buzz) Aldrin, Jr.—to walk on the Moon. Ten other astronauts have walked on the Moon since then.

► More to explore

Earth • Eclipse • Meteor and Meteorite
• Space Exploration • Tide

Moor

In the AD 700s a group of people invaded Spain. These conquerors were Arabs (people from Arabia) and Berbers (a tribe from northern Africa). They practiced the religion of Islam. The Arab-Berber invaders soon began marrying Spanish people. Their descendants came to be known as the Moors.

The arrival of the Arab-Berber invaders began 700 years of Islamic power in Spain. Eventually, however, weak leaders

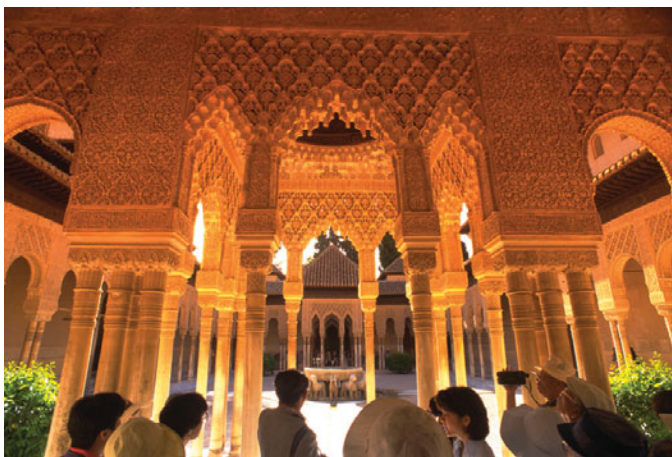
led to the fall of the Moors. Christian kingdoms that had formed in the northern mountain regions took land from the Moors bit by bit. By 1212 the Moors controlled only the kingdom of Granada in southern Spain.

In 1492 Spanish Christians conquered Granada. The Christians forced Moors who practiced Islam out of Spain. Moors who stayed in Spain became Christians, or they pretended to follow Christianity while secretly practicing Islam.

Descendants of the Moors who stayed in Spain were known as Moriscos. Early in the 1600s the Spanish drove the Moriscos out of Spain because of their political and religious beliefs. Most of them moved to northern Africa. Today descendants of the Moriscos live along the coasts of Morocco and Algeria in northwestern Africa. Sometimes they are still called Moors.

► More to explore

Arabs • Islam



The Alhambra is a palace and fortress overlooking the town of Granada in Spain. It was home to the Moors who ruled parts of Spain from the AD 700s to 1492.

Moose

The moose is the largest animal of the deer family. It is best known for its large head and antlers. The scientific name of the moose is *Alces alces*. Moose are called elk in Europe.

Moose live in Canada, Alaska, and the Rocky Mountain region of the United States. They are also found in the northern forests of Europe and Asia. They like to be near rivers, ponds, and lakes.



An adult male moose stands in water.

Moose are heavy, long-legged animals. A full-grown male may stand more than 7 feet (2.1 meters) tall at the shoulders and weigh more than 1,400 pounds (635 kilograms). Females, or cows, are slightly smaller. A moose's fur is thick and dark brown, though it can look reddish or almost black.

Only a male moose grows antlers. The antlers are flattened with upright points and may spread more than 5 feet (1.5 meters) across. Each year, a male will lose and then regrow its antlers. As the antlers grow, they are covered with a protective skin, called velvet. The velvet eventually rubs off.

Moose are active during the day, especially at dusk and dawn. They have a good sense of hearing and smell, but they do not see very well. Moose rarely run. However, they are good swimmers. They eat water plants such as pondweed and water lilies. They also eat grasses, herbs, twigs, and bark.

► More to explore

Deer

Mormon

Members of the Church of Jesus Christ of Latter-day Saints are known as Mormons. The church is based in Salt Lake City, Utah. Its main holy books are the Bible and the *Book of Mormon*.

Beliefs

Joseph Smith, the religion's founder, believed that Christianity had gone astray in its beliefs and practices. In creating Mormonism, he sought to restore the "true" Christian church.

Mormons share the Christian belief that Jesus came to Earth to save humankind. But Mormonism differs from most forms of Christianity in many ways. For example, Mormons believe that the way they live will affect whether they are



Brigham Young was an important president of the Mormon church. In the 1840s he led Mormon settlers to what is now the U.S. state of Utah.



A large Mormon temple stands in Temple Square in Salt Lake City, Utah.

saved. They also believe that faithful members of the church will eventually become gods.

Practices

Faithful Mormons attend worship services regularly. They must not drink alcohol, tea, or coffee or use tobacco. Young people are encouraged to help spread the faith through missionary work for 18–24 months.

Mormons become church members through baptism, a ceremony that involves being blessed with water. Adults also undergo baptism on behalf of their dead ancestors who were not Mormons. They believe that this allows their ancestors to enter God's highest eternal kingdom.

History

Smith said that in 1827 an angel gave him sacred writings. Smith published

these writings as the *Book of Mormon* in 1830 and began to organize a new church.

Smith established religious communities in Ohio and Missouri, but people in Missouri were hostile toward the Mormons. Many Mormons moved to Illinois to found a new city. There, the Mormons' wealth and political power upset their neighbors. In 1844 Smith was arrested and was murdered while in jail.

Brigham Young soon became president of the church. Growing violence against the Mormons led Young to lead them on a long journey to what is now Utah.

But not all Mormons accepted Young as their leader. Some who rejected him remained behind and formed another church. Today, this church is known as the Community of Christ.

In 1849 the Utah Mormons applied for statehood. The U.S. government refused them, mostly because the Mormons engaged in polygamy—a practice in which a man has more than one wife at a time. The Mormon church ended the practice of polygamy in 1890. Utah became a state in 1896.

In the 1900s the church's missionaries won many converts. By 2000 the church had about 11 million members worldwide.

► More to explore

Christianity • Jesus Christ • Salt Lake City • Utah

Did You Know?

Mormon temples are different from Mormon churches. Temples are open to Mormons only.

Morocco

The Kingdom of Morocco is the only country in Africa with coastlines on both the Atlantic Ocean and the Mediterranean Sea. Rabat is the capital.

Geography

Morocco sits at the northwestern edge of Africa. It shares borders with Algeria and the territory of Western Sahara.

Morocco has controlled Western Sahara since the 1970s.

The Atlas Mountains divide Morocco into eastern and western halves. The Rif Mountains run along the Mediterranean coast. Mount Toubkal, in the Atlas Mountains, is Morocco's highest peak. It reaches a height of 13,665 feet (4,165 meters). The southern and southeastern edges of Morocco lie within the Sahara, the world's largest desert. Most of the country has mild, wet winters and hot, dry summers.

Plants and Animals

Forests of oak, fir, and cedar trees grow in the mountains. Bushes and grasses cover the lowlands. A forest of cork oak trees grows east of Rabat.

Many large animals in Morocco have disappeared because of hunting. The government protects Morocco's Barbary apes, which live in the Atlas Mountains. Morocco has many birds, including storks, flamingos, pelicans, and cattle egrets.

People

The people of Morocco are mostly Arabs and Berbers (a tribe from northern Africa). More than half of the people live in cities, mainly in the northwest. Arabic is the main language. Some people also speak French or Berber languages. Islam is the national religion.

Economy

Manufacturing and mining are important parts of Morocco's economy. Factories make food and tobacco products, clothing, and chemicals. Morocco's mines provide large amounts of phosphates, which are used to make fertilizers and other products. Tourism is another important industry.

Many Moroccans are farmers or fishers. Major crops include wheat, barley, sugar beets, citrus fruits, vegetables, and olives. The Atlantic Ocean provides a large catch of fish.



History

Morocco's early peoples included Berber tribes. Traders from the Middle East began arriving in North Africa more than 2,000 years ago. The Roman Empire controlled the region in the AD 300s.

Arab armies arrived in 692. Many people converted to Islam. Islamic Berber kingdoms ruled Morocco from the 1000s to the 1200s. They also ruled much of Spain and North Africa. By the end of the 1600s Morocco was a strong and independent Islamic kingdom.

Facts About MOROCCO



Population
(2008 estimate;
includes Western
Sahara)
32,103,000

Area
177,117 sq mi
(458,730 sq km;
excludes Western
Sahara)

Capital
Rabat

**Form of
government**
Constitutional
monarchy

**Major urban
areas**
Casablanca,
Rabat, Fès,
Marrakech,
Tangier



Date palms and farmers' fields lie outside a village on the slopes of the Atlas Mountains in Morocco.

European Control

In 1830 France invaded Morocco's neighbor Algeria. France took control of most of Morocco in 1912. Spain controlled parts of northern and southern Morocco. The Moroccan king stayed on the throne, but the French held the real power.



Colorfully dyed wool is displayed in a market in Marrakech, Morocco.

The Berbers in the Atlas Mountains fought the French until 1934. During World War II (1939–45) Moroccans began to call for independence. Morocco gained independence from both France and Spain in 1956.

Western Sahara

In 1975 Morocco took over the northern part of Western Sahara. The Spanish, who controlled the territory, left in 1976. Morocco took the southern part of Western Sahara from Mauritania in 1979. Meanwhile, a rebel group from Western Sahara was fighting for the territory's independence. To escape the violence many West Saharans went to Algeria. At the start of the 21st century the people of Western Sahara still had not agreed to Moroccan rule.

► More to explore

Arabs • Rabat

Moroni



Population
(2003 estimate)
41,600

Moroni is the capital of Comoros, an island country off the east coast of Africa. The city is located on the western edge of Ngazidja (or Grande Comore), the country's largest island. It is the largest city in Comoros.

Moroni has a port on the Indian Ocean. Ships load up there with products such as vanilla, cloves, and ylang-ylang (flowers used in perfume). Tourism also brings money to the city.

Muslim Arabs founded Moroni. The French took over Moroni and the rest of Comoros in the 1800s. Moroni became the capital of the islands in 1958. In

1975 Comoros became an independent country with Moroni as its capital. Afterward the city was the site of many violent protests and takeovers of the country's government.

► More to explore

Comoros

Morse Code

Morse Code is a system of electronic communication. It uses dots, dashes, and spaces to represent letters, punctuation, and numbers. The symbols are arranged to spell out a message. A machine called a telegraph converts the symbols into electrical signals and sends them across a wire to their destination. The signals are then converted back into the message by the telegraph that receives them.

A U.S. artist and inventor named Samuel F.B. Morse created Morse Code in the 1830s. Before his invention, an important message could take weeks to reach its destination. Morse Code and the telegraph allowed people to receive information sent from far away in just minutes. Wires were strung all across the United States for the use of the code. Newspapers, railroads, and businesses used the code and the telegraph to send news quickly from one city to another.

A second type of Morse Code was created in Europe in 1851. It was called the International Morse Code, or the Continental Morse Code. It was simpler than the original code. It also included extra letters with special marks on them, such

Did You Know?

SOS is an international call for help. S (three dots) and O (three dashes) are easy letters to understand.



Small fishing boats line the harbor at Moroni on Ngazidja, Comoros.

American	International	American	International
A	•—	Q	••—•—
Ä	•••—	R	••—•
Å	••—••	S	•••—
À	••—••	T	—••
B	••••	U	••—•
C	••••	Ü	•••—•
CH	—•••	V	•••—•
D	•••—	W	••—••
E	••	X	••••—
É	•••••	Y	••••—
F	••••	Z	••••—
G	—•••	1	••—••—
H	••••	2	••—••—
I	••	3	•••—•—
J	••—••	4	••••—
K	••—•	5	••••—
L	—•••	6	••••—
M	—•—	7	••—••—
N	••—	8	••••—
Ñ	—•••—	9	••••—
O	••—	0	—•••—
Ö	—•••	@	••••—
P	•••••		

The American Morse Code and International Morse Code use patterns of dots and dashes to represent letters, punctuation, and numbers. Dots stand for short sounds and dashes stand for long sounds.

as ç or ñ, that are used in some European languages.

► More to explore

Communication • Telegraph

Moscow



Population
(2006 estimate)
10,425,075

Moscow is the capital of Russia, a country that extends from eastern Europe to the Pacific Ocean. It is Russia's major center of industry, science, and culture. The city lies on the Moskva River.

Places of Interest

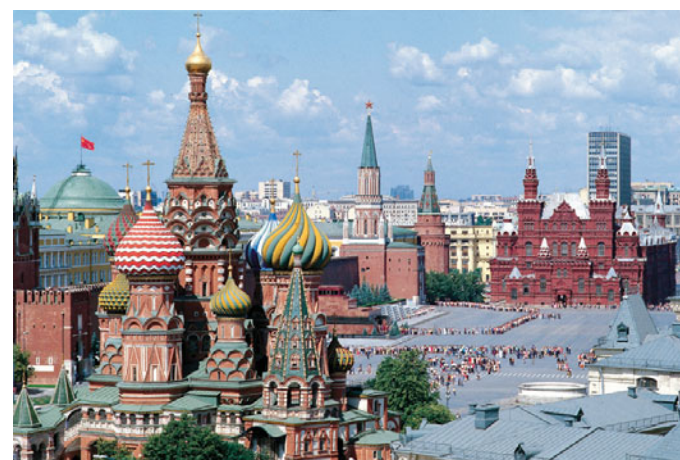
The collection of buildings called the Kremlin forms the core of the city. It was originally a fortress and has been the center of the country's government for many years. Next to the Kremlin is Red Square, which has been the scene of many protests, parades, and speeches. A famous building on the square is the Cathedral of Saint Basil. Moscow also has more than 30 major theaters and concert halls, including the Bolshoi Theater of Opera and Ballet.

Economy

Moscow is the largest industrial center in Russia. Factories in the city make many products, including machinery, cars, ball bearings, and electrical equipment. Many people in Moscow work in businesses that serve the public, including banks, stores, and restaurants. The city is also a center for education and research.

History

People have lived in the Moscow area since ancient times. In the 1100s a



The colorful domes of the Cathedral of Saint Basil tower over Red Square in Moscow.

prince built a fort to protect the people living there. A settlement close to the fort grew into a town.

By the 1500s Moscow was a major city and was the capital of Russia. However, a new city called Saint Petersburg became Russia's capital in 1712. Most of Moscow's nobles and merchants moved to the new capital. In 1812 there was a great fire in Moscow. These events slowed the city's growth.

Moscow did not recover its role as capital until after the Russian Revolution of 1917. As a result of the revolution, Russia became part of a new country called the Soviet Union. In 1918 Moscow became the capital of the Soviet Union. The city then grew rapidly.

In 1941, during World War II, German troops tried to capture Moscow. However, Soviet troops stopped the invaders a few miles from the city.

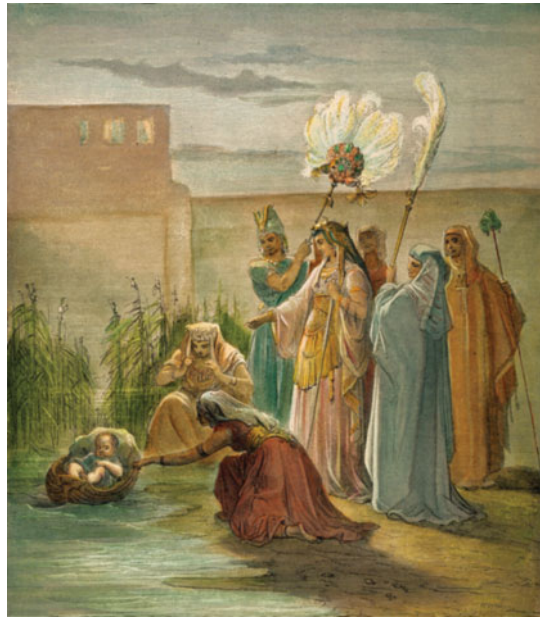
The Soviet Union broke apart in 1991. Russia became a separate country again, and Moscow was its capital.

► More to explore

Kremlin • Russia • Saint Petersburg
• Union of Soviet Socialist Republics

Moses

Moses is a central figure in Judaism. He was the prophet who led the Hebrew slaves out of Egypt. He also helped them form a special relationship with God. Moses is important to Christianity and



An illustration shows the baby Moses being found by the pharaoh's daughter.

Islam too because of his role in communicating God's laws.

Early Life

Moses was probably born in the late 1300s BC in Egypt to Hebrew parents. The Egyptians kept the Hebrews as slaves. The Egyptian ruler, called the pharaoh, had ordered that all newborn male Hebrews be killed. According to tradition, Moses' mother sent him floating down the Nile River in a basket to save him. The pharaoh's daughter found the baby, and he grew up in the royal court.

The Hebrews Leave Egypt

As a young man Moses killed an Egyptian who was beating a Hebrew slave. Then Moses fled to a neighboring land. According to the Bible, he had his first encounter with God there. At the base of Mount Sinai Moses discovered a bush that was burning but was not burned

Did You Know?

Some of the other plagues from God were frogs, locusts, flies, darkness, and hail.

up. From out of the bush he heard the voice of God telling him to ask the pharaoh to free the Hebrews.

The Bible records that Moses pleaded with the pharaoh, but the pharaoh refused to free the Hebrews. God then punished the Egyptians with 10 plagues. The final plague took the life of the pharaoh's son, and the Hebrews left Egypt. But the pharaoh's army pursued them until they were trapped at the Sea of Reeds (once believed to be the Red Sea). What many believe to be a miracle happened there: winds created a dry path through the sea that allowed the Hebrews to cross, and the Egyptian army was drowned as the waters returned.

Ten Commandments

Moses brought the Hebrews to Mount Sinai, where God again revealed himself to Moses. On the mountain God gave Moses the laws known as the Ten Commandments. They told the people to worship God only and forbade such actions as lying, stealing, and killing. God made a covenant, or agreement, with the Hebrews. If they followed His laws, He would be their God forever. Later, these laws and others were recorded in the Torah (part of the Hebrew Bible).

Late Life

Moses spent the rest of his life leading his people through the desert to Canaan (Palestine), a land God had promised to give them. The journey was long and hard. The Hebrews sometimes questioned Moses' leadership and lost faith

in God. When Moses got frustrated with some rebels, God saw it as a lack of faith and denied him entrance to the promised land.

Moses' last official act was to renew the covenant. He then climbed Mount Pisgah, on the eastern edge of the Jordan River. He is believed to have died there—able to see, but not to enter, the promised land. According to the Bible, Moses lived for 120 years.

► More to explore

Bible • Christianity • Islam • Judaism
• Palestine • Torah

Mosque

A mosque is a place of prayer for Muslims, or followers of the religion of Islam. The first mosque was the courtyard in the home of Muhammad, Islam's founder.

The inside of a mosque always includes an open space for worship. Rugs or mats



The Blue Mosque in Istanbul, Turkey, is decorated with stained glass and mosaics.

may cover the floor. A nook in one wall, called a *mihrab*, shows the direction of Mecca, Islam's holiest city. To the right of the *mihrab* is a platform or small tower, called a *minbar*. Religious leaders climb steps up to the *minbar*, where they speak to the worshippers. Every mosque must also have a source of running water for washing. Muslims are required to wash before prayer.

Outside most mosques is a tall tower, called a minaret. From the minaret a crier, or *muezzin*, calls Muslims to prayer. Some mosques have up to six minarets.

Mosques are different in some ways from churches and synagogues. They do not have chairs or seats. The worshippers stand together, barefoot, in rows. They bow down and kneel when praying. Men and women worship separately. Mosques never contain statues or pictures, and music and singing are forbidden.

► More to explore

Church • Islam • Synagogue

Mosquito

Mosquitoes are insects that are found almost everywhere in the world. Female mosquitoes bite animals and people, leaving itchy bumps. Mosquitoes can spread malaria, yellow fever, and other serious diseases through their bites. Mosquitoes are part of a large group of insects called flies.



When female mosquitoes bite, they inject saliva into the wound. This makes it easier for them to draw blood. The saliva is what causes mosquito bites to itch.

A mosquito has a soft body with a hard covering called an exoskeleton. It has two narrow wings, two antennae, and six long legs. A female mosquito usually has a mouthpart called a proboscis, which looks like a long tube. She uses her proboscis to pierce skin and suck blood from animals. She needs the blood for her eggs to develop. Male mosquitoes do not bite. Their mouthparts are designed for feeding on plant juices.

Female mosquitoes lay their eggs on the surface of standing water. The eggs hatch into long, wriggling larvae. The larvae live at the surface of the water. They molt (shed their outside covering) a few times and then change into a new form, called pupae. Pupae also live in the water. They develop into adults that can fly away and reproduce.

Mosquitoes are considered pests because they carry so many diseases. But getting rid of mosquitoes is difficult. One way is to drain the water out of ditches, swamps, and ponds where they lay their eggs. To destroy full-grown mosquitoes, insecticides are sometimes used. Insecti-

cides are powders or liquids for killing harmful insects. But they can be dangerous for animals and people, too.

► More to explore

Fly • Insect • Malaria

Moss

Mosses are small, seedless plants that often grow in moist, shady places. More than 10,000 species, or types, of moss grow throughout the world. They belong to a group of plants called bryophytes. Liverworts and hornworts are other plants in this group.

Mosses range in size from too small to see to more than 40 inches (1 meter) long. They grow closely together in thick mats. Many types of moss form velvety green carpets on forest floors. These green mosses also grow on trees and rocks. Peat, or sphagnum, mosses grow in patches in bogs, in swamps, near ponds, and in other wet places. They may be green, red, orange, or

brown. Granite, or rock, mosses grow on rocks in cold regions. They are reddish brown or black.

Unlike most other plants, mosses reproduce through cells called spores, not seeds. A stalklike structure produces and releases the spores. When a spore lands on a moist surface, it grows into a low, branching structure. This structure spreads across the surface of the soil, wood, or rock. Leafy shoots grow up from this low part of the plant. These shoots produce male and female sex cells. Once two sex cells join together, they grow into a new spore-producing stalk. New moss plants also can grow from pieces of old moss plants.

Some living things called mosses are not really mosses at all. Some, such as Irish moss, are actually algae. Others—including beard moss, Iceland moss, reindeer moss, and oak moss—are lichens. Club mosses and Spanish moss are plants, but they are not related to true mosses.

► More to explore

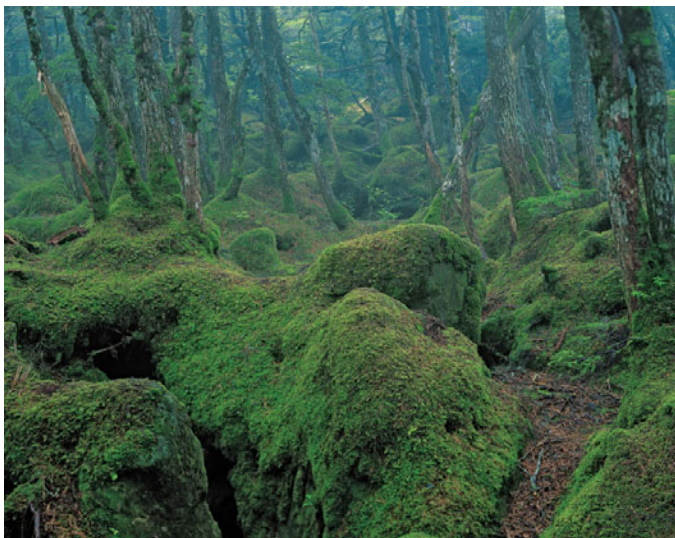
Algae • Bog • Lichen • Plant

Moth

► see Butterfly and Moth.

Mother Goose

Some people think that many children's songs and nursery rhymes were written by someone called Mother Goose. She is often pictured as an elderly woman



Moss covers a forest floor.



"There Was an Old Woman Who Lived in a Shoe" is a popular nursery rhyme from Mother Goose.

riding on the back of a flying goose. But scholars do not know if Mother Goose ever existed.

According to one story Mother Goose was a woman named Elizabeth Goose. She lived in Boston, Massachusetts, in the 1600s. Some people believe that rhymes she made up for her grandchildren survived as the Mother Goose tales familiar today. But no one has found any proof that she wrote the stories.

In France a book of fairy tales published in 1697 was called *Tales of Mother Goose*. In the 1760s John Newbery of England published the first edition of Mother Goose rhymes as they are now known. He probably took the name Mother Goose from the French book. Newbery's book was published in the United States

in about 1785. Generations of American children have learned the rhymes, such as "Humpty Dumpty" and "Little Miss Muffett."

► More to explore

Nursery Rhyme

Mother Teresa

► see Teresa, Mother.

Motion

When we say that something is in motion, we usually mean that it is moving. But motion has a special meaning in science. In science, motion is a change in position compared to a place or an object that is not moving. The place or object that is not moving is called the frame of reference.

Motion is a kind of puzzle because every object in the universe is in motion. This means that no frame of reference is correct in every situation. For example, a car is in motion when the ground is the



A boy on a swing is in motion.

frame of reference. In this situation, we think of the ground as not moving. But the ground, a part of Earth, is in motion when the sun is used as the frame of reference. This is because Earth travels around the sun.

Describing Motion

An object in motion can be described by its speed and its velocity. The speed of a moving object is a measure of how fast it is moving. Speed is equal to the distance the object travels divided by the time it takes to travel that distance. For example, a car that travels 30 miles in one hour has a speed of 30 miles per hour. Velocity describes how fast an object is moving in a certain direction.

Newton's Laws of Motion

In the 1680s the English scientist Isaac Newton came up with three laws that describe motion. In his first law, Newton explained that the motion of an object will not change unless a force pushes or pulls on the object. In his second law, Newton showed that a strong force makes an object move faster than a weak force acting on the same object. In Newton's third law, he said that whenever a force pushes an object, the object pushes back with an equal and opposite force.

► More to explore

Force • Newton, Isaac

Motorcycle

A motorcycle is a two-wheeled vehicle with an engine. Motorcycles are bigger,

heavier, and much faster than bicycles, but they have many similar parts. Like bicycles, motorcycles are often called bikes.

Motorcycles are a common form of transportation throughout the world. People also ride motorcycles in races or just for fun.

Motorcycle Design

Like an automobile, a motorcycle usually has an internal-combustion engine powered by gasoline. The body of the motorcycle, called the frame, is usually made of steel. Handlebars and a cushioned seat sit on top of the frame. The two tires are attached to the front and the back of the frame. They are much like car tires, but smaller.

Brakes, a headlight, a taillight, turn signals, and a horn are important safety features on every motorcycle. Some motorcycles have crash bars, which keep the motorcycle from hitting the ground if it falls over. A motorcycle might also have a windshield for protection.



Many motorcyclists wear protective gear, such as a helmet.

Motorcycles are designed for different purposes. Street bikes, touring bikes, and small mopeds and scooters are built mainly for riding on paved roadways. Touring bikes are specially equipped for long-distance highway travel. Lightweight dirt bikes, racing bikes, trail bikes, and minibikes are meant for off-road biking.

Using a Motorcycle

Motorcycle riders need their hands and their feet to drive their vehicles. The driver turns on the engine using a key. Once the engine is on, the driver uses controls on the handlebars and foot pedals to drive. A twist of a handgrip controls the speed of the vehicle. The handlebars also have a lever to control the front brakes. Pedals control the rear brakes.

Motorcyclists must obey the rules of the road and follow other laws related to motorcycles. Many countries require a special driver's license for operating motorcycles. In some places every motorcyclist must wear a helmet.

History

Many inventors in the 1800s tried to put engines on bicycles. These first motorcycles had steam-powered engines. In 1884 a British inventor put a gasoline engine on a three-wheeled motorcycle. By 1900 many people were building two-wheeled motorcycles with gasoline engines.

► More to explore

Automobile • Bicycle • Internal-Combustion Engine • Transportation

Mott, Lucretia



Lucretia Mott

Lucretia Mott helped to begin the movement for women's rights. She was also an early worker against slavery in the United States.

Early Life

Lucretia Coffin was born on January 3, 1793, in Nantucket, Massachusetts. When she was 13 her parents sent her to a Quaker school in Poughkeepsie, New York. She later became a teacher there. As a woman she received only half the pay that male teachers earned. She first became interested in women's rights because of this unequal treatment.

Lucretia married another teacher, James Mott, in 1811. The couple moved to Philadelphia, Pennsylvania, and had six children. Lucretia became a Quaker minister in 1821.

Career

In 1833 Lucretia Mott helped to start the American Anti-Slavery Society. In

Did You Know?

Mott helped to write a declaration of independence for women. It declared that "all men and women are created equal."

1840 the group sent her to a convention, or large meeting, in London, England. However, she was not allowed to take part because she was a woman. Many people were against equal rights for women at that time.

In 1848 Mott and Elizabeth Cady Stanton led the first convention for women's rights. It was held in Seneca Falls, New York. Mott also wrote many articles and gave many speeches in support of women's rights. In 1866 Mott became president of the American Equal Rights Association. This group worked for equal rights, especially voting rights, for all Americans.

Before the American Civil War Mott and her husband used their home as a stop on the Underground Railroad. The Underground Railroad was a system by which people helped runaway slaves escape to the North. After the Civil War Mott worked to get education and jobs for freed slaves. Mott died on November 11, 1880, near Abington, Pennsylvania.

► More to explore

Stanton, Elizabeth Cady • Underground Railroad • Women's Rights

Mound Builder

An amazing assortment of large mounds of earth lies in parts of the eastern United States. Some of the mounds are low, simple cone shapes. Others are tall, wide hills. Still others are shaped like huge animals. These mounds are not natural formations—Native Americans



The effigy mound called Serpent Mound was built by Native American mound builders in what is now the U.S. state of Ohio. The mound is shaped like a snake.

built them. Archaeologists call those people mound builders.

Three important groups of mound builders were the people of the Adena, Hopewell, and Mississippian cultures. They built many different types of mounds. Burial mounds were used as graves. They made these mounds by placing a body on the ground and building a hill of dirt and stones around it. In some burial mounds the bodies of many generations were layered on top of one another. Eventually the mound grew to look like a small hill.

Native Americans also built effigy mounds, which were shaped like such animals as snakes, bears, birds, and lizards. Some effigy mounds served as burial mounds. The purpose of other effigy mounds is unknown.

Other mounds provided platforms for religious temples or leaders' homes. The Cahokia Mounds in southern Illinois are

examples of platform mounds. The people of the Mississippian culture built those mounds, shaped like flat-topped pyramids, between about AD 900 and 1200.

► More to explore

Adena Culture • Hopewell Culture
• Mississippian Culture • Native Americans

Mountain

A mountain is a landform that rises high above its surroundings. Taller than a hill, it usually has steep slopes and a rounded or sharp peak. Mountains are rarely found alone. Groups of mountains are called ranges. Lines of ranges form mountain belts.

How Mountains Were Formed

Some mountains were formed by the activity of volcanoes. Scientists believe that most volcanic mountains are made up of rock that melted deep within Earth. The rock rose through Earth's surface, or crust. It then flowed onto the

surface in the form of lava. The lava, along with volcanic dust, built up to form mountains. Volcanic mountains are typically steep and cone shaped. Mount Fuji in Japan, Mount Kilimanjaro in Africa, and Mount Rainier in the United States are examples of volcanic mountains.

Other mountains were formed by movements within Earth's crust. The theory called plate tectonics explains this type of mountain building. Earth's crust is divided into huge pieces called plates, which move very slowly. The continents sit on top of the plates and move with them. At times the plates collide, forcing the rock upward. The Himalayas of Asia are an example of this type of mountain chain. They were formed when a plate carrying India collided with the Asian plate.

Living in Mountain Lands

Mountain ranges are natural barriers to travel. Roads are difficult to build across them. Railroads need expensive tunnels to cross even low mountains. Therefore mountain ranges tend to divide the people on either side of them. They often form borders between countries.

Life is hard in mountain lands. The high places of the world are cold and have little soil, making farming difficult. However, many mountain areas are vacation resorts. Skiing and climbing are popular mountain sports.

► More to explore

Fuji, Mount • Himalayas • Kilimanjaro, Mount • Plate Tectonics • Volcano

Did You Know?

Earth's highest mountain is Mount Everest. It is in the Himalayas, on the border between Nepal and China. It is 29,035 feet (8,850 meters) high.



Hiking is a popular mountain sport.

Mount Olympus

► see Olympus, Mount.

Mouse

Mice are small, gnawing mammals that belong to the rodent family. They can be found almost everywhere in the world. In many countries they are the most common animal.



The house mouse is a well-known type of mouse.

There are 38 species, or types, of mouse. The most commonly known is the house mouse. It is most often found in buildings. The house mouse grows to about 8 inches (20 centimeters) long from its nose to the tip of its tail. It has a scaly tail that is about half as long as its body. Its fur is brown or gray.

Mice live mainly on the ground and are active at night. Some types are good climbers while others are strong swimmers. They use their senses of smell and hearing to find their way around. House mice build their nests in hidden spots near food. Mice eat almost anything, including seeds, grains, and insects. Sometimes they eat human foods.

It takes about three weeks for a litter of house mice to be born. Each litter has about 1 to 18 young. A pair of mice can

give birth to 30 or 40 babies a year, even more if food is plentiful.

Mice are often considered pests. They can destroy food supplies and gnaw holes in homes. They also can spread disease. However, some people keep mice as pets.

► More to explore

Mammal • Rodent

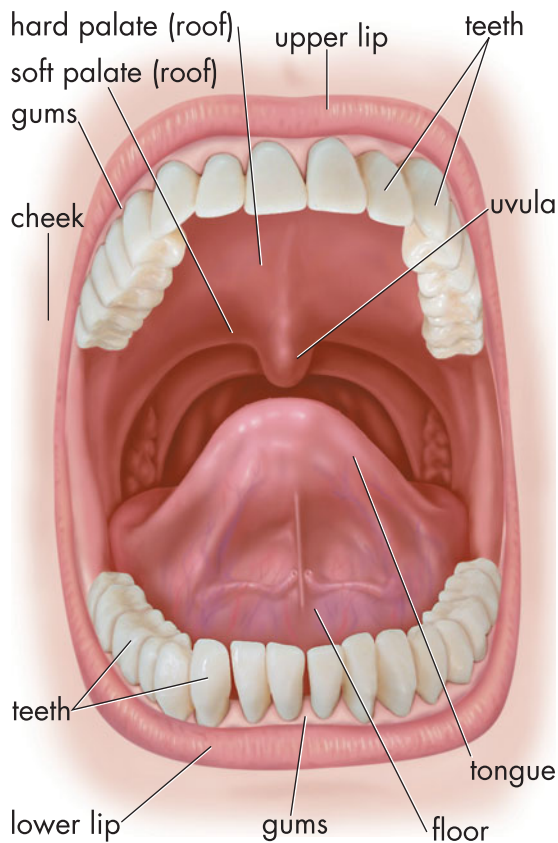
Mouth

In most animals, food enters the body through the mouth. The mouth is the opening to the digestive system. The digestive system is a group of body parts that breaks down food into fuel for the body.

In humans and many other animals, the mouth is the place where food is chewed and mixed with a clear liquid called saliva. The mouth is a way for air to enter the body, too. Human beings also use their mouths for speaking and for making facial expressions.

The Human Mouth

The human mouth includes several parts. The lips surround the outside edge of the mouth. The cheeks form the sides of the mouth, and the floor forms the bottom. Saliva enters the mouth through small tubes in the floor and the cheeks. The roof is the top of the mouth. It has two parts. The part in front is bone covered by flesh. The part in back is soft flesh. A small piece of flesh called the uvula hangs from the roof of the mouth in back.



Humans take in air and food through the mouth.

Behind the lips, two sets of teeth grow from the top and the bottom of the mouth. A person uses the teeth to chew food before swallowing it. Gums surround the teeth and connect them to the jawbone. The tongue helps to control food while chewing and to make sounds for speech.

Mouths of Other Animals

Animals have many different mouth shapes and structures. These different types of mouths allow each type of animal to eat a certain diet. Anteaters have small, tube-shaped mouths with no teeth. They use their long tongues to lick up insects. A hard beak surrounds the mouth of a bird. Insects have special features called mouthparts near their

mouths. Grasshoppers have jaws for chewing plants as well as mouthparts that hold food in place. Butterflies and moths have tubelike mouthparts to suck food into the mouth.

► More to explore

Digestive System • Teeth • Tongue

Movie

Movies are a form of entertainment that is popular all over the world. Movies are pictures that seem to move when shown on a screen. They are also called motion pictures or films.

Equipment

Making and viewing a movie requires special equipment. Two important pieces of equipment are the movie camera and the movie projector.

A movie camera records photographs, or pictures, on film. A movie camera takes many still pictures very quickly. Most movie cameras take 24 pictures every second. Because they are taken so close



Many people work together to make a movie.

together they catch very small differences in movement.

A movie projector makes the still pictures appear to move. As film runs through it, a projector flashes the pictures one after the other on a screen. The pictures go past the eye so quickly that the brain links them together as a moving scene.

The projector also plays the movie's sound track. The sound track contains all of the sounds of the movie, including talking, music, and sound effects. The sound track is a thin band that runs along the edge of the film, next to the pictures.

Movie theaters receive reels of film. A typical film is five or six reels long. Theaters usually join the reels together to make larger reels. Then one or two projectors play the reels to show the movie on the screen.

People Who Make Movies

Making a movie takes many people. The producer handles the business matters. The producer raises money for making the movie and hires people, including the screenwriter and the director. The screenwriter puts the story together and writes what the actors will say.

The director turns the written story into a movie. The director works with almost everyone involved in making the movie. The director helps the producer choose the actors and actresses who appear in the movie. During filming, the director decides how scenes are filmed and tells



Chinese director Chen Kaige works on editing his movie *Temptress Moon*.

others what to do. The director oversees the people who handle costumes, makeup, lighting, sound, and cameras.

Some members of a film crew create special effects. Special effects are tricks used to film things that would otherwise be too difficult or expensive to film. For example, miniature models of buildings or vehicles can be used to film such events as earthquakes, floods, fires, and explosions.



A model maker creates a make-believe creature for the movie *The Return of the Jedi*. With the help of special effects, the creature will appear to move in the finished film.

Did You Know?

The United States has a rating system that prevents children from seeing certain movies. No child can see a movie rated NC-17.

After the filming is done, editors put the pictures and sound together. Usually the director films a lot of material that will not fit in the final movie. Film editors work with the director to cut scenes and move others around. Sound editors make sure that the sound track fits well with the pictures.

History

People began experimenting with ways of making and viewing moving pictures in the 1800s. By 1890 the U.S. inventor Thomas Edison had developed a movie camera. In France, Louis and Auguste Lumière invented a combined movie camera and projector in 1895. The Lumière brothers opened the world's first movie theater in Paris, France.

In the early 1900s France was the center of the movie industry. But by 1920 most movies were made in the United States. Big movie studios were set up in Hollywood, a part of Los Angeles, California.



A film crew works on a model of a ship used in the movie *Titanic*.



Computers were used to add many special effects to the Spider-Man movies of the early 21st century.

Early movies did not have color or sound. *The Jazz Singer*, released in 1927, was the first popular movie with sound. The first high-quality color movies were made in the 1930s.

Television became popular in the 1950s. As a result, people saw fewer movies. In the 1970s, big movies such as *Star Wars* brought some people back into theaters.

Film technology changed in the late 20th century. New cameras recorded pictures as digital data instead of using film. Digital recording was also used for sound. Computers were used to produce amazing visual effects. Some animated movies, such as *Toy Story* (1995), were made entirely with computers.

► More to explore

Animation • Camera • Cartoon

- Disney, Walt • Edison, Thomas Alva
- Photography • Television



Mozambique

The country of Mozambique sits on Africa's southeastern coast. Mozambique's capital is Maputo.

Geography

Mozambique shares borders with Tanzania, Malawi, Zambia, Zimbabwe, South Africa, and Swaziland. The Indian Ocean lies to the east.

The Zambezi River divides Mozambique into northern and southern regions. The south has mostly lowlands and some highlands. The north has high plains and mountains. Mozambique has warm weather all year.

Plants and Animals

Ironwood, palm, and ebony trees grow in the northwest. Grasses and shrubs grow in the drier south. Mozambique's rich wildlife includes zebras, hippopotamuses, lions, elephants, crocodiles, and giraffes.

Facts About MOZAMBIQUE



Population
(2008 estimate)
21,285,000

Area
313,661 sq mi
(812,379 sq km)

Capital
Maputo

Form of government
Republic

Major cities
Maputo, Matola,
Beira, Nampula



People

The largest of Mozambique's many ethnic groups include the Makua, the Tsonga, the Sena, and the Lomwe. Portuguese is the national language, but most people speak African languages. About half of the people follow traditional religions. There are also many Christians and Muslims.

Economy

Most of Mozambique's people make their living by farming. Corn and cassava are the main crops. Mozambique also produces shrimp, coconuts, cotton, sugarcane, cashew nuts, and wood. Factories make aluminum, food products, beverages, cloth, and chemicals.

History

Bantu-speaking peoples moved to the region in about the AD 200s. Arabs later set up trading cities along the coast. The Portuguese settled in the region in the 1500s. They sold many Mozambicans as slaves.

In 1964 a rebel group called Frelimo began to fight Portuguese rule. Mozambique won independence in 1975. Frelimo took over the government. Rebels soon began fighting Frelimo's government. That deadly civil war lasted until 1992. Mozambique held democratic elections in 1994.

► More to explore

Maputo

Mozart, Wolfgang Amadeus



Wolfgang Amadeus Mozart

Mozart was a brilliant composer of classical music. He wrote many different types of music and excelled in every one. During his short life he composed more than 50 symphonies and 15 operas. He also wrote many works for choir, orchestra, and smaller groups of instruments. Although they are more than 200 years old, his compositions are still very popular.

Child Genius

Wolfgang Amadeus Mozart was born on January 27, 1756, in Salzburg (now in Austria). At age 4 he began playing a keyboard instrument called a harpsichord. At age 5 he composed his own pieces. A year later his father began taking him and his sister to perform concerts throughout Europe. Mozart

played the violin, organ, piano, and harpsichord.

Mozart mastered the styles of music that were popular in different cities in Europe. He also published his first musical compositions. His first opera was performed in Salzburg in 1769, when he was just 13.

Mature Career

Mozart worked in Salzburg for a few years. First he was an assistant conductor. Later he was an organist. During this time he produced a number of religious works. He also wrote his first serious opera. It was first performed in 1781, just after Mozart's 25th birthday.

Later that year Mozart moved to Vienna. He was successful there as a pianist and composer. But he spent more money than he earned. He had financial problems for much of his life.

In Vienna Mozart wrote some of his best works for piano and orchestra. During his last years he wrote some of his greatest symphonies and operas. His most popular operas include *Le nozze di Figaro* (The Marriage of Figaro), *Don Giovanni*, and *Die Zauberflöte* (The Magic Flute). In 1791 Mozart began working on a mass for the dead, called a requiem. But he fell ill and died before completing it. Mozart died on December 5, 1791, in Vienna.

► **More to explore**
Classical Music • Opera

Did You Know?

Mozart composed a symphony (an orchestra piece that is long and has several parts) at age 8.

Mughal Empire

The Mughal Empire ruled most of northern India from the 1500s to the 1700s. The Mughal rulers practiced the religion of Islam. Most of the people they ruled practiced Hinduism. Even so, the Mughals were able to rule successfully. They worked to bring Muslims and Hindus together into a united India.

The founder of the Mughal Empire was named Babur. He was descended from Genghis Khan, who had founded the Mongol Empire in Mongolia more than 300 years earlier. In 1526 Babur conquered the Indian sultanate, or kingdom, called Delhi. By his death in 1530 he controlled much of northern India.

The next great Mughal ruler was Babur's grandson Akbar. He ruled from 1556 to 1605. Akbar led conquests that greatly expanded the empire. He married a Hindu princess and let non-Muslims practice their beliefs. He also encour-

aged art and learning. Because of his accomplishments, he is also known as Akbar the Great.

Akbar's grandson Shah Jahan was the next notable Mughal ruler. He reigned from 1628 to 1658. He is best known for building the beautiful Taj Mahal in the city of Agra.

Shah Jahan's son Aurangzeb ruled from 1658 to 1707. He expanded the empire to its greatest size. But he mistreated Hindus and other non-Muslims. This cost him the support of the people. Some groups rebelled against him. The empire gradually became weaker.

By the middle of the 1700s the Mughals ruled only a small area around the city of Delhi. The British took over this land in 1803. The last Mughal emperor was Bahadur Shah II. The British allowed him to reign until 1857. Then they forced him to leave India.

► More to explore

India • Islam • Taj Mahal



The Mughal ruler Humayun is buried in a large tomb in Delhi, India. Humayun was the father of Akbar, one of the greatest Mughal emperors.

Muhammad

The prophet Muhammad was the founder of the religion of Islam. Followers of Islam, called Muslims, believe that Muhammad received messages from Allah (God). These messages were later collected into the Koran, the holy book of Islam.

Early Life

Muhammad was born in the Arabian town of Mecca (now in Saudi Arabia) in



The Islamic statement of faith is written in Arabic letters on a palace wall in Istanbul, Turkey. The statement includes the name of Muhammad.

about 570. Muhammad's father died before Muhammad was born, and Muhammad's mother died when he was 6. He was then raised by his grandfather and later by his uncle.

When Muhammad was about 25 years old, he married a rich, older woman named Khadijah. Their marriage helped Muhammad gain wealth and social standing, and they had six children. Although many men at the time had more than one wife, Khadijah was Muhammad's only wife until after her death.

Beginnings of Islam

According to tradition, in about 610 Muhammad had a vision (thought to be of the angel Gabriel) and heard a voice tell him, "You are the messenger of God." At various times during the rest of his life, Muhammad received verbal messages that he believed came directly from God.

Muhammad began preaching in Mecca in about 613. He told people they should worship only one God, which was different from the Arab practice of worshipping many gods. He also told people to be generous as a way of expressing their appreciation to God. His new religion came to be called Islam, meaning "submission to God."

Leaving Mecca

Many people in Mecca were against the new religion. Those who believed in several gods were afraid that their holy places might be destroyed. Merchants disliked Muhammad because he criticized them for being greedy.

Muhammad worried that his enemies might hurt him and his followers, so he encouraged his followers to move to the nearby city of Medina. Muhammad himself reached Medina on September 24, 622, which is considered the starting date for the history of Islam. Muhammad's trip to Medina is known as the Hegira.

Uniting the Tribes

Most Arabs at the time were part of large groups called tribes. Muhammad was determined to join the many Arab tribes together under Islam. He hoped that by uniting they could use their military strength to spread Islam to other areas.

To achieve his goal, Muhammad had to get the support of Mecca. From 622 on, he and his followers fought several battles with forces from Mecca. By the time Muhammad and his forces entered

Did You Know?

Muslims are not allowed to make images, or pictures, of Muhammad.

Instead, Islamic artists write his name in beautiful script.

Mecca in 630, many notable citizens had already moved to Medina to become Muslims. Mecca gave up with little fight.

Muhammad died on June 8, 632, in Medina. He left most of Arabia united and ready to spread the faith. But after his death, his followers could not agree on who should lead them. This led to the breakup of Islam into different branches.

► More to explore

Arabs • Islam • Koran • Mecca

Mumbai



Population
(2001 estimate),
city,
11,914,400;
metropolitan
area,
16,368,100

Mumbai is the largest city in India, a country in southern Asia. The city was once called Bombay. It is one of the most populated cities in the world. Its millions of people are crowded onto an island in the Arabian Sea. Bridges connect the city to the nearby mainland of India. Mumbai Island was once seven separate islands, but engineers made them into one island.

Mumbai is India's center of banking, business, and other services. It is also home to the world's largest motion pic-

ture industry. The film industry is called Bollywood, from the names Bombay and Hollywood. The city is also a major port for shipping India's goods out for sale to other countries. Engineering, publishing, computers, communications, and manufacturing also bring money to Mumbai.

In ancient times the Mumbai area was the site of small fishing villages of the Koli people. Later the area fell under the rule of Hindu and then Muslim powers. In 1534 the Portuguese took over the area. They founded the city as a trading post, which became known as Bombay.

In 1661 the Portuguese gave Bombay to the British. Great Britain eventually ruled all of India as a colony. In the



An arch called Gateway of India is Mumbai's most famous monument.

1800s Bombay grew along with its trade and cloth-making industry. It later became a center for the political movement that worked to free India from British rule. India became an independent country in 1947. In 1995 Bombay was renamed Mumbai, which is its name in the local Marathi language.

► More to explore

India

Mummy

A dead body that has been preserved with chemicals is called a mummy. The Inca of Peru made mummies. Ancient peoples in Australia and on some Pacific islands did also. However, the ancient Egyptians are the best-known makers of mummies.

The Egyptians made mummies for more than 3,000 years. The methods they used changed over the centuries. During the New Kingdom (1500s–1000s BC), Egyptians mummified dead kings and nobles in a process that took 70 days.

Funeral workers started the process by removing the brain and all the inner organs except for the heart. They packed the organs in jars. Next, they soaked the body in salt or chemicals to remove the fat and the outer part of the skin. After the body dried out, they treated both the inside and the outside with spices and preservatives. Then they wrapped the body in linen bandages. Egyptians often painted the wrappings with religious symbols and a portrait of the dead person's face. Finally, they placed the



Scientists prepare to X-ray a 3,000-year-old Egyptian mummy. Scientists use X-rays to learn more about mummies without taking apart the wrappings.

mummy in a carved and painted wooden coffin.

The Egyptians did not use this process for the bodies of poor people. They merely dried them with salt and wrapped them with coarse cloths. The Egyptians also mummified certain animals, especially cats.

Mummies had a religious purpose. Ancient Egyptians believed that dead people needed their bodies in order to pass successfully into the next world. They thought that as long as the body was preserved, the soul could live.

► More to explore

Egypt, Ancient

Mumps

Mumps is a very contagious, or catching, disease that causes swelling in the face. It is caused by a virus. Although mumps can infect adults, it is most com-



Mumps causes the glands near the ears to swell.

mon in children between the ages of 5 and 15.

The mumps virus infects the glands that make saliva. Any contact with the saliva of an infected person can spread the disease. Also, an infected person can spread the virus into the air by coughing or sneezing. Another person who breathes that air can get the disease.

The first symptoms, or signs, of mumps may be a runny nose and a low fever. These symptoms usually do not appear until two to three weeks after the person is infected. Soon the area in front of each ear becomes swollen and puffy. The swelling can spread to the upper neck and jaw. In some cases mumps leads to swelling of the brain.

Mumps needs no special treatment. The symptoms start to go away after four or five days. Because mumps spreads easily, infected people should stay home. They should also get plenty of rest.

A person who has been infected with mumps usually develops immunity to the disease. This means that the person will not get mumps again. Children are often given a shot of a substance called a vaccine to keep them from getting the disease.

► More to explore

Vaccine • Virus

Muscat



Population
(2007 estimate), city, 28,987; urban area, 785,515

Muscat is the capital of Oman, a country in the Middle East. The city is partly surrounded by mountains. It has a natural harbor on the Gulf of Oman.



Muscat, the capital city of Oman, is located on the Gulf of Oman.

Oman's largest oil company has its headquarters in Muscat. A stock exchange was opened in the city in 1989. Just outside Muscat are Oman's main centers of trade (Matrah) and business (Ruwi).

In ancient times Muscat was under Persian rule. It became an important trading port. Portugal controlled the city from 1508 to 1650. The Portuguese established a trading post and naval base there. Two Portuguese forts from the 1500s still overlook Muscat. Persians again ruled the city from the mid-1600s to the mid-1700s. The family that rules Oman today then took over the area. The family made Muscat its capital.

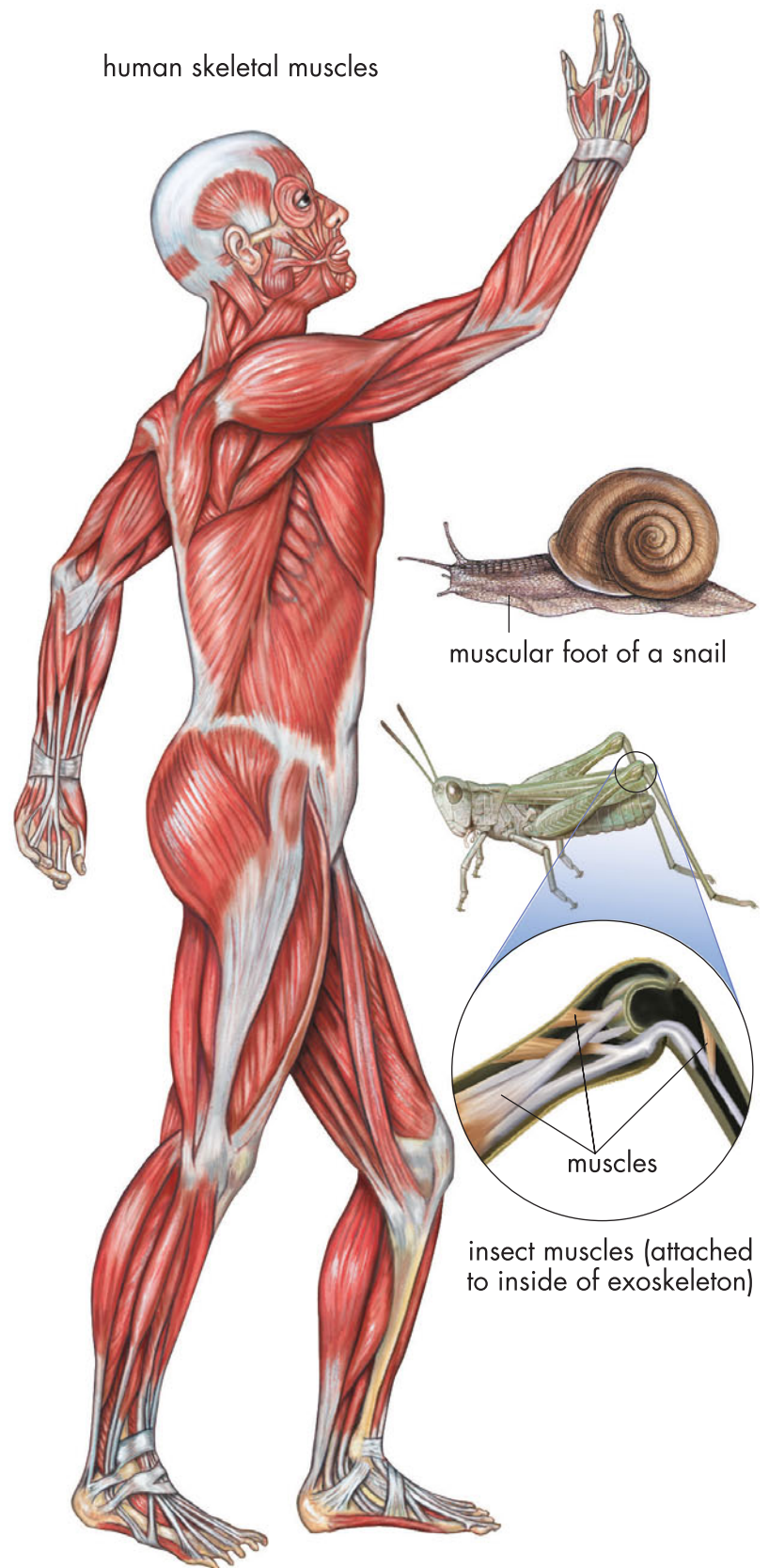
► More to explore

Oman

Muscle

Muscles make it possible for animals to move. Worms move by tightening and relaxing their muscles in waves. Snails and clams crawl with the help of a big muscle called a foot. Insects move their legs and wings with muscles hidden under their exoskeleton, or hard covering. Fish, reptiles, birds, and mammals move with the help of muscles connected to their skeleton.

Muscle connected to a skeleton is called skeletal muscle. Animals with backbones, including humans, also have two other types of muscle: cardiac muscle and smooth muscle. Cardiac muscle



Muscles help animals move.

makes blood flow. Smooth muscle helps to digest food.

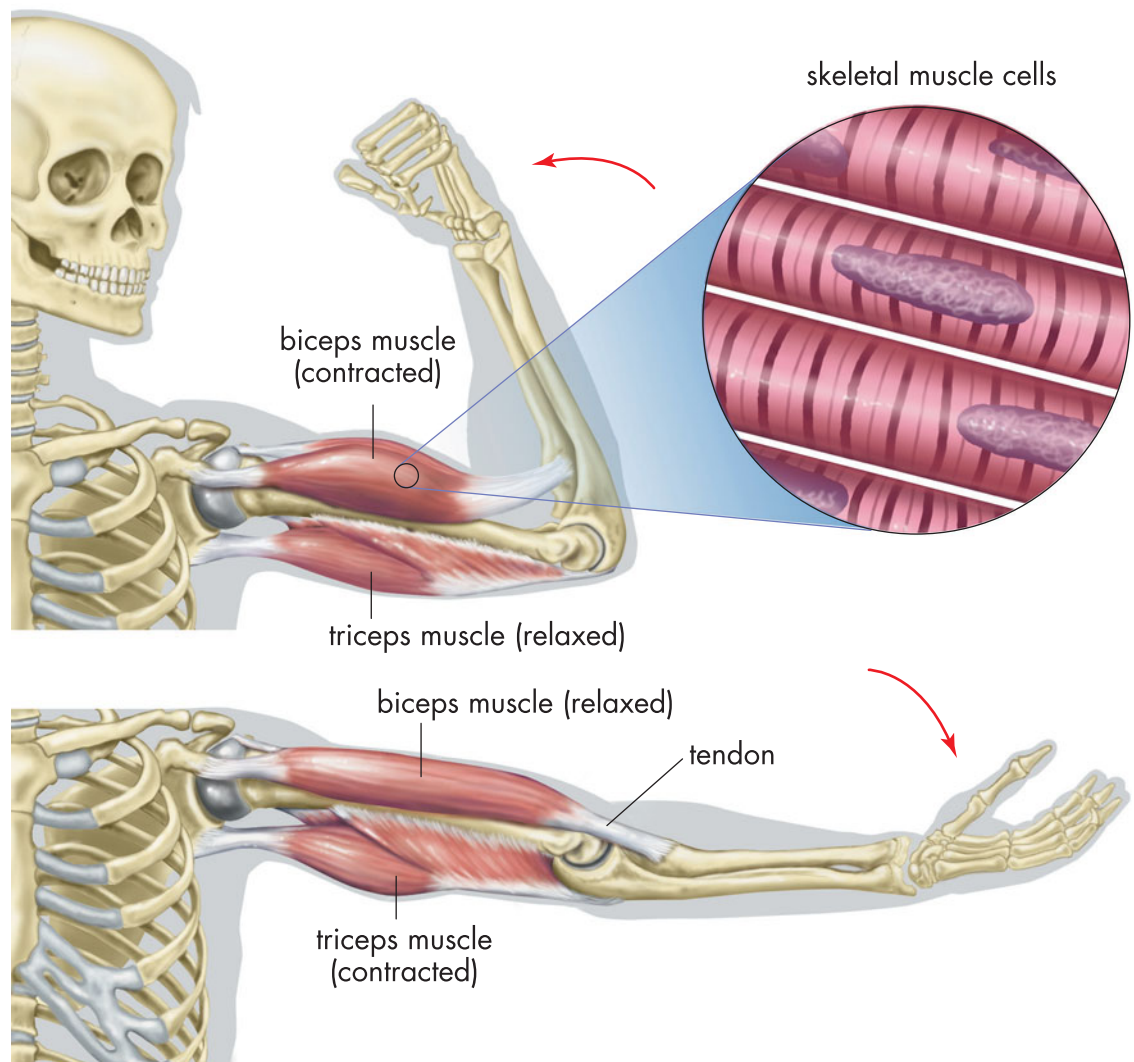
Skeletal Muscle

Skeletal muscle lies under the skin. It is made up of long threads, or fibers. Skeletal muscle controls movement, posture (position of the body), and balance. A person can move skeletal muscle just by thinking about it and then doing it.

Cordlike structures called tendons connect skeletal muscle to the skeleton. As skeletal muscle tightens, or contracts, it

gets shorter. It pulls on the bones attached to it. As the muscle relaxes, it gets longer. It lets the bones fall back into place. In this way skeletal muscle makes the bones move the parts of the body.

To make skeletal muscle move, the brain sends a message along a type of nerve called a motor nerve. Motor nerves end in the fibers of the muscle. There the nerves release chemicals that start a wave of electrical and chemical activity. This activity creates energy that moves the muscle.



Skeletal muscle makes bones move parts of the body.

Some of the energy also goes into the body as heat. This means that muscle movement helps to keep the body at the right temperature.

Cardiac Muscle

Cardiac muscle is located in the heart. The fibers of this muscle form a structure like a net. The fibers form the chambers, or hollow areas, of the heart. As the cardiac muscle contracts and relaxes, blood moves in and out of the chambers.

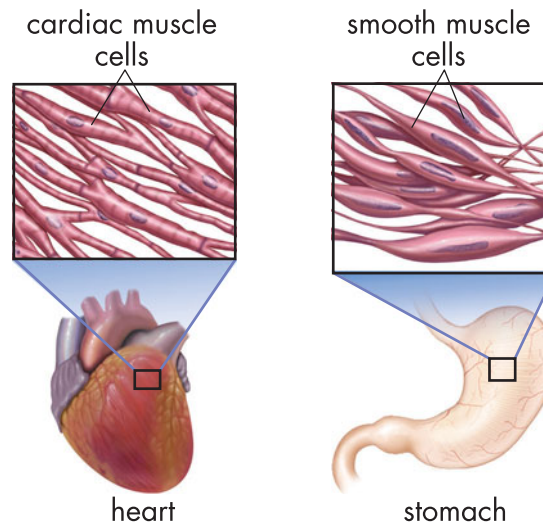
Cardiac muscle is involuntary muscle, which means that it moves automatically. A person does not have to think about telling the heart to beat. The cardiac muscle does not have nerves to tell it to move, either. A special strip of cardiac muscle releases bursts of electricity that help the heart to beat in a regular rhythm.

Smooth Muscle

Smooth muscle helps to move food through the digestive system. It lines the intestines and the stomach. Smooth muscle also moves the diaphragm, which helps with breathing. Smooth muscle makes blood vessels tighten and relax, too. Like cardiac muscle, smooth muscle is involuntary muscle. The nervous system and body chemicals control the actions of smooth muscle.

Problems with Muscles

Using skeletal muscle too much during work or exercise can cause pain. If a muscle stretches too far, it can tear. This is called a muscle strain, or a pulled



Cardiac muscle is located in the heart (left). Smooth muscle is located in the intestines and the stomach (right).

muscle. Skeletal muscle can also cramp (stay tightly contracted) or twitch (move by itself). Muscular dystrophy is a disease that causes muscles to grow very weak over time.

► More to explore

Digestive System • Heart • Skeletal System

Muse

In ancient Greek and Roman mythology the Muses were nine sister goddesses. They inspired people in the arts and sciences. Before poets or composers in ancient times began any great work, they asked the Muses for help. The word museum comes from a Greek word meaning “place of the Muses.”

According to legend, the father of the Muses was Zeus, the chief god. Their mother was the goddess of memory, named Mnemosyne. In stories the



In works of art, each Muse was usually shown holding a symbol of her specialty, such as a scroll or a musical instrument.

Muses were often companions of Apollo, the god of music and prophecy (predicting the future).

The nine Muses were said to help people sing, dance, and write poetry. Each one had a specialty. Statues of the Muses were a popular decoration in ancient Greece and Rome. Sculptors often showed each Muse holding a symbol of her specialty.

► More to explore

Apollo • Mythology • Zeus

Museum

A museum is a building that holds a collection of objects that are found in nature or objects that people created. Many museums focus on a single subject—for example, art, science, or history.

How Museums Work

Most museums are open to the public. People visit museums to view the collections. The collections educate people about the natural world or human culture. Museums also may offer guided tours, lectures, and special events. Scientists and other scholars sometimes use museums to do research.

Museums add to their collections by buying objects or receiving donations. Museums display some objects all the time. They also display certain objects for a limited time. These displays may include objects borrowed from other museums or from private collectors. Many museums own objects that are never on display at all. Only researchers may view these objects.



Visitors to art museums can see many different types of art in one place.

Types of Museums

Art museums contain collections of paintings, sculptures, and other important works of art. Some art museums' collections cover many different styles and periods of history. Others specialize in artworks from a particular time period or a single art style, such as modern art.

Science museums use their collections to explain different areas of science and technology. Their collections often include machines and tools from the past and present. They may teach people about space travel, medical advances, electronics, or other scientific subjects.

History museums collect objects, called artifacts, that show what human life was like in the past. Artifacts may include clothing, tools, housewares, vehicles, old photographs, and many other kinds of objects. Natural history museums display samples of plants, animals, rocks, and other natural objects.

Some museums have very specific collections. The National Baseball Hall of Fame and Museum in Cooperstown, New York, is one example. Another example is the Rock and Roll Hall of Fame and Museum in Cleveland, Ohio.

History

Since ancient times people have collected objects. For example, religious groups throughout the world collected religious artwork and artifacts.

In the 200s BC a king founded a museum and library in Alexandria, Egypt. But this place was more like a university than a modern museum.

Many modern museums developed from the collections of wealthy people in Europe. During the Renaissance (1300s–1500s), Europeans built large collections of art and historical objects. By the 1600s the owners of some private collections had sold their objects to cities, universities, or other public places.

Two of the world's most famous museums today began as private collections. The British Museum in London,



An exhibit at a science museum teaches children how clouds form.



The remains of a dinosaur nicknamed Sue are on display at the Field Museum of Natural History in Chicago, Illinois.

England, opened to the public in 1759. It contains many archaeological treasures. The Louvre in Paris, France, opened to the public in 1793. It contains many famous works of art. By the late 1800s many countries around the world had built museums.

In the 1900s several new types of museums appeared. They included collections of buildings that re-created whole towns or neighborhoods. Colonial Williamsburg in Virginia is one example. It shows what life was like in the English colonies long ago. Many cities also opened museums designed especially for children.

► **More to explore**
Library

Music

Music is a group of sounds that people have arranged in a pleasing or meaningful way. All cultures of the world make

some form of music. Music can be simple—for example, one person tapping out a beat on a log drum or singing a children's song. Music can also be complex—for example, hundreds of instruments playing together for hours.

The Elements of Music

All music includes basic elements, or parts. The main elements of music are rhythm, melody, harmony, and form.

Rhythm describes the length of musical sounds. The most important part of rhythm is the pulse, or beat. When you tap your foot to a song you like, you are tapping out the beat. The speed of the beats is called the tempo. The pattern of the beats is called the meter. Drums help other instruments and voices keep the rhythm in many songs.

Melody is a series of different tones, or sounds, in a piece of music. The tones



Most musicians learn to read music.

are played or sung one after another to make up a song. The tones in a melody may be low or high. The highness or lowness of a tone is called its pitch. Musicians describe different tones with the letters A, B, C, D, E, F, and G.

Harmony takes place when people play or sing more than one tone at the same time. Groups of tones played together are called chords. Harmony also describes the way chords go along with a melody.

Form is the way that people put rhythm, melody, and harmony together. There are many different types of musical forms. Repeating a short melody is one of the simplest forms. For example, in the song “Mary Had a Little Lamb,” each verse repeats the same melody. A symphony is a more complex form. In a symphony, different groups of instruments may play different melodies at the same time or a series of harmonies. The rhythm may also change—for example, the tempo may be fast or slow at different points in the symphony.

Musical Notation

Some musicians make up music as they perform. Others sing songs or play pieces that someone else created. Musicians have developed a system for writing down music so that others can play it again. They use certain symbols, called notes, to indicate the tones to be played or sung. The arrangement of the notes shows the order in which the tones should be played. Other numbers and symbols show how fast to play each



Children learn about music as they play the xylophone.

note. All of these numbers and symbols together are known as musical notation.

Musical Instruments

People use their voice to sing. To make other kinds of music they use many different musical instruments. Most musical instruments fall into one of four groups. Stringed instruments, such as violins and harps, have tight strings that make sounds when people pluck or rub them. Wind instruments, such as trumpets and saxophones, make sounds when people blow into them. Percussion instruments, such as drums and rattles, make sounds when people hit or shake them. Keyboard instruments, such as pianos and accordions, make sounds when people press their keys, buttons, or levers.

Types of Music

Most cultures make different types of music. Some music goes along with religious ceremonies. Other music is a part of everyday life. The traditional music made by everyday people is called folk music.

Classical music is a formal and artistic music that developed in Europe over hundreds of years. Orchestras, choirs, and chamber ensembles (small groups of musicians) often perform classical music. Opera is a type of classical music that features dramatic singing.

When large numbers of people enjoy a type of music, it is called popular music. Popular music is usually shorter and simpler than classical music. People often buy recordings of popular music or listen to it on the radio. Some of the many types of popular music are rock, country, hip-hop and rap, the blues, jazz, and world music.

► More to explore

Blues • Classical Music • Country Music
• Folk Music • Hip-Hop • Jazz • Opera
• Popular Music • Rap • Rock Music
• World Music

Musical Instrument

An object that can be used to produce music is called a musical instrument. A musical instrument may be as large and complicated as a pipe organ or as small and simple as a tiny bell or whistle. Musical instruments are found in almost all cultures and periods of history. Scientists have found clay drums and shell trumpets that were used thousands of years ago by some of the earliest humans.

Musical instruments have great power to stir human feelings, and they have been



A girl plays a panpipe called a *rondador* in the South American country of Ecuador. A *rondador* is a wind instrument.

used in a variety of ways. In some places they are thought to have magical powers. Drums have been used to chase away evil spirits in many cultures. Religions around the world use instruments in worship services and to mark special



A man in the African country of The Gambia plays a stringed instrument with a long, thin neck.

Did You Know?

The talking drums of West Africa can be heard over a distance of 20 miles (32 kilometers).

holy times. Musical instruments have been used to announce the arrival of kings as well as to inspire soldiers in battle. Of course, they also are played for pleasure and entertainment.

Instruments can be played individually or in groups. In many types of music, a group of musicians playing together is known as a band. In Western classical music, music produced by a small group of musicians is called chamber music. A larger group is known as an orchestra.

Percussion Instruments

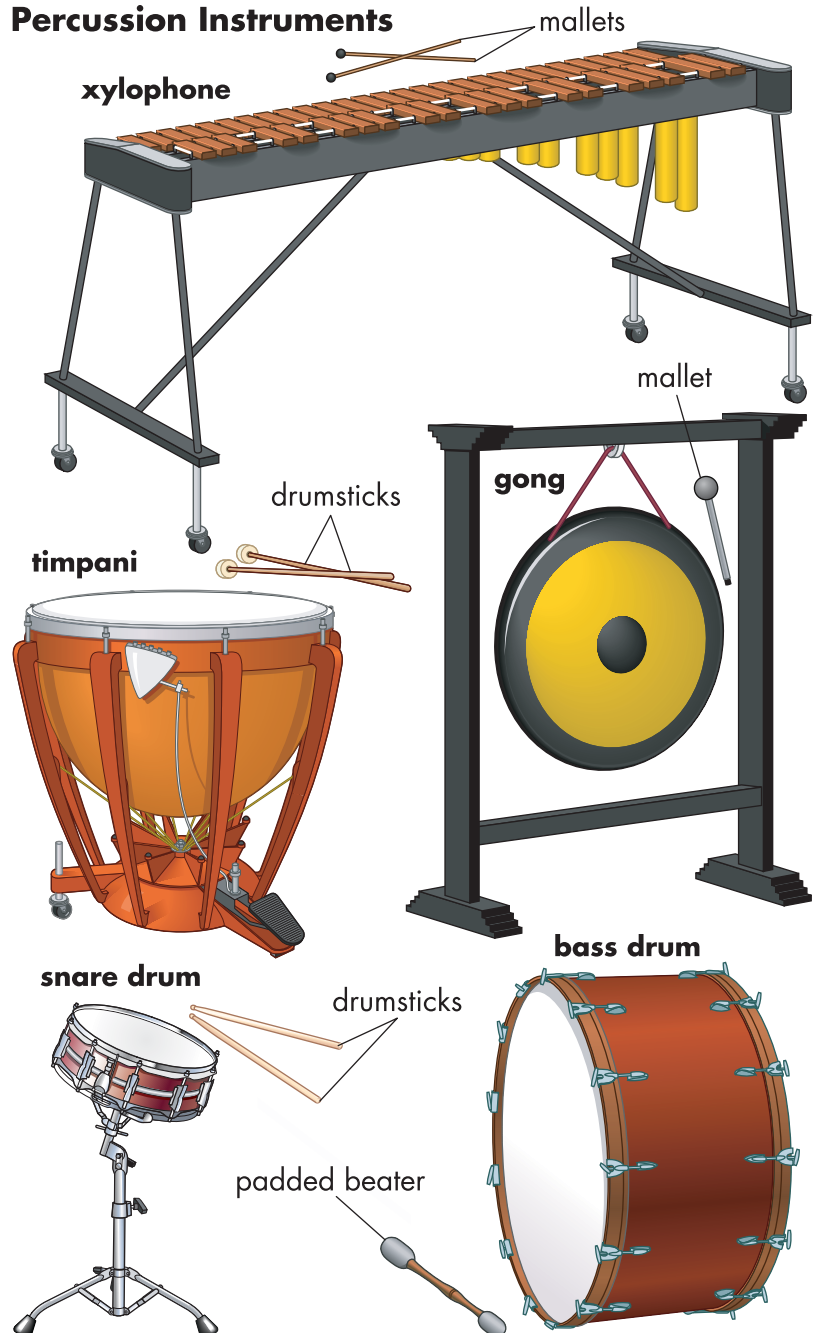
Most percussion instruments are used to establish rhythm. Percussion instruments make a sound when they are struck, shaken, scraped, plucked, or rubbed. They include cymbals, castanets, bells, gongs, rattles, xylophones, and drums. Drums have a stretched skin that vibrates when struck or rubbed. They can be beaten with the hands or with other objects, including sticks.

Stringed Instruments

Stringed instruments make use of a stretched string that vibrates when plucked, struck, or rubbed with a bow. They are divided into categories based on how the strings are attached to the body of the instrument. The main categories are harps, lutes, zithers, and lyres. A harp has many strings, each of which produces a different note. The length of the string determines the sound that the string makes. The shortest strings produce the highest notes.

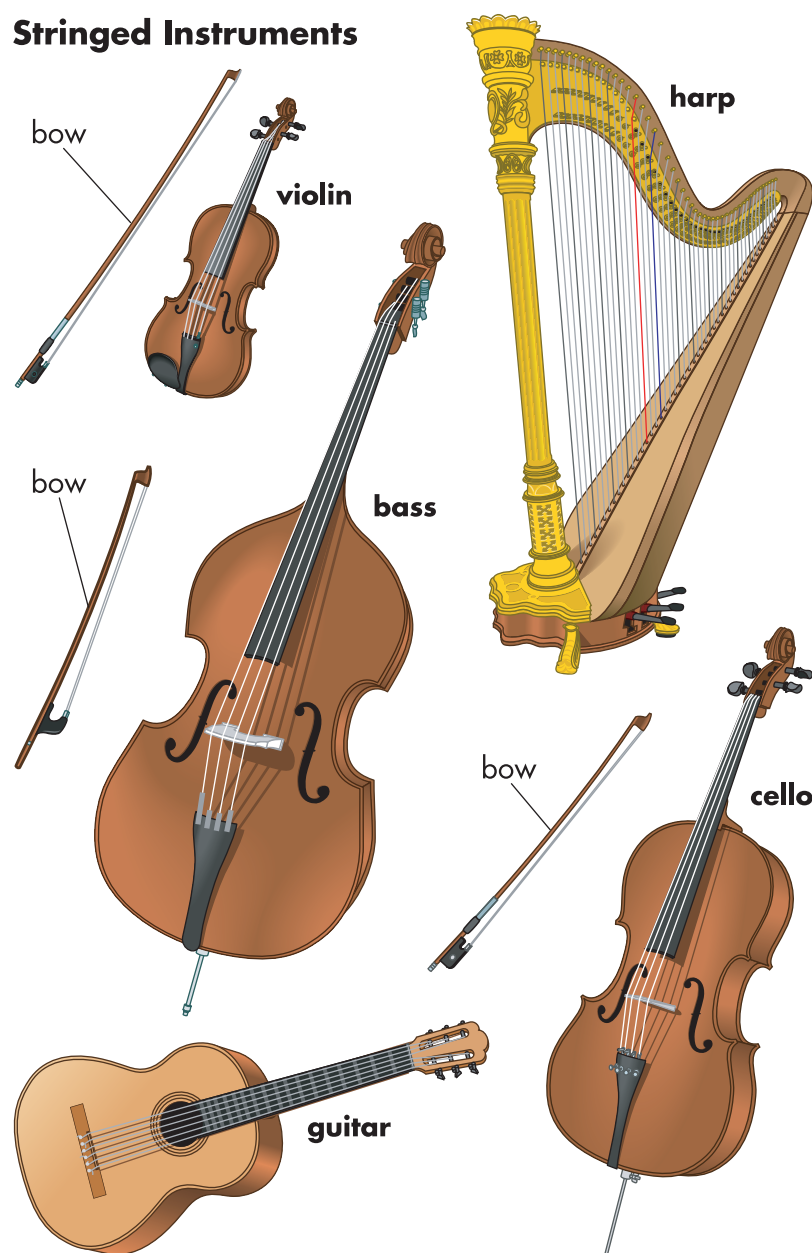
The basic stringed instruments of the modern symphony orchestra are in the lute family. This means that the strings are stretched over a long neck that extends from the body of the instrument. These instruments include (from smallest to largest) the violin, viola,

Percussion Instruments



Percussion instruments include the xylophone, the timpani, the gong, the snare drum, and the bass drum.

Stringed Instruments



Stringed instruments include the violin, the guitar, the cello, the double bass, and the harp.

cello, and double bass. The strings are plucked with the fingers or rubbed with a bow, which is a curved stick with horsehair stretched between the ends. Unlike a harp, these instruments have only four or five strings each. The sound is changed by using the fingers to press down on the strings at different points of the neck. In effect, this temporarily shortens the part of the string that

makes the sound. The wooden body of the instrument makes the sound louder.

Guitars, banjos, and sitars also belong to the lute family. They are played by plucking the strings with either the fingers or a small piece of plastic or metal called a pick. The electric guitar uses an electronic device called an amplifier to make the sound louder.

Wind Instruments

In wind instruments the sound is created by a stream of air that flows through or around the body of the instrument. In most cases the air comes from the player's mouth. In modern Western orchestras wind instruments are divided into brass instruments (made of brass or other metal) and woodwinds (made of wood or metal). Brass instruments include the trombone, trumpet, horn, and tuba.

Many of the woodwinds produce sound when air causes a thin blade of cane or metal, called a reed, to vibrate. The clarinet and saxophone each have one reed, while the oboe and bassoon use two reeds each. The flute and piccolo are woodwinds that have no reeds. In woodwinds the player can produce different sounds by pressing on keys or finger holes. This changes the way the air vibrates as it flows through the body of the instrument.

People throughout the world play different types of flutes, including the whistle flute, panpipes, and recorder. A bagpipe, another form of wind instrument, has two or more pipes with reeds. Air is

Wind Instruments



Wind instruments include the woodwinds, such as the flute, the clarinet, the oboe, and the bassoon. Wind instruments also include brass instruments, such as the trumpet, the horn, the trombone, and the tuba. The saxophone is considered a woodwind, but it may be made of brass.

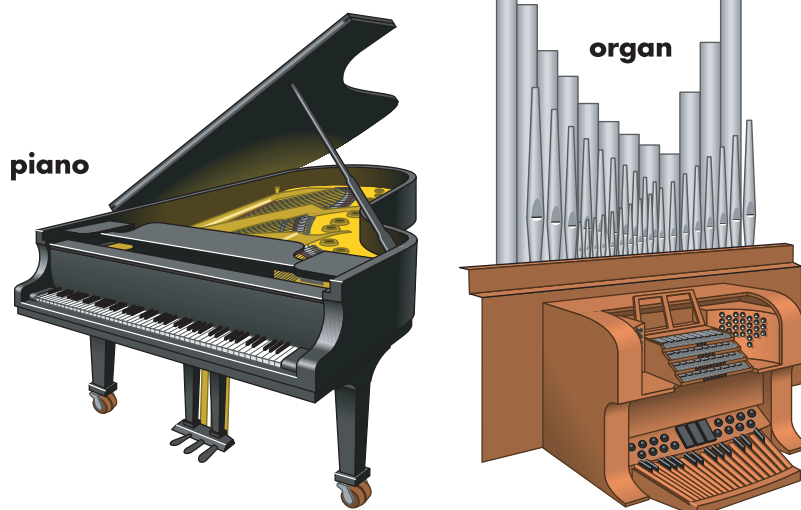
forced from a bag through the pipes, causing the reeds to vibrate. One of the pipes has finger holes used to play particular notes.

a bellows. This pushes air past reeds to make the sound. The electronic organ

Keyboard Instruments

To play a keyboard instrument, a musician presses down on keys. The keys control a mechanism that produces sound. Strings make the sound in both the piano and harpsichord. The strings of a piano are struck with hammers, while the strings of a harpsichord are plucked. In the pipe organ compressed air is pumped through pipes to make the sounds. Similarly, in the accordion the musician pushes on a pleated box called

Keyboard Instruments



Keyboard instruments include the piano and the pipe organ.

and the synthesizer make many different kinds of electronic sounds.

► More to explore

Music • Orchestra

Muskogee

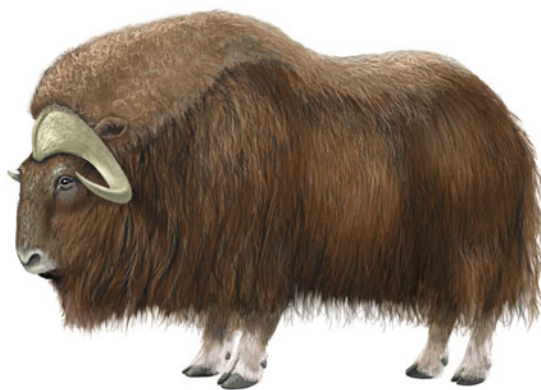
► see Creek.

Musk-ox

The musk-ox is a large, shaggy mammal of the Arctic. It is not really an ox at all. Rather, it is related to sheep and goats. The scientific name of the musk-ox is *Ovibos moschatus*.

The musk-ox roams the tundra (treeless plains) of Alaska, Canada, and Greenland. It usually travels in herds of 20 to 30 animals. It feeds on grass and other plants.

The musk-ox looks like a small bison. It has a large head, a short neck, and short, stout legs. Males, called bulls, can be 7.5 feet (2.3 meters) long and weigh 900



The musk-ox is not really an ox (a type of cattle). It was named for its smell, called musk.

pounds (410 kilograms). Females, called cows, are smaller.

The fur of the musk-ox is dark brown and very long. It hangs so low that it almost sweeps the ground. Under the outer fur is a thick layer of wool. Eskimos (Inuit) use musk-ox fur to make a fine cloth.

Older musk-ox bulls have horns that can be 2 feet (60 centimeters) long. Cows and young musk-oxen have smaller horns. A musk-ox uses its horns as weapons if it feels threatened.

Bulls give off a strong smell during mating season. The animal was named for this smell, which is called musk.

► More to explore

Bison • Goat • Sheep

Muskrat

The muskrat is a rodent that looks like a small beaver. Muskrats build homes near lakes, ponds, rivers, and marshes. The scientific name of the muskrat is *Ondatra zibethicus*.

The muskrat is native to North America. In the early 1900s, however, people brought muskrats to northern Europe and Asia. Muskrats quickly made themselves at home in these regions.

The muskrat has brownish red fur that is thick and warm. Its body is about 13 inches (33 centimeters) long. The backs of its feet are partially webbed. The muskrat uses them like paddles when



Musk rats look like a cross between a rat and a beaver. They live in water, where they build homes of mud and plants that rise above the water's surface.

swimming. The animal got its name because it produces a strong odor that smells like musk.

Musk rats are most active during the evening and nighttime. They usually eat water plants.

Musk rats live in family groups. Their home may be a burrow, or hole, in a riverbank. They also may live in mounds of mud and plants in shallow water. A female muskrat can give birth to several litters during a year. A litter consists of 1 to 11 young. The babies are born blind, but after a month they can care for themselves. A muskrat usually lives for about three years in the wild.

The muskrat is hunted for its fur. In some areas people eat muskrats. The animal can become a pest when it digs into dams and other structures.

► More to explore

Beaver

Mustard

Mustard is a spice made from the seeds of certain plants. There are two main types of mustard plant. One is called white, or yellow, mustard. The other is called brown, or Indian, mustard.

A mustard plant has a soft green stem and produces bright yellow flowers. The plant reaches its full height of 5 to 6.5 feet (1.5 to 2 meters) as its flowers fade. Green pods then appear on its branches. These pods hold the seeds.

Mustard seeds are tiny and almost round. They can be light or dark yellow. The seeds have no odor when whole. But when they are ground up and mixed with water, a chemical reaction takes place. This produces mustard oil, which has a smell and taste.



Mustard plants produce bright yellow flowers.

Mustard is used to flavor foods such as meat and salad dressings. Most people buy mustard as a paste. The paste includes vinegar and other ingredients along with crushed mustard seeds. In some places people cook and eat the leaves of mustard plants.

Mustard also has been used in medicine. Doctors once used mustard to treat chest colds and other illnesses. They also gave a drink made of mustard seeds and warm water to people who had been poisoned. The drink forced the person to vomit out the poison.

► **More to explore**
Spice

Mutation

A mutation is a mistake or a change in a living thing's DNA. DNA, or deoxyribonucleic acid, is a chain of chemical units found in each cell of a living thing. DNA makes up the parts of a cell called genes. The chemical units of DNA are arranged in a particular sequence, or

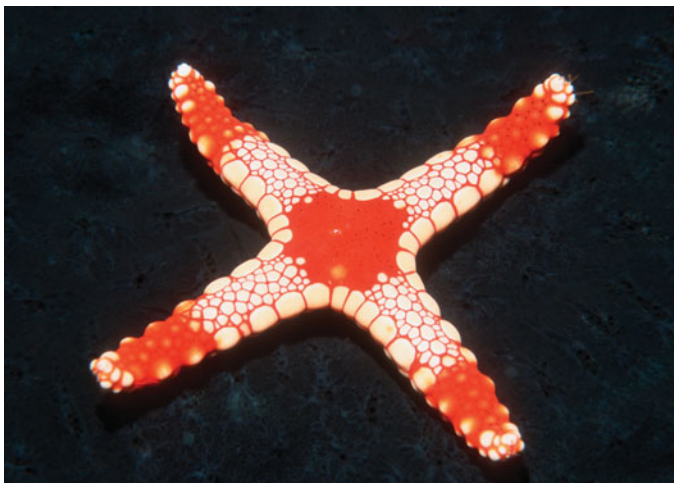
order in the genes. This sequence forms a kind of code, called a genetic code, that tells cells what to do. If the chain gets out of order, breaks, or changes in some other way, a mutation has occurred.

Some mutations may happen when the DNA is made. Other mutations are the result of damage to the DNA. This damage can be caused by too much exposure to harmful energy, such as X-rays, or to certain chemicals.

Most mutations are harmless. Often a stronger than normal gene can prevent a mutated gene from causing a problem. However, some mutations are very serious. Some can cause a cell to divide incorrectly. This can lead to a type of disease called cancer. Some mutations can be passed from a parent to its offspring, or young. This may cause the young to be born with a defect or a disease. For example, a particular mutation that comes from both parents causes a blood disease called sickle-cell anemia.

But sometimes a mutation leads to a helpful change. For example, a mutation could cause an animal to have a hair color that blended in with its surroundings. This animal would be more likely to survive, and it would pass the hair color down to its young. Scientists think that such mutations lead to the evolution, or formation, of different living things.

► **More to explore**
DNA • Evolution • Genetics



As a result of a mutation, a starfish grew only four legs instead of five.

Myanmar

Myanmar is a country in Southeast Asia. In 1989 the government changed the country's name from Burma to Myanmar. The capital was Yangon until 2005. In that year the government began moving some offices north to a site near the town of Pyinmana.

Geography

Myanmar shares borders with Bangladesh, India, China, Laos, and Thailand. The Indian Ocean lies to the west. The land is mostly mountainous.

Plants and Animals

Evergreen rain forests grow in the wettest regions. Teaks and other trees that lose their leaves grow in areas with less rainfall. Many birds, snakes, and monkeys live in the rain forests. Myanmar's tigers and elephants are endangered.

People

The Burman people make up most of the population. The Shan, Karen, and



Ruins of ancient Buddhist temples stand in Pagan (or Bagan), a city in central Myanmar.

other peoples form smaller groups. Burmese is the main language. Most of the people practice Buddhism. Almost three quarters of the population lives in rural areas.

Economy

Most of Myanmar's workers are farmers. The main crops are rice, sugarcane, beans, peanuts, corn, and cotton. Cattle, pigs, and buffalo are the main livestock. Myanmar has deposits of copper, lead, tin, jade, and gems. It also has reserves of oil and natural gas. Factories make clothing, cement, and fertilizers.

History

From the 800s to the 1200s the Burmans ruled a powerful Buddhist kingdom. In the mid-1700s a Burman king unified Myanmar's peoples. Great Britain took control in 1885. The British called the land Burma. Burma gained independence in 1948.

► More to explore

Asia • Yangon



Facts About MYANMAR



Population
(2008 estimate)
47,758,000

Area
261,228 sq mi
(676,577 sq km)

Capital
Yangon
(Rangoon)

Form of government
Military regime

Major cities
Yangon
(Rangoon), Mandalay, Moulmein (Mawlamyine), Bassein (Patheingyi), Pegu (Bago)



Mycenaean Civilization

► see Aegean Civilization.

Mythology

Mythology is the rich collection of traditional tales called myths from cultures all over the world. Many myths date back to ancient times. They are stories about how the world was created and why certain things happen. Today the word myth is often used to describe something that is not true. But a myth is not just a made-up story. Myths tell of gods, heroes, and events that a group believes, or at one time believed, to be real. A culture's myths are often closely tied to its religion.

Background

Thousands of years ago people did not have the sciences to help them understand life. For instance, they did not know why the sun rises each morning or why the seasons change. Ancient people saw sickness, death, and natural disasters, but they did not understand what caused them.

Groups of people developed their own stories and beliefs to explain the world around them. These myths were usually not written down. Instead one generation of people passed them along to the next generation by telling them out loud as stories.

Types of Myths

Each group of people has developed its own explanations about the world. But



Many different cultures have created myths to explain the world around them.

all myths try to answer basic questions such as, How was the world created? How did life on Earth begin? Why is there evil in the world?

Myths explain the origins of Earth in many different ways. Many cultures believe that an all-powerful god created the world. For example, a myth of the Polynesian people tells that the god Io formed the world out of water and darkness. Some Native American myths say that the world came up from underground and developed gradually, like a child being born.

To explain the origin of human beings, an ancient story from India described a being called the Self. When the Self became lonely, it divided into two parts, creating man and woman. Their children became the human race. Many myths from western Africa tell that the first beings were a pair of twins. The Sumerians, an ancient Middle Eastern people, believed that the first people came from clay. According to their myths, the water god told his mother to mold bits of clay into the shapes of people.

Many cultures also have myths explaining why there is evil in the world. For example, an ancient Greek myth tells that Pandora was the first woman on Earth. She opened a jar to see what was inside, and all kinds of miseries flew out. So, through her curiosity, troubles were released into the world. A great variety of other myths explain the origins of animals, plants, and events in nature.

Some Figures of Greek and Roman Mythology		
Greek Name	Roman Name	Description
<i>Main Gods and Goddesses</i>		
Aphrodite	Venus	goddess of love
Apollo	Apollo	god of light and music
Ares	Mars	god of war
Artemis	Diana	goddess of hunting
Athena	Minerva	goddess of wisdom
Hades	Pluto	god of the underworld
Hephaestus	Vulcan	god of fire
Hera	Juno	queen of the gods
Hermes	Mercury	messenger of the gods
Hestia	Vesta	goddess of the home
Poseidon	Neptune	god of the sea
Zeus	Jupiter	king of the gods
<i>Other Figures</i>		
Asclepius	Aesculapius	god of medicine
Demeter	Ceres	goddess of farming
Dionysus	Bacchus	god of wine
Erinyes	Furiae (Furies)	goddesses who punished wrongdoers
Eros	Cupid	god of love
Gorgons		female monsters with snakes for hair; included Medusa
Moirai	Parcae (Fates)	three goddesses who controlled humans' lives
Muses	Muses	goddesses of the arts and sciences
Nymphs		goddesses of nature
Titans		family of giants; included Cronus (god of farming) and Prometheus (god of fire)

Many other myths tell of the gods. Stories discuss their births, special powers,

Some Figures of Norse (Northern European) Mythology	
Name	Description
Balder	god of light and peace
Freyja	goddess of love, fertility, battle, and death
Freyr	god of fertility, rain, and sunshine
Frigg	goddess of marriage; wife of Odin
Hel	goddess of the dead
Loki	god of mischief
Odin	chief god
Thor	god of thunder
Tyr	god of war and justice
Ull	god of hunting
Valkyries	female messengers of Odin who took the souls of heroes to Valhalla (heaven for warriors)

and victories over monsters or enemies. Other myths tell about heroes with amazing strength or cleverness. For

instance, ancient Greek myths tell that the brave warrior Heracles completed 12 nearly impossible tasks. The Chinese hero Da Yu is said to have saved China by draining the land after a huge flood.

Collections of Myths

Some cultures developed collections of myths, especially in ancient times. Their stories describe a group of gods and the world that the gods live in.

The ancient Egyptians had many gods. Some looked like people and some looked like animals. For example, the doglike god Anubis was the god of the dead. For a time a ruler named Amen-hotep made the sun the only god. He called the god Aton, and he changed his own name to Akhenaton. After he died the other gods were worshipped again.

The ancient Greeks worshipped 12 main gods. They believed that their gods lived on Mount Olympus. Zeus was the king of the gods.

The ancient Romans borrowed much of the mythology of the Greeks. They gave many of the Greek gods new names. For example, Zeus became known as Jupiter.

Norse mythology developed long ago in northern Europe. Its main god was Odin. He and the other gods lived in Asgard. A palace called Valhalla was part of Asgard. After dying in battle, human warriors were taken to Valhalla by warrior women called Valkyries.

► **More to explore**
Religion • Storytelling

Some Figures of Egyptian Mythology	
Name	Description
Amon	one of the chief gods
Bastet	goddess of music and pregnant women; cat-headed
Hathor	goddess of women and love; cow-headed
Horus	god whose eyes were the sun and the Moon; appeared as a falcon
Isis	important goddess; wife of Osiris and mother of Horus
Khnum	god of fertility; ram-headed
Mont	god of war; falcon-headed
Nut	goddess of the sky
Osiris	important god of the underworld
Re	chief sun god
Seth	god of disorder; had some features of a dog
Thoth	god of the Moon, wisdom, and writing; ibis-headed

Britannica Student Encyclopedia

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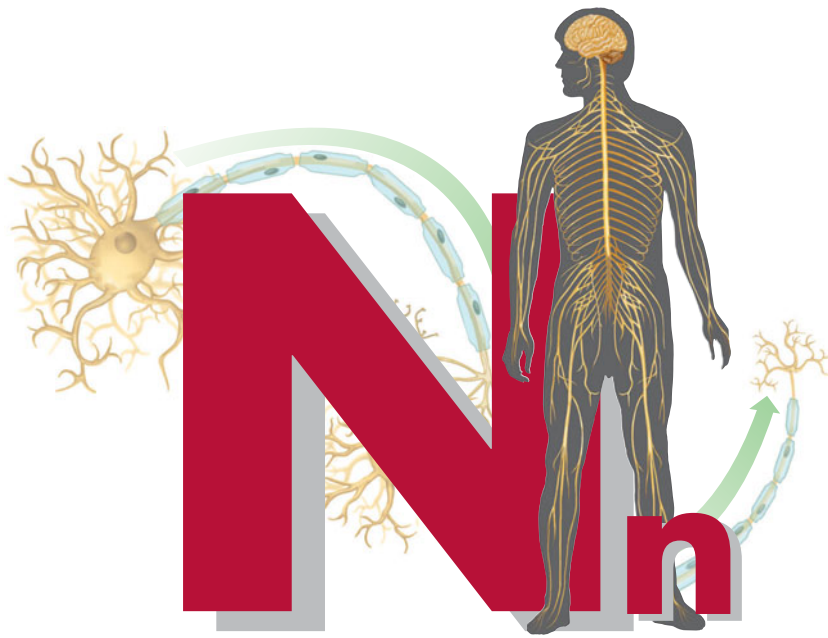
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Animals may use their claws to scratch, to clutch objects, to dig, to climb, or to fight other animals.

(See Nail and Claw.)

At one time there were as many as 240 different groups of native peoples living in North America.

(See Native Americans.)

The planet Neptune has the fastest winds ever discovered in the solar system.

(See Neptune.)

Nerve cells in the brain and spinal cord cannot regrow. This is why damage to the brain or spinal cord is permanent.

(See Nervous System.)

The Nobel prizes are named after Alfred Nobel, the inventor of dynamite.

(See Nobel Prize.)

NAACP

► see National Association for the Advancement of Colored People (NAACP).

Nail and Claw

On the human body, a nail is a tough plate that grows at the end of a finger or a toe. Most other primates, such as apes and monkeys, also have fingernails and toenails. Many other animals have similar structures called claws, or talons.

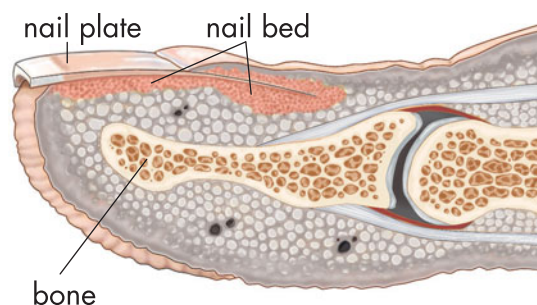
Nails and claws are made of a hard protein called keratin. So are hooves, hair, feathers, and horns.

Nails

The outside part of the nail, called the nail plate, is nearly see-through. The nail plate is made of dead cells. Lying below the nail plate is the nail bed. Blood vessels in the nail bed give it a pink color. The nail bed also contains many nerve endings.

The nail grows from the nail root, which is buried under the skin at the base of the nail. As the nail grows, new cells

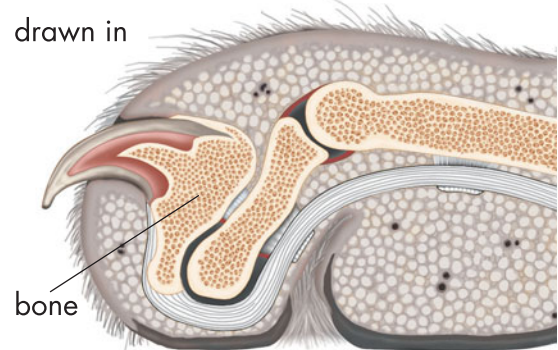
Human Nail



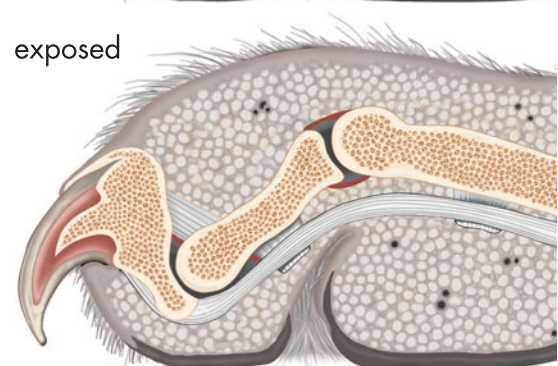
A human nail is not connected to bone.

Cat Claw

drawn in



exposed



A cat's claw is connected to the toe bone.

push the older cells up toward the end of the finger or toe. The tip of the nail looks white because it is no longer attached to the nail bed.

Nails protect the tips of the fingers and toes. People, apes, and monkeys also use their fingernails to scratch and to handle small objects.

Claws and Talons

Reptiles, many mammals, some amphibians, and birds have claws. Some bird claws are called talons. Claws and talons grow in a curved, downward direction from the ends of an animal's toes.

A claw's shape varies among animals. Eagles have long, sharp talons for grabbing prey. Cats have short claws that they can draw back into their footpads.

Like nails, claws protect the ends of an animal's toes. Animals also use their claws to scratch and to clutch objects. Some animals use their claws to dig, to climb, or to fight other animals.

► More to explore

Hoof

Nairobi



Population
(2006 estimate)
2,864,700

Nairobi is the capital of the country of Kenya. It is the main city of eastern Africa. It was named after a watering hole that was in the area before the city was built. The Masai people called the watering hole Enkare Nairobi, which means “cold water.”

Many of Kenya's businesses and industries are located in Nairobi. Factories in the city make food products, drinks, cigarettes, furniture, and other goods. Many people in Nairobi work for the railways. Goods are loaded on trains in the city and transported to Mombasa, Kenya's main seaport.

Tourism is also important to the economy of Nairobi. Many tourists visit Nairobi National Park, which lies just outside the city. It is a large and beauti-



Large, modern buildings stand near a park in Nairobi, Kenya.

ful nature park where wild animals are protected. The park is home to lions, giraffes, rhinoceroses, zebras, and many kinds of birds.

Nairobi has many important buildings, including law courts and a cathedral. The University of Nairobi and the National Museum of Kenya are also located in the city. In addition, Nairobi has a national theater.

In the late 1800s Great Britain began taking over much of eastern Africa. Nairobi was founded in the late 1890s. It began as a settlement along a railway built by the British. In 1905 the British made Nairobi their capital in eastern Africa. Nairobi soon grew into a large city. In 1963 Kenya became an independent country with Nairobi as its capital.

► More to explore

Kenya

Nakota

► see Sioux.



Namibia

Namibia sits on the southwestern coast of Africa. The country gained independence from South Africa in 1990. Windhoek is Namibia's capital and largest city.

Geography

Namibia shares borders with Angola, Zambia, Botswana, and South Africa. The Atlantic Ocean lies to the west.

The Namib Desert runs along the Atlantic coast. The Central Plateau covers the center of Namibia. It is a high area with hills and mountains. The Kalahari Desert is in the east.

Namibia's climate is generally dry and hot. Because there is little rain, the country has only a few rivers that flow year-round. Droughts are common.

Plants and Animals

The Namib and the Kalahari deserts have few plants. Shrubs and grasses



Footprints line the top of a sand dune in the Namib Desert, Namibia.

cover the Central Plateau. Trees are more common in the north.

Despite its dry landscape, Namibia is home to lions, giraffes, zebras, antelope, elephants, and rhinoceroses. The country protects many animals in Etosha National Park.

People

The Ovambo people and other African groups make up most of Namibia's population. A smaller group of Namibians have mixed African and European roots. White people form another small group. The whites have mainly Dutch or German roots.

English is the national language, but African languages are more commonly spoken. The majority of the population is Christian.





A woman in Namibia carries her son.

More than half of Namibians live in rural areas. The north is more crowded than the south. Very few people live in the Namib Desert.

Economy

Namibia's economy depends on mining. Namibia has some of the largest mineral deposits in Africa. The country is a leading producer of diamonds and uranium. Its other important minerals include zinc, copper, silver, and gold.

Many Namibians are herders, farmers, or fishers. Cattle and sheep are the main livestock. Herders in the south raise karakul sheep for their curly black coats. Farmers grow grains, fruits, vegetables, and beans. Processed fish and beef are important products.

Tourism is growing in Namibia. Visitors come to see the country's natural beauty and wildlife.

History

The earliest people in what is now Namibia were the San, or Bushmen. They followed a nomadic (wandering) way of life based on hunting and gathering. Over the centuries other African peoples settled in the area.

In the late 1400s Portuguese explorers visited the Namibian coast. The Dutch and the English later explored the area. By the 1880s Germans ruled the area, which they called South West Africa. German settlers took most of the good farmland from the Africans. In the early 1900s the local Herero people began a war against the Germans. The Germans responded by killing many Herero.

By 1915 South Africa had taken over South West Africa. The white leaders of South Africa brought their laws known as apartheid to the territory. These laws kept blacks and whites separate and treated blacks unfairly. In 1966 the countries of the United Nations voted to end South Africa's control of South West Africa. However, South Africa refused to give up its control.

Meanwhile, South West Africa became known as Namibia. A group called the South West Africa People's Organization (SWAPO) fought for Namibia's independence. In 1990 Namibia finally won independence. The leader of SWAPO became the nation's first president.

► More to explore

Kalahari • South Africa • Windhoek

Facts About NAMIBIA



Population
(2008 estimate)
2,089,000

Area
318,580 sq mi
(825,118 sq km)

Capital
Windhoek

Form of government
Republic

Major cities
Windhoek,
Walvis Bay, Swakopmund, Rehoboth, Rundu

Napoleon



An artist named Jacques-Louis David painted *Napoleon in His Study* in 1812. The painting is in the National Gallery of Art, in Washington, D.C.

Though short in height, Napoleon cast a long shadow across European history. He was emperor of France from 1804 to 1814. He was also one of the most successful military leaders of all time.

Early Life

Napoleon Bonaparte was born on August 15, 1769, on the island of Corsica in the Mediterranean Sea. France then ruled Corsica. Napoleon went to military schools in France. He became an army officer when he was only 16 years old.

Soldier

Napoleon was in Paris (the capital of France) in 1792, when the French

people overthrew their king. This was part of the French Revolution.

Other European rulers wanted to bring back the king. Napoleon helped to defend France's new government in a series of wars. He became a military hero.

Consul

In 1799 a new government called the Consulate took control of France. Napoleon became the leader, called first consul. He made many changes. Most importantly, he introduced a set of laws called the Napoleonic Code. He also continued to fight other European powers. He built up an empire in a series of wars called the Napoleonic Wars.

Emperor

In 1804 Napoleon made himself emperor of France. Other countries banded together against him. He won many victories, but in 1812 he invaded Russia. This was a disaster for the French army. Hundreds of thousands of soldiers died in the cold Russian winter.

Napoleon's enemies saw their chance. Great Britain, Austria, and Prussia joined Russia in a war that became known as the War of Liberation. They finally forced Napoleon from power in 1814.

Last Years

Napoleon was sent away to Elba, a small island off the coast of Italy. In 1815 he escaped to France. He gathered

supporters and seized power once again. This period was known as the Hundred Days. It lasted until British and Prussian troops defeated Napoleon in the battle of Waterloo, in Belgium, in June 1815.

This time Napoleon was sent away to Saint Helena, an island in the South Atlantic Ocean. The British watched him carefully so he could not escape. Napoleon died on Saint Helena on May 5, 1821.

► More to explore

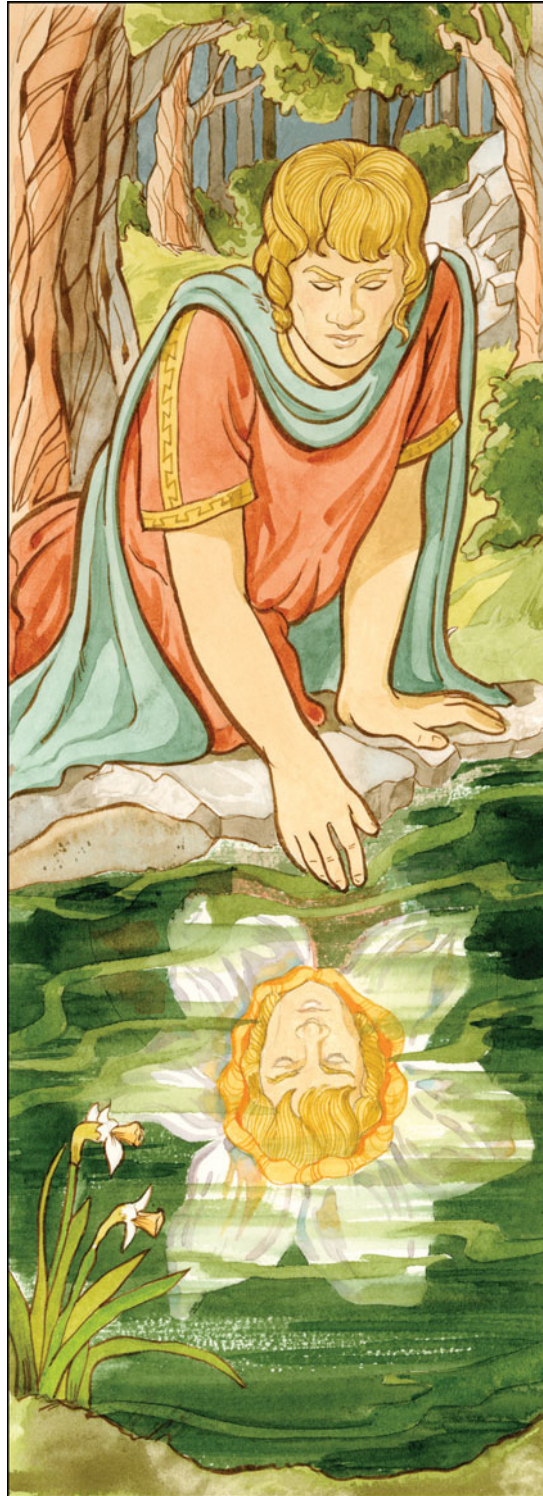
French Revolution

Narcissus

In ancient Greek mythology Narcissus was a handsome young man. He loved himself more than he did others. This flaw led to his death.

Narcissus' father was the river god Cephissus. His mother was Leiriope, a minor female goddess called a nymph.

According to legend, Narcissus was so handsome that many girls fell in love with him. He refused them all, however. The gods wanted to punish Narcissus for being so selfish. They made him fall in love with his own image. Narcissus saw his reflection in a pool of water when he leaned over to take a drink. He became so enchanted with his image that he could never look away. Eventually he died there. The gods then took pity on Narcissus and changed him into



In Greek mythology Narcissus was a man who fell in love with his own image.

a flower. Today a person who is very selfish is sometimes called a narcissist.

► More to explore

Mythology

Narraganset



A Narraganset man from Rhode Island wears traditional dress.

The Narraganset were a powerful Native American people whose homeland included much of what is now Rhode Island. The tribe was nearly destroyed by warfare with the English.

Narraganset families lived in dome-shaped homes called wigwams. The Narraganset grew corn, beans, squash, and sunflowers. They also fished and hunted deer and moose.

In the early 1600s English settlers began to arrive in Narraganset territory. At first the Narraganset were friendly toward the English. They helped the English fight a war against the Pequot tribe in 1637. In 1675, however, the Narraganset tried to stay out of another dispute called King Philip's War. The Narraganset were drawn into the war after they refused to turn over Wampanoag Indians who had fled into their territory. The English

army attacked and burned a large Narraganset village near what is now Kingston, Rhode Island. In the battle nearly 1,000 Narraganset were killed or captured and enslaved.

Surviving Narraganset fled. Most joined other tribes, such as the Mohican, the Abnaki, and the Niantic. Those who merged with the Niantic kept the name Narraganset. At the end of the 20th century there were more than 2,000 Narraganset living in the United States.

► More to explore

King Philip's War • Native Americans
• Pequot

Nashville



Population
(2000 census),
city, 545,524;
(2007 estimate)
590,807

Nashville is the capital of the U.S. state of Tennessee. The city lies on the Cum-



The Country Music Hall of Fame and Museum is one of Nashville's leading attractions.

berland River. It is world famous for its country music. A country music radio show called the Grand Ole Opry has been broadcast from the city for more than 75 years. The Country Music Hall of Fame and Museum is also in Nashville.

The music, entertainment, and tourist industries are important to Nashville's economy. In addition, several large insurance, money management, and health care companies have headquarters in the city. Many people work for colleges and universities in Nashville. The city's leading industries also include car manufacturing and printing and publishing.

Nashville has many interesting buildings. The state Capitol was built in 1855. It is the city's central landmark. A copy of the Parthenon, an ancient temple in Athens, Greece, is also located in Nashville. In fact, the city has a number of buildings that look like those in ancient Greece.

Several Native American tribes once lived in the Nashville area. White settlers founded a fort at the site in 1779. The settlement that grew around the fort was named Nashville in 1784. It became the official state capital in 1843.

In 1862, during the American Civil War, Union troops captured Nashville. The last major battle of the Civil War was fought outside the city in 1864.

► **More to explore**
Country Music

Nassau



Population
(2002 estimate)
179,300

Nassau is the capital of The Bahamas, an island country in the Atlantic Ocean. The city lies on the coast of New Providence Island. It is the largest city in The Bahamas. Nassau's warm climate and beautiful beaches have made it one of the world's major vacation spots.

Nassau's economy is based mostly on tourism. The city is also a banking center and port. Citrus fruits, fish, rum, and other goods are shipped out through the port for sale overseas.



Vacationers can enjoy sun, sand, and sailboating at a beach near Nassau, The Bahamas.

The British took over The Bahamas in the 1600s. They founded Nassau in the late 1600s. Nassau was a base for pirates in the 1700s. The pirates attacked European ships in the nearby Caribbean Sea. During World War II (1939–45) the United States set up a military base in Nassau. In 1973 The Bahamas became an independent country with Nassau as its capital.

► More to explore

Bahamas, The

Natchez

The Natchez were a Native American people who lived along the Mississippi River. They built their villages near what is now the city of Natchez, Mississippi. Wars with the French destroyed the Natchez as a separate tribe in the 1700s.

The Natchez grew corn, beans, and squash. They also hunted, fished, and gathered wild plants. They lived in tall houses that they made from mud and straw. They built large temples on top of mounds made of earth.



The houses of the Natchez had thatched (straw) roofs.

French traders and settlers arrived in Natchez territory in the early 1700s. The French and the Natchez soon began fighting. By 1730 the French and their Choctaw allies had driven the Natchez from their villages. About 400 Natchez were captured and sold as slaves. Other Natchez joined nearby tribes, such as the Chickasaw, the Creek, and the Cherokee.

In 1832 the surviving Natchez, along with their new tribes, were forced to move to Indian Territory (now Oklahoma). At the end of the 20th century there were only a few Natchez descendants left. The former Grand Village of the Natchez is now a historic site in Mississippi.

► More to explore

Native Americans

National Anthem

People sing patriotic songs to show love for their country. Many countries choose one patriotic song to be their national song, or anthem, which people play or sing at important events. Some national anthems are religious. Others are about important battles. Some simply express pride in the nation.

United States

The national anthem of the United States is “The Star-Spangled Banner.” Francis Scott Key wrote the words during the War of 1812. Congress chose the song as the national anthem in 1931. People sing it at parades, ceremonies, and even before sports events. Though

there are four verses to the song, most people sing only the first one. While singing, people stand and remove their hats as a sign of respect for the country. Some people place their right hand over their heart.

Other Countries

One of the oldest national anthems is the United Kingdom's "God Save the Queen." (If a man is on the throne, the anthem is called "God Save the King.") In some former British colonies people sing different words to the anthem's tune. For example, in the United States people sing "My Country 'Tis of Thee" to the tune. Australia replaced "God Save the Queen" with its own anthem, "Advance Australia Fair," in 1984.

France's national anthem is "La Marseillaise" (Song of Marseille). Like the U.S. national anthem, it was written during a war—in this case, the French Revolution. Canada's anthem, "O Canada," may be sung in either English or French—the two languages of that country. A famous poet named Rabindranath Tagore wrote India's anthem, "Jana-gana-mana" (Thou Art the Ruler of All Minds).

Changes in politics can cause a national anthem to change. For example, the Nazis of Germany used "Deutschland, Deutschland über Alles" (Germany, Germany Above All) as their anthem. After World War II Germany stopped using the song because of its link to Nazism. However, West Germany later used one verse of the song as its anthem. Today Germany uses the same anthem but



Members of Brazil's women's soccer team singing their country's national anthem after winning gold medals in competition.

with a new title, "Deutschlandlied" (Song of Germany).

► More to explore

Australia • Canada • France • French Revolution • Germany • India • Key, Francis Scott • Nazi Party • United Kingdom • United States • War of 1812

National Association for the Advancement of Colored People (NAACP)

The National Association for the Advancement of Colored People (NAACP) is the oldest civil rights organization in the United States. It was created in 1909 to work for equal rights for African Americans and other minority groups. The NAACP has fought discrimination in schools, the workplace, and public places. Its goal is to end



The NAACP is one of the sponsors of a project that checks elections to make sure that all votes are fairly counted.

racism—the belief that one group of people is better than other groups.

Members of the NAACP try to make sure that everyone is treated equally under the law. They ask the U.S. Congress to pass new laws to guarantee that equal treatment. In this way they act to ensure the civil rights of all citizens. Civil rights are those that are granted by the laws of the country. These include the right to vote and to own property.

The NAACP's most famous success is the U.S. Supreme Court decision in the case of *Brown vs. Board of Education of Topeka*. In 1954 lawyers for the NAACP argued that segregation in public schools should end. The justices of the Court agreed and ruled that segregation was illegal. As a result black children could attend the same schools as white children.

The NAACP played an important role during the civil rights movement of the

1960s. Its members helped to organize the March on Washington, a large demonstration for civil rights, in 1963. The NAACP also asked Congress to pass the Civil Rights Act (1964) and the Voting Rights Act (1965).

► More to explore

African Americans • Civil Rights Movement

National Park

A national park is an area set aside by a country's government. Sometimes the government already owns the land. In other cases the government tries to purchase lands it wishes to make into a park. Many national parks are created to preserve the natural environment. Most of the landscapes, plants, and animals in a national park are kept in their natural state. Some national parks do not allow visitors. In others, visitors must follow rules to keep the plants and animals from being hurt by human activity. Some parks protect areas where important events in history occurred.



Macaque monkeys gather in a national park in Japan.



The United States has many national parks. Most are in the West.

In 1872 the U.S. government set up the world's first national park. It was Yellowstone National Park in the state of Wyoming. Since that time, the United States has created many more national parks. They include Acadia National Park in Maine, Grand Canyon National Park in Arizona, Grand Teton National Park in Wyoming, and Yosemite National Park in California.

The U.S. government created the National Park Service in 1916 to oversee the park areas. The service builds roads and campgrounds.

Canada named its first three national parks—Banff, Glacier, and Yoho—in the 1880s. All are in western Canada.

Most of Europe's national parks date from the 1900s. The United Kingdom named its first national parks in 1951.

Africa's national parks have many animals. Serengeti National Park in Tanzania has antelopes, zebras, and lions. Tsavo National Park in Kenya has elephants and rhinoceroses.

National parks in many places are built around natural wonders. For example, Japan's Fuji-Hakone-Izu includes Mount Fuji, a famous volcano. Venezuela's Canaima National Park includes Angel Falls, the world's highest waterfall.

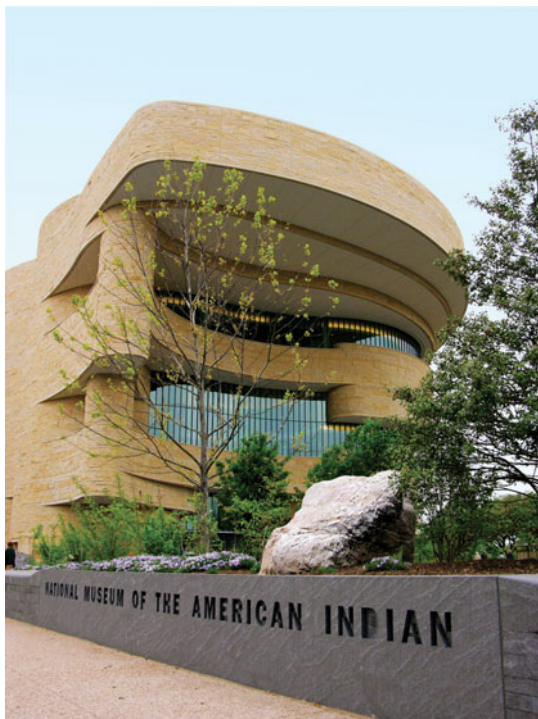
► More to explore

Fuji, Mount • Grand Canyon

Native Americans, or American Indians

The first peoples in the Americas lived there for thousands of years before European explorers arrived. Descendants of many of these peoples still live in North and South America today.

Arctic peoples, including the Eskimo (Inuit) and the Aleut, lived in the far northern parts of North America. The Carib, the Aztec, the Maya, the Inca, and other groups lived in the Caribbean, Mesoamerica (Mexico and Central America), and South America.



The National Museum of the American Indian opened in 2004 in the U.S. capital of Washington, D.C. The museum teaches visitors about the culture and history of Native Americans.

Many other peoples lived in what are now Canada and the United States. These peoples are known as Native Americans or American Indians. In Canada they are also known as the First Nations.

Early Peoples of the Americas

The first peoples in the Americas probably traveled from Asia to what is now Alaska. Scientists believe that this happened about 60,000 to 20,000 years ago. During this period there may have been solid land where the Bering Strait now divides Asia and North America. By about 10,000 BC these peoples had spread throughout North, Central, and South America.

North American Peoples

The peoples of North America spread out into as many as 240 groups. These groups are sometimes called tribes or nations. The groups spoke different languages, but neighboring groups often had similar ways of life.

Native Americans in eastern North America included the Iroquois in the northeast and the Creek in the southeast. People in these regions used tree bark and branches to make houses, weapons, tools, and canoes. They made clothing from the skins of deer and other animals. They hunted, fished, and gathered wild plants. They also planted corn, squash, beans, and tobacco.

Peoples on the Great Plains of central North America included the Cheyenne and the Sioux. The grasses of the plains fed huge herds of grazing animals,



Before Europeans arrived, different Native American groups lived in many regions of North America.

including elk, deer, antelope, and bison (buffalo). Plains Indians got almost everything they needed from the bison. They ate the meat, made tepees and clothing from the skins, and made tools from the bones.

The Pueblo Indians, the Navajo, and other groups lived in the dry Southwest. Peoples there learned to farm using very little water. Some built homes from stone and adobe (sun-baked clay). Others lived in simpler shelters.



Native Americans of each area are often known for particular types of crafts. The Iroquois wove baskets out of grass (top left). Pueblo Indians made pottery with attractive designs (top right). The Cheyenne made beaded, animal-shaped figures (bottom left) for their children. The Tlingit carved totem poles (bottom right) that showed figures from their myths and legends.

Many groups of Californian Indians lived along the West Coast. They fished and hunted, and some groups made

flour from acorns. The Chumash built dome-shaped houses. The Miwok built houses that were partly underground.

The Great Basin was home to the Shoshone and other peoples. This dry area included what are now Nevada and Utah. These peoples moved around in search of food. They hunted small animals, fished, and gathered berries, nuts, seeds, and roots.

North of this region lived the Nez Percé, the Flathead, and other groups of Plateau Indians. These peoples fished and hunted. They often lived in villages during winter. During summer they camped in tents or tepees.

Many peoples lived on the Northwest Coast, an area that stretched between modern California and Alaska. They included the Tlingit and the Kwakiutl. The peoples of this region fished in the ocean and rivers. Some groups hunted whales. They made large houses and sturdy canoes out of wood.

The Chipewyan, the Cree, and other peoples lived in the subarctic. This area lies south of the Arctic, in what are now



Two dolls (left) show the style of clothes once worn by the Apache. A Cherokee boy (center) performs a dance in festive clothing. Nez Percé (right) display blankets with traditional designs.

Canada and Alaska. Subarctic peoples depended on caribou, moose, and beavers for food. They also made tents and clothing from animal hides.

Native Americans and Europeans

Europeans began to arrive in the Americas in the late 1400s. They called the people they met there Indians because they thought they had arrived in the East Indies, in Asia.

The Europeans brought new plants and animals. The horse brought great change to Native American life. Groups on horseback could travel long distances and hunt bison much more easily than before. Native Americans also welcomed such European goods as cloth fabrics, metal tools, and guns.

But the Europeans also brought diseases, including measles and smallpox. Most Native Americans could not fight these diseases because their ancestors had not been exposed to them. Smallpox soon wiped out many groups.

In the 1600s many people from England settled permanently in eastern North America. Some Native Americans helped the English at first. But as more English colonists arrived, they took over more of the Native Americans' land. Unlike the Native Americans, the colonists thought that individual people could own land.

Several wars broke out between colonists and Native Americans. In King Philip's War (1675–76) the English defeated a group of several tribes. This victory

allowed colonists to settle more land in New England.

Native Americans and the United States

Colonists had taken over much of the land in the Northeast by the end of the American Revolution in 1783. In the 1830s the U.S. government forced the Cherokee and other tribes in the Southeast to move west. Their difficult journey is now known as the Trail of Tears. The government set aside land called Indian Territory (now Oklahoma) for the tribes to live on. However, white settlers soon settled there, too.

In the mid-1800s the U.S. army fought many battles against the peoples of the Great Plains and the Southwest. One of the last conflicts took place in 1890 at Wounded Knee in South Dakota.

Eventually, most of the Native Americans of the West came to live on reservations. These were areas of land that the U.S. government set aside for certain Native American groups. However, a group's reservation often was smaller or in a different place than that group's homeland. Conditions on the reservations were poor. Many Native Americans had to give up their traditional ways of life.

In 1934 the U.S. government began to change the way it treated Native Americans. It passed a law that gave Native American governments more power over their own land and people.

Did You Know?

All Native Americans in the United States did not become citizens until 1924. Many did not get the right to vote until 1948.



In 1964 a group of Native Americans claimed that Alcatraz Island, part of the U.S. state of California, was rightfully theirs. Native Americans took over the island again during 1969–71.

However, many Native Americans were still angry at the U.S. government's treatment of them. A protest group called the American Indian Movement (AIM) formed in the late 1960s. AIM took over Alcatraz Island in San Francisco Bay during 1969–71. In 1973 AIM took over the town of Wounded Knee in South Dakota for more than two months.

Native Americans Today

By 2000 there were nearly 2.5 million Native Americans in the United States. (This number includes the Eskimo and other Arctic peoples.) They made up about 1 percent of the U.S. population. Less than half of them lived on or near reservations. Another 1.7 million people in the United States had some Native American ancestors.

Reservations are outside the reach of many state laws. This has allowed Native American groups to open gambling casinos on their land. These businesses raise money for the groups and provide jobs. Even so, Native Americans who live on reservations generally are poorer than most other Americans.

Native Americans continue to fight for the respect of their history and culture. Some have protested the use of Native American names or mascots by sports teams. Many have demanded that the U.S. government return or pay for the lands where their ancestors lived.

► More to explore

Eskimo • King Philip's War • North America • Trail of Tears • Wounded Knee

Natural Gas

► see Gas, Natural.

Natural Resource

A natural resource is something that is found in nature and can be used by people. Earth's natural resources include light, air, water, plants, animals, soil, stone, minerals, and fossil fuels. People need some natural resources to stay alive. They use others to make their lives better.

Every place on Earth has its own unique group of natural resources. Some countries have lots of oil or coal. Others have rich soil and thick forests but few miner-

als. The wealthiest countries are usually the ones with the greatest amount or variety of natural resources. They are wealthy because they can sell their resources to other countries that need them.

Renewable Resources

Many of the natural resources people need to survive are renewable. Renewable resources—such as sunlight, water, and air—cannot be used up. However, pollution can make them harder to use.

Plants and animals are also renewable resources. Normally living things replace themselves through reproduction. But some human activities can cause whole groups of living things to disappear forever. Examples of such activities include hunting, logging, building, and polluting.



Freshwater is a renewable resource that is much in demand.



People dig mines to get valuable mineral resources that are found underground. But mines can leave scars on Earth's surface.

Nonrenewable Resources

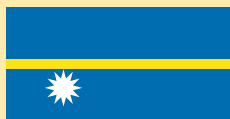
Nonliving things make up another kind of natural resource. These resources, such as soil, stone, oil, and gases, can take thousands or millions of years to form. They are considered nonrenewable because people use them faster than they can form.

Disappearing Resources

Many people fear that humans are destroying the world's natural resources. Clearing land for farming and building wipes out forests and the animals that live there. Cars and factories use huge amounts of oil every day. They also release poisonous chemicals that pollute the air, water, and soil. Many people are working to conserve, or protect, natural resources. In addition, scientists are working on ways to produce energy and goods without causing pollution or using up valuable natural resources.

► More to explore

Conservation • Forest • Fossil Fuel
• Mineral



Nauru

The country of Nauru occupies a small island in the Pacific Ocean. The capital is an area called Yaren district.

Geography

Nauru is located just south of the equator in the region called Oceania. The climate is hot and humid.

In the center of the island cliffs surround a plateau, or area of high land. The plateau once contained much phosphate, a mineral that is used to make fertilizers. The mining of phosphate has left the plateau bare.

Plants and Animals

Coconut palms and other tropical trees grow near Nauru's coast. Many birds visit the island. There were no mammals in the country until ships brought rats, mice, cats, dogs, and pigs.

People

Most of the people are native Nauruans. About one quarter of the people are



The island of Nauru is the world's smallest republic.

from other Pacific islands. Most Nauruans are Christians. Nauruan is the national language. Many people speak English as well.

Economy

The mining of phosphate made Nauru rich. However, the deposits ran out in the early 21st century. The government worked to develop banking, fishing, and other industries to replace mining. Nauru must buy most of its food and other supplies from other countries.

History

It is not known when the first people came to Nauru. In 1798 a British navigator arrived. He named the island Pleasant. In 1888 Germany took control. A British company began mining Nauru's phosphate deposits in 1907. In 1914 Australia took over the island. In 1942, during World War II, Japanese forces invaded Nauru. Australian troops took back Nauru in 1945. Nauru gained independence in 1967.

► **More to explore**
Oceania

Facts About NAURU



Population
(2008 estimate)
10,200

Area
8.2 sq mi (21.2 sq km)

Capital
Government offices are located in Yaren district.

Form of government
Republic



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Navajo

The Navajo are a Native American people of the southwestern United States. After the Cherokee, they are the country's second largest Native American tribe. The Navajo are also known as the Diné.

The Navajo originally lived in what is now western and central Canada. There they hunted animals and gathered plants to eat. Between AD 900 and 1200 the Navajo migrated southward. Then they began to farm. They lived in houses called hogans. Hogans were six- or eight-sided homes made from wood covered with earth.

The Navajo learned many skills from their neighbors. They probably learned farming from the Pueblo Indians. The Navajo also learned weaving from the Pueblo. Navajo rugs and blankets are well known. The Navajo learned to work with silver from their Mexican neighbors.

Spanish explorers arrived in Navajo lands in the late 1500s. They brought horses, sheep, and cattle. Many Navajo then became animal herders. For many years the Navajo raided Spanish and, later, American settlements. To end the raids the U.S. government went to war against the Navajo in 1863. U.S. troops destroyed Navajo herds and fields. In 1864 the government captured and held about 8,000 Navajo in eastern New Mexico.



A Navajo man creates a sand painting. The Navajo often produce such paintings during healing ceremonies.

In 1868 the Navajo were allowed to return to their homeland. They settled on a reservation along the border of Arizona and New Mexico. Today the Navajo have the largest reservation in the United States. It covers parts of Arizona, New Mexico, and Utah. In 2000 there were almost 270,000 Navajo.

► More to explore

Native Americans • Pueblo Indians

Navigation

Finding the way from place to place is called navigation. Navigators are people who do the work of finding the way. They need to know where they are. They also need to know which way to go.

Ship Navigation

For hundreds of years, navigators of ships have used several methods. One simple method is called piloting. Navigators who use this method look at objects on shore to find their way. Special markers help navigators steer clear of



Officers on a passenger ship use charts for navigation.

dangerous rocks and toward safe passages. These markers include lighthouses and buoys.

When traveling far from land, ship navigators may use the dead reckoning method. Navigators who use this method record how far the ship has traveled in each direction. To do this, they must keep track of the speed of the ship and how long the trip has taken. Compasses and charts help navigators with dead reckoning and piloting. Compasses are devices that help show the navigator



A magnetic compass has a needle that points north. It can be used for land, sea, or air navigation.

which direction the ship is traveling in. Charts are special maps with information that is helpful to navigators. This can include how deep the water is and where there might be rocks or other dangers under the water.

Ship navigators also may use the positions of the sun, Moon, planets, and stars to find their way. This is called celestial navigation. Navigators use special instruments to get exact measurements of the sky. They also use charts of the night sky.

In the 1900s ship navigators began to use radar, radio, and electronic devices to find their way. Radar systems measure distances by bouncing energy off nearby objects. Instruments on ships measure distances using radio signals from shore.

Today many ship navigators use a global positioning system (GPS). These systems use artificial satellites that orbit, or travel around, Earth. Navigators have special devices that send and receive radio signals from the satellites. The signals can tell navigators exactly where on Earth they are located.

Underwater Navigation

Submarine navigators cannot see stars or objects on shore when they are below the surface. They cannot use ordinary radio waves, either. Instead, submarine navigators find their way using energy waves called very-low-frequency radiation. Submarine navigators also have instruments that tell them how far below the surface they are. They use charts of the ocean floor as well.



A sextant is an instrument that is used in celestial navigation. A navigator uses it to find out how high in the sky the sun is. At night it can measure the height of the Moon or a star.

Air Navigation

Airplane navigators can use many of the same methods as ship navigators: piloting, dead reckoning, celestial navigation, radio, radar, and global positioning. The airplane navigator also must keep track of altitude, or how high the airplane is flying. Special instruments and computers on board help navigators do their job. Outside of the aircraft people called air traffic controllers use radio and radar to direct airplanes in and out of busy airports.

Space Navigation

Like ship and airplane navigators, navigators of spaceships use celestial navigation. Because they can see Earth, they can use it as well as the other planets and stars. Computers and radios on the spacecraft and on Earth also help space travelers to navigate.

► More to explore

Airplane • Compass • Lighthouse
• Radar • Ship • Submarine

Navy

A navy is the branch of a country's armed forces that fights on, under, or over the sea. A navy has several main jobs. It protects its country and its allies, or friends, as they carry on ocean trade. It also carries out attacks and other missions at sea during war.

Navies Today

Most navies keep a fleet, or group, of ships that are specially built for certain types of work. Aircraft carriers are ships that carry aircraft. Aircraft can land and take off from their decks. Cruisers and destroyers are ships that fight with guns or rocket-propelled missiles. Submarines and destroyers fight with underwater weapons, such as mines and torpedoes.

More than 100 countries have a navy. The United States has the world's largest and most powerful navy. During war-time, the U.S. Navy also includes the U.S. Coast Guard.



Airplanes are parked between missions on the flight deck of a nuclear-powered aircraft carrier.

Did You Know?

Some countries with no seacoast still have a navy. Examples include Bolivia and Paraguay.

History

A number of ancient civilizations, including ancient Greece and Rome, had navies. Most ancient warships were large wooden vessels powered by oars. During naval warfare, troops tried to sink an enemy's ship by ramming it, setting it on fire, or sending armed forces aboard.

During the 1500s and 1600s warships changed greatly. Sails became the main source of power. They allowed ships to travel farther and faster. Cannons also were mounted on board.

The next important development in warships came in the middle of the 1800s. Countries began to build warships from iron and steel instead of wood. Steam engines replaced sails. In the late 1800s countries built armored, fast-moving battleships with huge, powerful guns.

The battleship was the mightiest naval ship until World War II (1939–45). During this war the Japanese successfully used aircraft carriers. Bomber planes launched from aircraft carriers sank ships, including battleships, far out at sea. Since then air power, including airplanes and missiles, has been the main weapon of the world's navies.

► More to explore

Ship • Submarine • War

Nazi Party

The Nazi Party was a political group that ruled Germany between 1933 and

1945. "Nazi" is a short form of the official name. In English the official name is the National Socialist German Workers' Party. Under Adolf Hitler's leadership, the Nazis started World War II. They also carried out the Holocaust—the murder of about 6 million Jewish people.

Teachings

The Nazis believed that the people should obey a strong leader. They had no use for democracy, rule of law, human rights, or peace. The Nazis also taught that Germans were born to rule over what they called "inferior races" (lesser peoples). Hitler preached a special hatred against Jews.

Rise of Nazism

Nazism developed after World War I (1914–18). Germany lost that war. This led to hard times for the country. Many Germans blamed the government for their problems. Germans began looking for a change.



Members of Adolf Hitler's private army, the Storm Troopers, march through the streets of Nuremberg, Germany, after a Nazi Party rally.

The group that became the Nazi Party formed in 1919. Hitler soon took control. He attracted many new members with his angry speeches. In 1923 Hitler tried to take over the government but failed.

Nevertheless, the Nazi Party continued to grow. Many people joined the Nazis during the Great Depression—a time of poverty that began in 1929. Germans began to vote for Nazi candidates in elections. In 1933 the president of Germany named Hitler chancellor (prime minister).

Hitler made himself a dictator, or leader with unlimited power. His secret police rounded up his enemies and put them in concentration camps (prison centers).

World War II

Hitler also built up Germany's armed forces. They took over Austria and part of Czechoslovakia. In 1939 Germany invaded Poland. This act set off World War II.

During the war the Nazis carried out the Holocaust. They used poison gas to kill millions of Jews and others.

Hitler's hopes for the Nazi Party ended with Germany's defeat in the war. Hitler killed himself on April 30, 1945. A few days later Germany surrendered.

After World War II

Nazism survived as a small movement in Germany and some other countries. In the 1990s some German youths formed gangs that believed in Nazi ideas. They

were called neo-Nazis (new Nazis). However, the number of neo-Nazis remained small.

► More to explore

Germany • Hitler, Adolf • Holocaust
• World War II

N'Djamena



Population
(2005
estimate), urban
area, 888,000

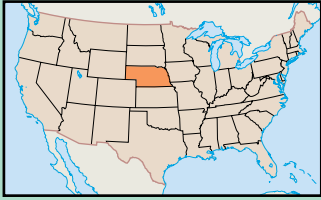
N'Djamena is the capital of Chad, a country in central Africa. The city lies on the Chari River. It is the largest city in Chad.

Many people in N'Djamena work in trade. Farmers from the surrounding area sell their cotton and cattle in the city.

N'Djamena began as a French military post named Fort-Lamy. The French set up Fort-Lamy in 1900 at the site of a small fishing village. They made Fort-Lamy part of a French colony in 1910. Chad became an independent country in 1960. Then the city grew as the country's capital. In 1973 the city was renamed N'Djamena.

► More to explore

Chad



Nebraska

The U.S. state of Nebraska probably got its name from a Native American word meaning “flat water.” This refers to the Platte River, which runs across the middle of the state. Corn is the state’s main crop. Indeed Nebraska’s nickname is the Cornhusker State. The capital of Nebraska is Lincoln.

Geography

Nebraska is located in the central United States in an area known as the Great Plains. The state is bordered on the north by South Dakota, on the west by Colorado and Wyoming, and on the south by Kansas. On the east the Missouri River separates Nebraska from Iowa and Missouri.

The land consists mainly of a rolling plain that rises gradually from east to west. The hills and plains of eastern and southern Nebraska are land that is good for growing crops. The vast Sand Hills country of the north-central and northwestern parts of the state is a treeless, grass-covered region suitable for

grazing cattle and sheep. The climate is dry, with cold winters and hot summers.

People

About 90 percent of Nebraska’s current population is white. The first large groups of Europeans to settle in the region were Germans. Later came Czechs, Swedes, Danes, and Russians.

Nebraska’s largest minority groups are African Americans and Hispanics. Each group makes up about 4 percent of the population.

Economy

Nebraska ranks among the top states in agricultural production. Corn is the most valuable crop. It is raised in the central and southern counties. Soybeans are another important crop. The state is a national leader in the sale of cattle and calves. Hogs are also valuable.

Nebraska’s economy also depends on services provided by various businesses. Business services such as telemarketing grew quickly in the state during the 1990s. Nebraska is also a major center of the U.S. insurance industry.

History

Several Native American tribes were living in the area when Spanish and French explorers visited between the 1500s and 1800s. These tribes included





Cranes gather on the Platte River in Nebraska during their migration north each spring.

the Pawnee, Oto, Missouri, Omaha, and several others.

Nebraska was acquired by the United States as part of an 1803 land deal with France known as the Louisiana Purchase. The first organized exploration of the Nebraska area was by the Lewis and Clark Expedition in 1804. Fur traders began creating trading posts in the area in about 1810.

In the early 1800s Nebraska was part of a large area reserved for Native Americans between the Missouri River and the Rocky Mountains. In 1854 the Kansas-Nebraska Act created territories for both Nebraska and Kansas. The Nebraska Territory was much larger than the present-day state. Between 1861 and 1863 it was reduced to about its present size. In 1867 Nebraska entered the

Union as the 37th state. The completion of the Union Pacific Railroad in 1869 increased settlement in the new state.

A terrible drought during much of the 1930s caused many farmers in Nebraska to give up their land. It also led to an increase in irrigation (watering) projects and improved farming practices. World War II turned the economy around in the early 1940s. Nebraska enjoyed economic growth for several decades.

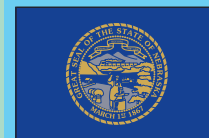
In the mid-1980s the state was hit hard by a decline in the value of farmland. Many farmers were forced to sell their farms to pay off their bills. In the early 21st century Nebraska was seeking to attract new industries to the state.

► More to explore

Kansas-Nebraska Act • Lincoln

Facts About NEBRASKA

Flag



Population

(2000 census)
1,711,263—
rank, 38th state;
(2008 estimate)
1,783,432—
rank, 38th state

Capital

Lincoln

Area

77,354 sq mi
(200,345 sq
km)—rank, 16th
state

Statehood

March 1, 1867

Motto

Equality Before
the Law

State bird

Western
meadowlark



State flower

Goldenrod



Nebula



The Lagoon Nebula can be seen in the constellation Sagittarius.

A nebula is a cloud of gas and dust in space. Nebulas appear in many shapes and colors. Sometimes a nebula blocks out the light of stars beyond it. When this happens, the nebula may look like a dark cloud. Other times a nebula glows a bright color, such as blue or red. This happens when the nebula reflects light from nearby stars or when nearby stars heat the nebula so that it glows.

Nehru, Jawaharlal

In 1947 Jawaharlal Nehru became the first prime minister, or leader, of India. For more than 20 years he had worked with Mahatma Gandhi to free India from British rule.

Nehru was born on November 14, 1889, in Allahabad, India. He studied in Great Britain and became a lawyer.

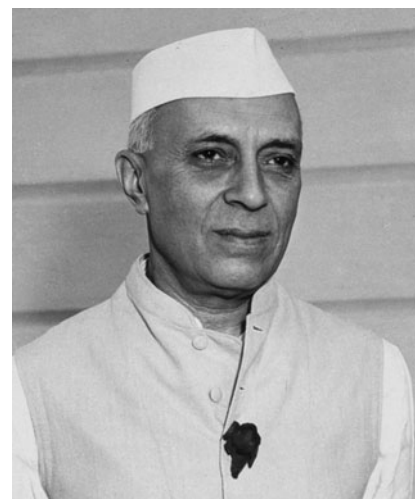
Nehru met Gandhi in 1916. At that time Great Britain ruled India as a colony. Nehru soon became involved in Gandhi's fight to win India's independence from Britain. Nehru joined the Congress Party, the political group that Gandhi led. In 1929 Gandhi picked Nehru to lead the Congress Party. Nehru angered the British with his work for independence. Between 1921 and 1945 he was jailed nine times.

In 1947 the British finally left India. Nehru then became prime minister of India. He worked to make the country more modern. For example, he encouraged research in science and technology. He also changed ancient laws to give Indian women more rights.

Nehru remained prime minister until his death. He died in New Delhi, India, on May 27, 1964. His daughter, Indira Gandhi, became prime minister two years later.

► More to explore

Gandhi, Indira • Gandhi, Mahatma • India



Jawaharlal Nehru

Nepal



A light dusting of snow covers a village in the mountains of Nepal. Most of the country is mountainous.

Nepal is a small, mountainous country in Asia. Mount Everest, the highest mountain in the world, is on Nepal's northern border. For a long time the mountains kept Nepal closed to the outside world. Nepal's capital is Kathmandu.

Geography

Nepal sits south of China and north of India. The part of China that borders Nepal is called Tibet.

Along its southern border Nepal has low, flat plains. From there the land slopes up to a region of hills and then mountains. In the north are the towering mountains of the Himalayas. The major rivers of Nepal are the Kosi, the Narayani (or Gandak), and the Karnali.

Most of Nepal has a mild climate. The weather is colder and snowier in the higher areas.

Plants and Animals

Native trees such as sissoo and sal grow in the plains and the hills. Pine, oak, poplar, and walnut trees grow in the lower mountains. The forests of the Himalayas contain spruce, fir, cypress, juniper, and birch trees.

Nepal's wildlife includes tigers, leopards, deer, and rhinoceroses. Some people believe that a monster called the Yeti, or Abominable Snowman, lives in Nepal's high, snow-covered mountains. Most people do not believe that the Yeti exists.

People

The population of Nepal includes several ethnic groups. The Tharu, the Newar, and other groups have Indian ancestors. Other peoples, such as the Tamang and the Sherpa, have Tibetan roots. Nepali is the country's main language. Most people live in rural areas in the hilly center of the country.





A man stands next to a selection of brightly colored powders in Kathmandu, Nepal. People use the powders during Hindu festivals.

Facts About NEPAL



Population
(2008 estimate)
28,757,000

Area
56,827 sq mi
(147,181 sq km)

Capital
Kathmandu

Form of government
Constitutional monarchy

Major cities
Kathmandu, Biratnagar, Lalitpur, Pokhara, Birganj

Hinduism is the main religion. However, Hinduism and Buddhism have existed side by side in Nepal for centuries. Legends even say that the Buddha, the man who started Buddhism, was born in Nepal.

Economy

Nepal is one of the poorest countries in the world. Most of the people work in farming. Rice, corn, wheat, potatoes, and sugarcane are the main crops. Farmers also raise cattle, goats, buffalo, pigs, and sheep.

Factories in Nepal make clothing, carpets, and pashmina (a fabric of fine wool and silk). Other products include wood from the country's many forests and a plant fiber called jute. Tourism is another source of money for Nepal.

History

In ancient times Hindu kings from India ruled the Nepal region. In 1769 a ruler named Prithvi Narayan Shah conquered a number of small kingdoms. Shah's territory became the modern state of Nepal.

The Rana family took control from the Shah family in 1846. The Rana gave Great Britain some power in Nepal. A revolution forced out the Rana government in 1951. A Shah family member then took back power as king.

Birendra Shah became king in 1972. In 1990 there were many protests over the king's absolute power. A new constitution allowed political parties and established a two-house legislature.

A group of rebels began fighting the government in 1996. The rebels wanted to set up a Communist government.

In 2001 King Birendra's son shot and killed the king, other members of the royal family, and himself. King Birendra's brother Gyanendra then became king. He tried to take control of the government to stop the ongoing fighting by the rebels. This led to more protests. In 2006 Gyanendra gave up control, and the rebels signed a peace agreement with the government. The Nepalese people elected a new assembly in 2008. The new government then voted to declare Nepal a democratic republic.

► More to explore

Buddhism • Everest, Mount • Hinduism • Kathmandu

Neptune

Neptune is one of the planets that orbit, or travel around, the sun in the solar system. It is a huge, distant planet that is deep blue in color. It is a stormy world. The planet has the fastest winds ever discovered in the solar system.

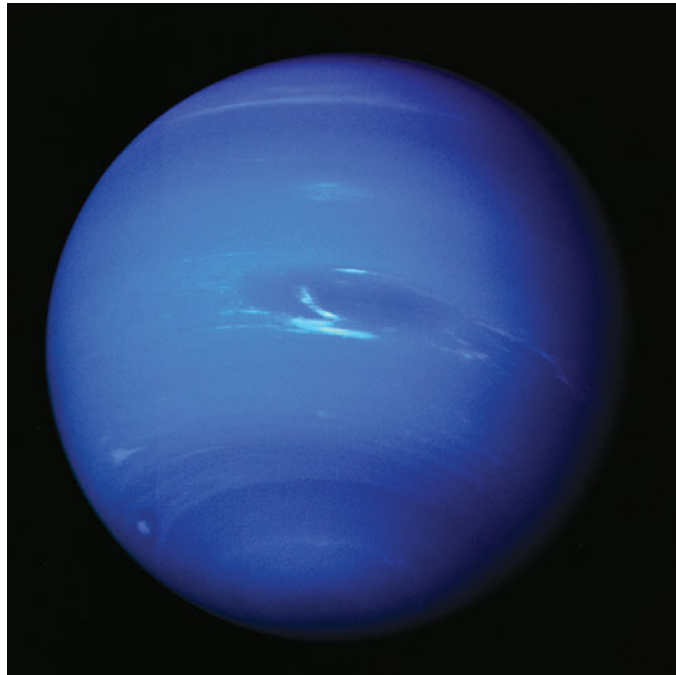
Neptune is about 3 billion miles (4.8 billion kilometers) from the sun. Neptune is the eighth and last planet from the sun. Pluto, a dwarf planet, is usually farther from the sun than Neptune. However, about every 228 years Pluto's path takes it closer to the sun than Neptune. Then Neptune stays beyond Pluto for 20 years. This last occurred from 1979 to 1999.

Physical Features

Neptune is nearly as big as its inner neighbor, the planet Uranus. Neptune's diameter, or distance through its center, is about 31,000 miles (50,000 kilometers). That is about four times as big as Earth's diameter.

Neptune is a kind of planet called a gas giant. It is made up mostly of gases, mainly hydrogen and helium. A small amount of the gas methane makes Neptune appear blue. The planet has no solid surface. Scientists think that Neptune has hot, thick liquids deep inside it.

A system of narrow rings surrounds Neptune. The rings are not as large as the rings of the planet Saturn. They are made up of dust.



The spacecraft Voyager 2 flew for 12 years before it got close enough to Neptune to send a clear photograph back to Earth. The planet's surface appears to be smooth because it is made of gas.

Orbit and Spin

Like all planets, Neptune has two types of motion: orbit and spin. Neptune orbits, or travels around, the sun very slowly. It takes Neptune about 165 Earth years to complete one orbit. In other words, a year on Neptune is equal to about 165 Earth years.

Neptune spins about its center rapidly. It completes one rotation in about 16 hours, so a day on Neptune lasts about 16 hours.

Moons

More than 10 moons orbit Neptune. Its largest moon, Triton, is nearly as big as Earth's Moon. Scientists believe that Triton might have formed as an independent planet. However, because of a

force called gravity, Neptune may have pulled Triton into its orbit.

Observation and Exploration

Neptune is a huge planet. However, it is so far away that people on Earth cannot see it without a telescope. In 1846 the German astronomer Johann Gottfried Galle discovered Neptune with a telescope. Only one spacecraft has visited Neptune. The unmanned U.S. spacecraft Voyager 2 flew by the planet in 1989.

► More to explore

Planets • Pluto • Solar System • Space Exploration • Uranus

Neptune, god

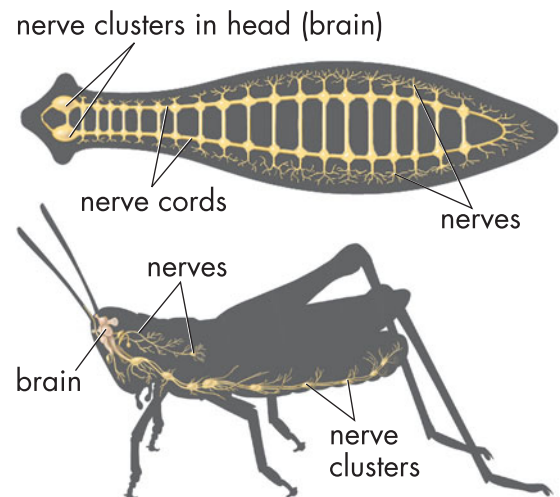
► see Poseidon.

Nervous System

Animals constantly use their senses to gather information about their surroundings. Nerves in the body pick up this information. In most animals the nerves send the information to the brain or a similar organ. The brain makes sense of the information. It then sends a message back through the nerves to tell the body how to react. This network of nerves and brain is called the nervous system.

Brain and Spinal Cord

In mammals and other animals with backbones the brain and the spinal cord form the central part of the nervous system. The spinal cord is a long bundle



Animals without a backbone have simple nervous systems. A flatworm (top) has nerve clusters instead of a true brain. A grasshopper (bottom) has a larger group of nerve clusters for a brain.

of major nerves. It runs from the brain down an animal's back. Nerves throughout the body carry information to and from the central nervous system.

Neurons

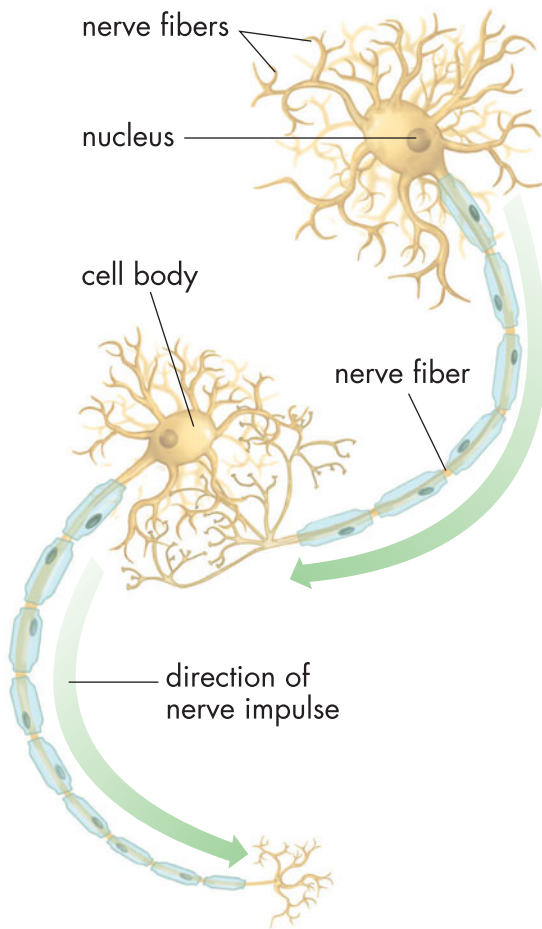
The nerve cells, or neurons, are the basic units of the nervous system. The human body contains billions of neurons. More than 10 billion neurons make up the brain.

Neurons have a nucleus, or center, and two or more long fibers, or threads. Impulses travel to and from the neurons along these fibers.

Neurons are not able to reproduce as some other cells do. They cannot divide themselves to create more neurons. Neurons in most of the body can regrow if they are slightly damaged. However, neurons in the brain and spinal cord cannot regrow at all. This is why severe

Did You Know?

Some types of nerve cells are several yards long.



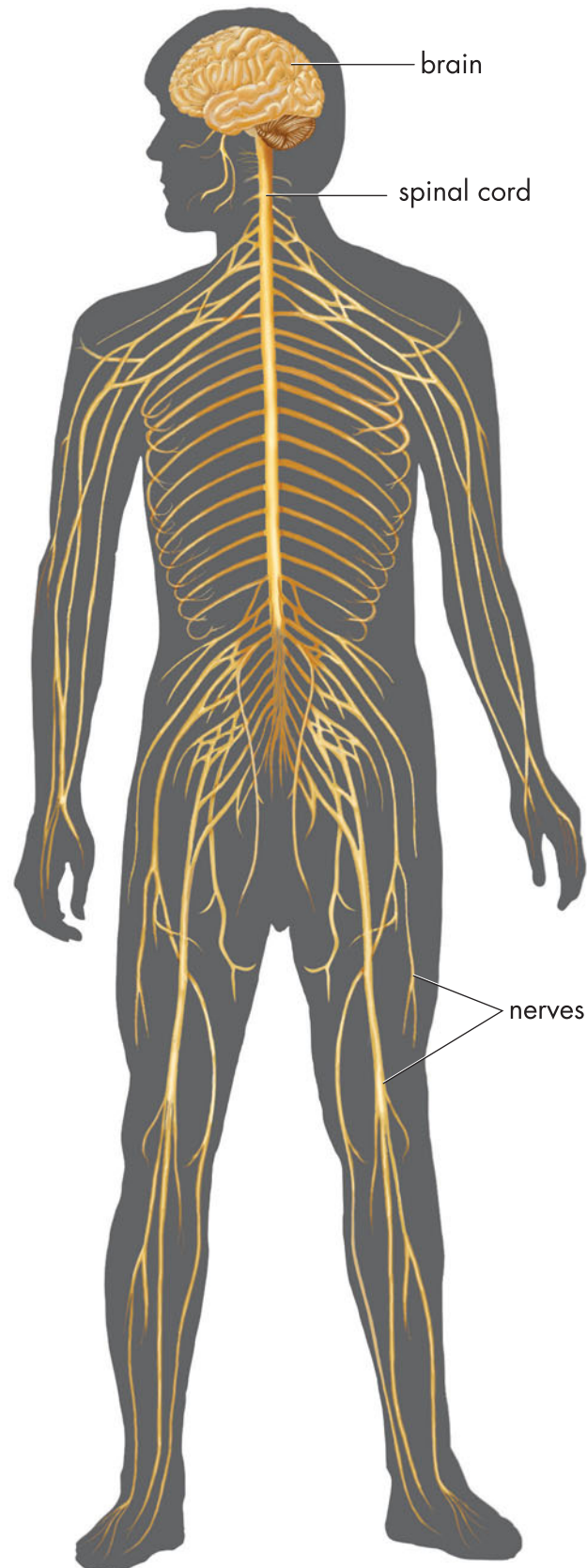
Nerve cells, called neurons, include a nucleus (center) and two or more long fibers, or threads. Impulses travel between neurons along these fibers.

damage to the brain or the spinal cord is permanent.

Nerves

Nerves are bundles of neuron fibers. Nerves run throughout the body. Some nerves, called cranial nerves, run directly to the brain. The rest of the nerves connect with the spinal cord. The nerves in the spinal cord run to and from the brain.

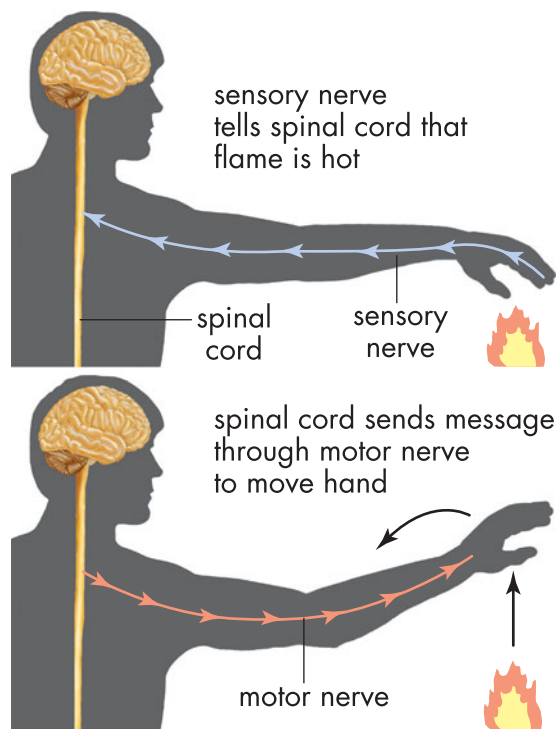
There are two main types of nerves: sensory nerves and motor nerves. Sensory nerves handle information



The human nervous system includes the brain, the spinal cord, and the nerves that run throughout the body.

relating to the senses. They send information from the eyes, ears, mouth, nose, skin, and other body parts to the spinal cord and brain. Motor nerves carry messages in the other direction. They send information from the brain and spinal cord to muscles and other body parts.

For example, when a person touches a hot stove, the sensory nerves in the fingers send impulses to the spinal cord. The impulses say that the stove is too hot to touch. The spinal cord then sends impulses through motor nerves to the muscles of the arm. These impulses tell the muscles to pull the arm away from the stove.



Sensory nerves send messages from the eyes, ears, mouth, nose, skin, and other body parts to the spinal cord and brain. Motor nerves send messages from the brain and spinal cord to muscles and other body parts.

Autonomic nerves are a special type of motor nerve. These nerves control the organs inside the body. They regulate breathing, heartbeat, body temperature, the digestive system, and other activities.

Problems with the Nervous System

Many injuries and diseases can affect the nervous system. Damage to the spinal cord can lead to paralysis. When a person is paralyzed they cannot move. Paralysis happens because the damaged nerves block messages that tell the muscles to move. Multiple sclerosis and poliomyelitis are diseases that attack nerves. Alzheimer's disease and Parkinson's disease destroy neurons in the brain. Meningitis is a swelling of the thin coverings around the spinal cord and brain.

► More to explore

Brain • Muscle • Senses

Nest

A nest is a structure in which an animal lives or keeps its young. Birds are well known for building nests for their eggs. Some fish, amphibians, reptiles, mammals, and insects also build nests.

Birds' Nests

Birds build nests in trees, in bushes, in caves, on high rock ledges, or on buildings. Some make nests on the ground or underground. Many birds build cup-shaped nests. Others make domed nests or nests that hang from tree limbs like



Some types of bird are called weavers because they weave their nests out of plant fibers.

long bags. The size of the nest depends on the type of bird. A hummingbird's nest is no bigger than a baby's fist. An adult person could lie down in the largest eagle's nest.

Birds use a wide range of building materials. Besides twigs and grass, they might use mud, feathers, plant fuzz, and bits of spiderweb. Some birds use their saliva to bind the materials together. Weavers are some of the most skilled nest builders. They make complex nests by weaving together long strands of grass with their beaks.

Nests of Other Animals

Most other animals build simple nests. Some fish hollow out nests in underwater gravel or sand. Other fish nest in plants. Frogs make nests out of mud or hardened froth that floats on the water's surface. Alligators build mounds of

grasses and mud. Cobras push together nests of leaves.

Many small mammals also build nests with plant material. Tree squirrels use twigs and leaves to build nests in trees. Rabbits, mice, moles, and gophers make their nests underground.

Insects that live together in colonies build some of the most elaborate nests. Ant and termite nests often have many long tunnels running underground. They also have separate chambers for the queen and the growing larvae, or young. Honeybee nests, or hives, have a core called a honeycomb. The honeycomb is made of many six-sided wax cells. This is where the queen bee lays her eggs. Paper wasps build paperlike nests out of wood that they have chewed up and spit out.

► More to explore

Ant • Bee • Bird • Cobra • Fish
• Squirrel • Termite • Wasp



Paper wasps build nests with many cells, or compartments. Each cell holds one egg.



Netherlands, The

The Netherlands is a small country in northwestern Europe. It is also known as Holland. The people of The Netherlands are called the Dutch. The country's capital is Amsterdam. However, the government meets in the city of The Hague.

Geography

The Netherlands shares borders with Germany and Belgium. The North Sea lies to the west and north. The country includes the Caribbean islands of Aruba and the Netherlands Antilles.

The Netherlands is low-lying and mostly flat. Rivers and canals connect many of the cities. The climate is cool and rainy.

Much of the land near the coast used to be underwater. Beginning in the Middle Ages the Dutch drained the land using windmills and, later, pumps. They built barriers such as dikes and dams to keep



Windmills built in the 1700s line a waterway in Kinderdijk, The Netherlands.

the water out. The lands taken from the sea are called polders.

Plants and Animals

Forests cover only about 10 percent of the land. Animals include hedgehogs, moles, badgers, otters, and mice. Many sea and land birds also live in the country.

People

Dutch people make up most of the population. There are small groups of Turks, Indonesians, Moroccans, and others. About half of the people are Christians. Many people follow no religion. Dutch is the main language. About 90 percent of the people live in cities.

Economy

International trade and services are important parts of the economy. Many goods pass through The Netherlands on their way to and from other countries of western Europe. The Netherlands' major



services include banking, insurance, communications, and tourism.

Factories make food products, metals, chemicals, electrical machinery, transportation equipment, and petroleum (oil) products. The Netherlands also has large fields of natural gas.

Farmers grow vegetables, grains, potatoes, and sugar beets. They also raise pigs, cattle, poultry, and sheep. The Dutch produce many flowers, especially tulips.

History

Early History

The Roman Empire conquered the region more than 2,000 years ago. The area later divided into many small states. The lands that are now The Netherlands, Belgium, and Luxembourg became known as the Low Countries. In the 1400s the Low Countries came under the control of the Hapsburg family of Austria.

The Low Countries passed to the Hapsburg rulers of Spain in the 1500s. The Dutch began fighting Spain in 1568. In 1579 the Dutch set up the United Provinces of the Netherlands. The war continued until Spain accepted Dutch independence in 1648.

In the 1600s the Dutch built a large empire around the world. They set up colonies in North America, South America, Asia, and Africa. The Dutch fought many wars with England during this time.



A girl in The Netherlands wears traditional Dutch clothing and carries armfuls of tulips. The Dutch are famous for growing the flower.

Kingdom of The Netherlands

In 1795 the French invaded the Low Countries. After the French were defeated in 1815, the Kingdom of The Netherlands was created. Belgium and Luxembourg soon broke away to form separate countries.

Nazi Germany ruled The Netherlands during World War II (1939–45). The Germans sent away and killed most of the country's Jews.

After the war The Netherlands granted independence to its remaining colonies. They became the countries of Indonesia, Papua New Guinea, and Suriname. The Netherlands also joined the European Economic Community (now the European Union).

► More to explore

Amsterdam • European Union • Hague, The • Hapsburgs • Levee and Dike

Facts About THE NETHERLANDS



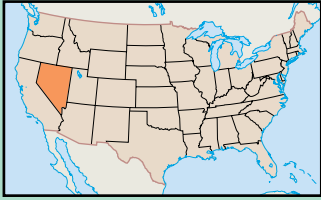
Population
(2008 estimate)
16,433,000

Area
16,034 sq mi
(41,528 sq km)

Capital
Amsterdam

Form of government
Constitutional monarchy

Major cities
Amsterdam, Rotterdam, The Hague, Utrecht, Eindhoven



Nevada

The U.S. state of Nevada takes its name from a Spanish word meaning “snow-capped.” The name refers to the state’s high mountain ranges where snow remains throughout the year.

Nevada is sometimes called the Silver State because silver mining was once very important there. The nickname Sagebrush State comes from the state’s abundant growth of wild sage. The capital is Carson City.

Geography

Nevada is a Western state that is bordered on the north by Oregon and Idaho. It is bordered on the east by Utah, on the southeast by Arizona, and on the southwest and west by California.



Nevada has three natural regions. The largest region covers the majority of the state. It is characterized by rugged mountain ranges, long, flat valleys, and sandy deserts. There is a plateau, or raised, flat region, along the state’s northeastern edge. The third region is the Sierra Nevada mountain range in the west. It overlooks Lake Tahoe, the country’s largest mountain lake.

The Colorado River flows along the Arizona border. Boundary Peak is the highest point in the state at 13,140 feet (4,005 meters). The state’s weather varies with the landscape. It can be very cold in the high mountains and very hot in the desert.

People

Whites make up about two thirds of Nevada’s population. Hispanics represent about one fifth of the population. Almost 7 percent of the residents are African American, and about 5 percent are Asian.

Economy

Tourism and casinos are Nevada’s leading industries. Manufacturing is a small part of the economy. The state’s factories process food, make metal products, and produce plastics and rubber items.

Cattle are the primary source of income from agriculture. Dairy products and hay are also important. Southwestern Nevada is part of one of the richest min-



Rugged mountains and desert cover much of Nevada.

ing regions in the country. The state's most valuable mineral is gold.

History

The first European explorers in the area were Spanish missionaries and fur traders in the 1700s and early 1800s. They found several Native American tribes in the area: the Shoshone, the Northern Paiute, the Southern Paiute, and the Washo. The region was claimed by Spain until 1821 and by Mexico until 1848. The United States gained the area after the Mexican War (1846–48). The discovery of a large deposit of silver in 1859 attracted people from all over the world. Nevada was organized as a territory in 1861. It joined the Union as the 36th state on October 31, 1864.

Nevada's real prosperity did not come until after 1931, when the state legalized gambling. Nevada soon became known as a resort center. Also in the 1930s the

Hoover Dam was constructed on the Colorado River. The project provided many jobs for people in the area. The dam includes a power plant that generates electricity. This allowed more factories to open in the area and encouraged economic growth. The dam also created a large lake called Lake Mead.

In the 1950s the federal government made Nevada a major testing site for nuclear weapons. This encouraged the development of technical industries within the state. The main area of growth, however, was in the tourist trade. Many people travel to Nevada for entertainment in Las Vegas and Reno. Many others enjoy the scenery of the state and outdoor activities such as hiking in the mountains or boating on Lake Mead.

► More to explore

Carson City

Facts About NEVADA

Flag



Population

(2000 census)
1,998,257—
rank, 35th state;
(2008 estimate)
2,600,167—
rank, 35th state

Capital

Carson City

Area

110,561 sq mi
(286,351 sq
km)—rank, 7th
state

Statehood

October 31,
1864

Motto

All for Our
Country

State bird

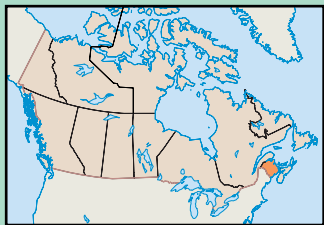
Mountain
bluebird



State flower

Sagebrush





New Brunswick

New Brunswick is one of the four original Canadian provinces. It is located in eastern Canada. The beautiful coastline of New Brunswick gave the province its nickname, the Picture Province. New Brunswick's official name came from the British royal family of Brunswick. Its capital is Fredericton.

Geography

New Brunswick, Nova Scotia, and Prince Edward Island are known as the Maritime Provinces. New Brunswick is the largest of the three. Inlets of the Atlantic Ocean surround New Brunswick on three sides. A narrow strip of land connects the province with Nova Scotia. A bridge links New Brunswick to Prince Edward Island. Quebec and the U.S. state of Maine lie to the west.

People

Many of New Brunswick's people have English, Irish, Scottish, or French ancestors.



The Cape Enrage Lighthouse stands at the entrance to the Bay of Fundy in New Brunswick.

Later immigrants came from other parts of Europe and Asia. Small numbers of American Indians and blacks also live in the province.

English and French are both official languages of the province. Most of the people speak English. About one third speak mainly French. They live mostly in the north and east. The University of New Brunswick is Canada's oldest English-language university.

About half the people in New Brunswick live in cities. Saint John is the province's largest and oldest city. Farther north along the Saint John River sits New Brunswick's capital city, Fredericton. Moncton, the second largest city, is a port in the southeast.

Economy

Factories in New Brunswick produce a variety of goods, including food, paper, wood and metal products, and machinery. Forests, which cover much of the province, provide wood and pulp for paper. Tourism is an important service industry.

The province's waters offer many types of fish, lobsters, and crabs. Mines provide such metals as antimony, bismuth, lead, silver, and zinc. The land is also a source of peat and coal, both of which are used for fuel.

Only a small part of New Brunswick's land is used for agriculture, but farming is still important to the economy. The province is known for its potatoes. Eggs, poultry, berries, apples, and dairy products also come from the province.

History

New Brunswick's first people were Algonquian-speaking Indians, including the Micmac and the Malecite. In 1534 the French explorer Jacques Cartier landed on the east coast of what is now New Brunswick. In 1604 the French explorer Samuel de Champlain helped to establish the first French settlement in the region. French settlers gave the name Acadia to what are now New Brunswick and Nova Scotia.

In 1755 the British drove most of the French out of Acadia. Then the British started to settle in New Brunswick. During the American Revolution (1775–83) thousands of people from the American Colonies who remained loyal to the



The 1,282-foot (391-meter) covered bridge in Hartland, New Brunswick, is the world's longest covered bridge.

British moved to New Brunswick. They founded the city of Saint John. In 1784 the British separated New Brunswick from Nova Scotia and made it a separate colony. New Brunswick became known for shipbuilding.

Along with Nova Scotia, Ontario, and Quebec, New Brunswick became a province of the new country of Canada in 1867. Railroads built during the late 1800s helped New Brunswick's manufacturing industries to grow. New industries, including oil refining and power plants, developed in the 1900s. However, many young people left New Brunswick to work in the large cities in Quebec and Ontario.

► More to explore

Algonquian • American Revolution • Atlantic Ocean • Canada • Cartier, Jacques • Champlain, Samuel de • Nova Scotia • Prince Edward Island

Facts About NEW BRUNSWICK

Flag



Population
(2006 census)
729,997

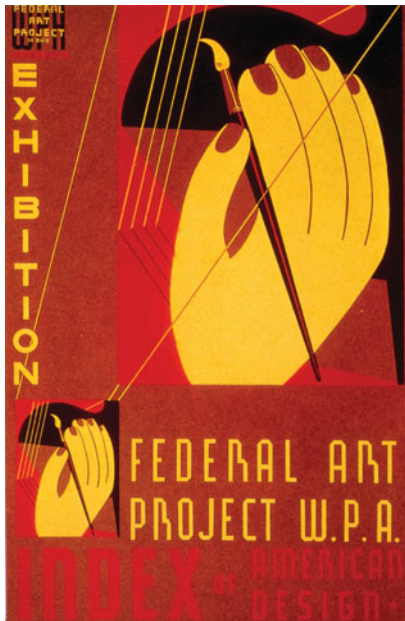
Area
28,150 sq mi
(72,908 sq km)

Capital
Fredericton

Motto
Spem Reduxit
(Hope Was
Restored)

**When New
Brunswick
Became a
Province**
1867

New Deal



A poster from the 1930s advertises an art exhibit sponsored by the Works Progress Administration, a New Deal program.

The New Deal was a group of U.S. government programs of the 1930s. President Franklin D. Roosevelt started the programs to help the country recover



Men in the Civilian Conservation Corps work in the Saint Joe National Forest in Idaho.

from the economic problems of the Great Depression.

Some New Deal programs gave jobs to unemployed people. The Civilian Conservation Corps (CCC) put young men to work in national forests. The Works Progress Administration (WPA) created many different kinds of jobs. Some WPA workers built roads, schools, or airports. Others created art for public buildings or set up community theaters.

The best-known results of the New Deal include Social Security and the Tennessee Valley Authority (TVA). Social Security is a system that continues to provide income for retired or disabled workers. The TVA built dams and electric power plants on the Tennessee River. It still provides electricity to seven Southern states.

Other New Deal programs were supposed to fix some of the problems that led to the Great Depression. During the Great Depression many people lost money when banks closed. As part of the New Deal the government set up the Federal Deposit Insurance Corporation (FDIC). It was meant to get people to trust banks again. The FDIC pays people when their bank loses money or has to close.

► More to explore

Great Depression • Roosevelt, Franklin D.

New Delhi, India

► see Delhi.

Newfoundland and Labrador



Newfoundland and Labrador is Canada's easternmost province. The province includes the island of Newfoundland and a region called Labrador on the mainland of North America. Originally called simply Newfoundland, the province has been known as Newfoundland and Labrador since 2001. The capital of the province is Saint John's.

Geography

The island of Newfoundland lies in the Atlantic Ocean. The narrow Strait of Belle Isle separates the island from Labrador, to the northwest. Quebec, New Brunswick, Prince Edward Island,

and Nova Scotia lie to the west and southwest.

Many bays and coves line Newfoundland's coast. The Long Range Mountains run through the west. At the island's southeast corner is the Avalon Peninsula, the easternmost point in North America.

Labrador is a rugged chunk of land that borders northeastern Quebec. It is more than two and a half times the size of Newfoundland. The Torngat Mountains in the north include some of the highest peaks in eastern Canada.

People

The majority of the province's people live on the island of Newfoundland. Most of the people's ancestors came from England or Ireland. Smaller numbers of residents have Scottish, French, American Indian, or Eskimo (Inuit) origins. Nearly everyone speaks English, but some people speak mainly French.

Saint John's, located on the Avalon Peninsula, is the province's only large city. Built in the early 1600s, Water Street in Saint John's may be the oldest street in North America. The one university in the province, Memorial University, is also in Saint John's. Labrador City is an important mining center in southwestern Labrador.





Many scenic villages lure tourists to the island of Newfoundland.

Economy

Services, including finance, public administration, and health, are the largest part of the province's economy. Oil reserves and iron, gold, copper, and nickel mines also bring in billions of dollars. Fishing is an important part of the economy. Factories produce wood, paper, and fish products. Construction and tourism are growing industries.

Because the province has a short growing season and little fertile land, there are few farms.

History

Among the first people of Labrador were Algonquian-speaking Indians called the Innu. The Eskimo also lived in Labrador before Europeans arrived. The Beothuk Indians lived on Newfoundland. The last known Beothuk died in the 1800s.

The first Europeans to visit Labrador were the Vikings, who were sailors from northern Europe. Some Vikings had

settled on the island of Greenland, to the east of Newfoundland. In about AD 1000 a few Vikings sailed west, discovered Newfoundland, and built a settlement there. The settlement lasted only a few years.

In 1497 the Italian explorer John Cabot landed somewhere in Newfoundland and Labrador or on a nearby island. He described the place he landed as the "new founde lande." England, France, and Portugal soon fought over the right to fish there. By the 1700s Newfoundland belonged to England. During the 1800s the island became a self-governing part of the British Empire.

In 1927 Newfoundland gained control of Labrador. Newfoundland stayed apart from Canada until 1949, when it became the 10th Canadian province.

► More to explore

Cabot, John • Canada • Vikings



In the late 20th century people reconstructed some Viking buildings in northern Newfoundland. They wanted to honor Newfoundland's Viking settlers.

Facts About NEWFOUNDLAND AND LABRADOR

Flag



Population
(2006 census)
505,469

Area
156,453 sq mi
(405,212 sq km)

Capital
Saint John's

Motto
*Quaerite Prime
Regnum Dei*
(Seek Ye the
Kingdom of God)

**When
Newfoundland
Became a
Province**
1949

New Hampshire

Residents of the U.S. state of New Hampshire are proud of their New England history. New Hampshire is named after the English county of Hampshire. It received its name in 1629, only a few years after it was first settled by the English. About 150 years later New Hampshire was the first of the 13 American Colonies to declare independence from England.

New Hampshire is nicknamed the Granite State because of its granite resources. Granite is a hard, gray stone that is used in building projects. The state capital is Concord.

Geography

New Hampshire is located in the north-eastern part of the United States. It is

bordered on the north by the Canadian province of Quebec, on the west by Vermont, on the south by Massachusetts, and on the east by Maine and the Atlantic Ocean.

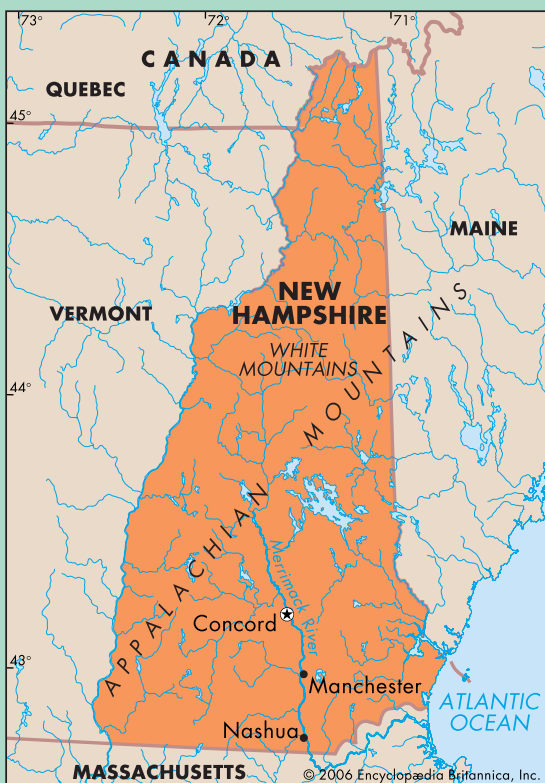
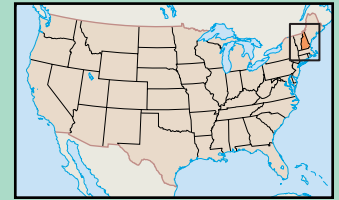
The White Mountains cover the northern third of the state. They are part of the Appalachian mountain range. Most of the southern two thirds of the state is a region of low mountains, lakes, and fertile river valleys. New Hampshire's winters are long and often very cold. The summers are pleasantly warm.

People

Almost all of New Hampshire's residents are white and of European descent. Hispanics are the largest minority group in the state. They account for about 2 percent of the population. New Hampshire's earliest European settlers came from England. Scots-Irish settlers began to arrive in about 1719. During the 1800s and 1900s, immigrants came to the state from central and eastern Europe.

Economy

The economy of New Hampshire is based mainly on services and manufacturing. Manufacturing firms in the state create computer products and electronic equipment. Other businesses manufacture metal, rubber, and plastic products. Finance and real estate are some of the important parts of the service industry. Tourism is also a major part of the service industry. Many people travel to



Facts About NEW HAMPSHIRE

Flag



Population
(2000 census)
1,235,786—
rank, 41st state;
(2008 estimate)
1,315,809—
rank, 41st state

Capital
Concord

Area
9,350 sq mi
(24,216 sq km)—
rank, 46th state

Statehood
June 21, 1788

Motto
Live Free or Die

State bird
Purple finch



State flower
Purple lilac



New Hampshire to enjoy the scenery of the mountains.

The leading sources of agricultural income are dairy products and such nursery and greenhouse crops as flowers and shrubs. New Hampshire's maple trees provide maple syrup and maple sugar.

History

The Pennacook were the most powerful Native American tribe living in the region before European settlers arrived. The first European settlement was established by the English in 1623.

In 1641 New Hampshire came under the control of the colonial government of Massachusetts. New Hampshire became a separate province in 1679, but boundary disagreements with Massachusetts continued into the 1700s. In 1741 the first governor of New Hampshire was appointed.

New Hampshire patriots captured a British military post in 1774—several

months before the start of the American Revolution (1775–83). New Hampshire also declared itself independent from Britain several weeks before the Declaration of Independence was signed on July 4, 1776.

New Hampshire also played an important role in the early years of the United States. On June 21, 1788, the state cast the deciding vote to approve the new U.S. Constitution.

In the 1800s New Hampshire became a manufacturing state. Manchester developed into a center of the textile industry, and Portsmouth became known for shipbuilding.

In the early 21st century New Hampshire began producing new goods that helped its economy grow. These included high-technology products such as circuit boards and semiconductor devices, which make electronics run.

► More to explore

American Revolution • Concord



Trees show their autumn colors in New Hampshire's White Mountains.

New Jersey

Early settlers from England named the colony of New Jersey after the island of Jersey in the English Channel. When it became a state New Jersey gained the nickname of the Garden State. At the time it had many farms in the west and south. Although it is one of the country's smallest states in area, it has one of the largest populations. In fact, New Jersey is the most densely populated state in the United States. The capital is Trenton.

Geography

New Jersey is located in the Middle Atlantic region of the United States. It is surrounded by water on all sides except for a northern border it shares with New York. The Atlantic Ocean lies to the east. The Hudson River separates New

Jersey from New York City in the northeast. To the west across the Delaware River are Pennsylvania and Delaware.

The southern part of New Jersey is covered by a coastal plain. Much of this area is marshland. North of the coastal plain is a region of rolling upland. Farther north is a region of wooded hills. In the northwest corner of the state are the Kittatinny Mountains, which are part of the Appalachian mountain range. New Jersey has a humid climate with cold winters and warm summers.

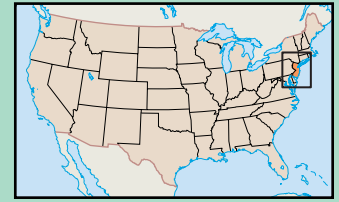
People

Whites of European heritage account for about three fourths of New Jersey's population. Italian Americans are the largest ethnic group in New Jersey. The state also has large communities of Germans, Russian and eastern European Jews, Irish, Poles, Hungarians, Puerto Ricans, and Cubans. African Americans and Hispanics each make up about 14 percent of the population.

The most crowded part of New Jersey is the northeast, which is near New York City. New Jersey's four largest cities—Newark, Jersey City, Paterson, and Elizabeth—are part of the New York City metropolitan area.

Economy

New Jersey is a center for scientific and technological research. It is one of the country's leading producers of chemicals



Facts About NEW JERSEY

Flag



Population

(2000 census)
8,414,350—
rank, 9th state;
(2008 estimate)
8,682,661—
rank, 11th state

Capital

Trenton

Area

8,721 sq mi
(22,588 sq km)—
rank, 47th state

Statehood

December 18,
1787

Motto

Liberty and
Prosperity

State bird

Eastern goldfinch



State flower

Violet



A row of brightly painted houses stands in Cape May, New Jersey.

and pharmaceuticals. The state economy also depends on service industries such as insurance, finance, and tourism.

New Jersey is a major producer of fruits and vegetables. Its major fruits are cranberries, blueberries, and peaches. Important field crops are soybeans, corn, and hay. Dairy products are also valuable.

History

The Lenni Lenape (or Delaware) Indians lived in the New Jersey area before European settlers arrived. In 1524 the Italian explorer Giovanni de Verrazano became the first European to land in the area. Henry Hudson, an Englishman exploring for the Dutch, arrived in 1609. Dutch and Swedish traders established the first settlements in the area.

England took over the region in 1664. In 1676 the province was divided into East and West Jersey. New Jersey was reunited as a royal colony in 1702, under the governor of New York. It was separated from New York in 1738.

New Jersey was the site of many battles during the American Revolution. In two

of the most important battles, George Washington defeated the British at Trenton and Princeton in late 1776 and early 1777.

At the Constitutional Convention of 1787, New Jersey called for each state, regardless of size, to have the same number of representatives in the U.S. Congress. This idea, called the New Jersey Plan, was designed to help small states. The plan helped lead to the creation of the Senate as one of the two houses of Congress. Each state has two members in the Senate.

Between the Revolution and the American Civil War (1861–65) New Jersey underwent great industrial development. During and after both world wars, in the first half of the 20th century, there was further growth of factories. The factories helped the economy by offering jobs to many people. However, they also led to major problems with pollution. In the 21st century the state tried to address those problems.

► More to explore

American Revolution • Trenton

New Mexico

Nicknamed the Land of Enchantment, the U.S. state of New Mexico is graced with desert and mountain landscapes of great beauty. It is located in the southwestern United States and shares a border with the country of Mexico. Because of its location and history, New Mexico is a blend of three cultures—Native American, Spanish American, and American. The state capital is Santa Fe.

Geography

New Mexico is bordered by Arizona on the west and Colorado on the north. Oklahoma and Texas are on its eastern border, and Texas and Mexico are to the south.

The Rocky Mountains cover the north-central region of the state. Eastern New Mexico is a high plains region. Most of

the rest of New Mexico has many short mountain ranges. In the northwest is a region of mesas, or flat-topped hills. There are two major rivers, the Rio Grande and the Pecos. New Mexico has a dry and pleasant climate with lots of sunshine.

People

Unlike most states, New Mexico has large Hispanic and Native American populations. More than two fifths of New Mexico's population is of Spanish origin. About half of this group are Mexican Americans. The others are descendants of the original Spanish settlers. Whites with roots in other European countries make up another two fifths of the population.

Native Americans make up about one tenth of the state's population. The largest tribes are the Pueblo and the Navajo. Other tribes include the Zuni, the Apache, and the Ute.

Economy

Manufacturing in New Mexico includes the production of electronic equipment, food processing, and oil refining. The federal government conducts military and energy research at laboratories in Los Alamos and Albuquerque. The U.S. military tests missiles and electronic systems at several bases. Tourism is also important to the economy.

The sale of cattle and dairy products are the state's largest sources of agricultural



Facts About NEW MEXICO

Flag



Population

(2000 census)
1,819,046—
rank, 36th state;
(2008 estimate)
1,984,356—
rank, 36th state

Capital

Santa Fe

Area

121,590 sq mi
(314,915 sq
km)—rank, 5th
state

Statehood

January 6, 1912

Motto

Crescit Eundo (It
Grows as It Goes)

State bird

Roadrunner



State flower

Yucca



income. New Mexico is rich in minerals and energy resources. It is among the leading states in the production of petroleum (oil) and natural gas.

History

Native American villages dotted New Mexico long before Spanish explorers and missionaries arrived. In 1540 the Spaniard Francisco Coronado entered the area while searching for legendary cities of gold. Santa Fe was founded in 1610. An Indian uprising in 1680 forced the Europeans out for a time, but by 1700 the Spanish had returned.

The land that is now New Mexico became part of Mexico when that country gained its independence from Spain in 1821. By that time the trade route known as the Santa Fe Trail had increased business dealings between New Mexico and the United States. After Mexico's defeat in the Mexican War (1846–48), New Mexico was trans-

ferred to the United States. In 1850 the U.S. Congress created the Territory of New Mexico.

Native Americans and white settlers in the area often fought one another. The Apache were particularly feared for their attacks on settlements and wagon trains. During the late 1800s the Native American tribes were defeated and forced to settle on reservations.

New Mexico was admitted to the Union in 1912 as the 47th state. During World War II (1939–45) the world's first atomic bomb was built in Los Alamos. It was tested on July 16, 1945, near Alamogordo. The population of New Mexico has grown rapidly since the 1950s. Between 1990 and 2008 the state's population increased by more than 30 percent.

► More to explore

Coronado, Francisco • Santa Fe



Acoma is a Native American village on top of a high mesa in New Mexico. It was first settled more than 1,000 years ago. Acoma people still live in the village today.

New South Wales



New South Wales is one of Australia's six states. It is rich in natural beauty, historical places, and modern businesses. Australia's largest city, Sydney, is the capital of New South Wales. The state also contains the Australian Capital Territory, where the country's capital, Canberra, is located.

Geography

New South Wales lies in southeastern Australia. The Pacific Ocean borders the state on the east. Three states border New South Wales: Victoria on the south, South Australia on the west, and Queensland on the north.

Mount Kosciuszko, Australia's highest point, is about 100 miles (160 kilometers) southwest of Canberra. It rises 7,310 feet (2,228 meters). The Darling, Australia's longest river, cuts across the northwest. Other major rivers of New South Wales include the Murray and the Murrumbidgee.

The coast of New South Wales has a moist climate, with mild winters and warm summers. The inland area is dry, with mild winters and hot summers.

People

Most people in New South Wales have British or other European ancestors. Other groups include Turks, Lebanese, Chinese, Vietnamese, Thais, and Indonesians. Australia's native people, called Aborigines, make up about 2 percent of the population.

More than 6 million people live in New South Wales. About 4 million live in Sydney, on the coast. Sydney is a major center of business and the arts. The magnificent Sydney Opera House, with its shell-like roofs, has become a symbol of Australia. Other important cities in New South Wales include Newcastle, Wollongong, Broken Hill, Wagga Wagga, and Lismore.

Economy

New South Wales produces more goods and services than any other state in Australia. Services, such as banking and



A rock formation called the Three Sisters rises above a cliff in the Blue Mountains, New South Wales.

Did You Know?

The Summer Olympics took place in Sydney, New South Wales, in 2000.

tourism, are the main parts of the economy. Farmers in the state mainly raise animals, especially sheep for wool. New South Wales also produces much of Australia's grain, including wheat, corn, and sorghum. In addition, most of the country's silver, lead, and zinc comes from mines in New South Wales.

History

The British explorer James Cook discovered New South Wales in 1770. He claimed the territory for King George III of Great Britain. The area reminded Cook of southern Wales in Great Britain, so he named it New South Wales.

The British government set up a colony at Sydney Harbour in 1788. Many of the people who lived there were prisoners sent from Great Britain. The colony grew slowly until gold was discovered in 1851. The gold rush that followed brought many people to the area.

When Australia became an independent country in 1901, New South Wales became a state of Australia. The current state borders were set up in 1915.

► More to explore

Australia • Canberra • Cook, James
• Sydney

Newspaper

Many people read newspapers for information on important events. Newspapers are usually published regularly, such as every day, week, or month. By the late 20th century Europe had more than 2,600 daily newspapers, and Asia had

more than 2,500. There were some 2,200 dailies in North America, more than 760 in South America, and nearly 160 in Africa.

The core of a newspaper is its stories about local, national, and international news. Many newspapers also contain columns in which people offer their own opinions and interpretations of events. Other articles may cover entertainment, business, travel, and sports. Most newspapers also have advertisements.

Producing a Newspaper

It takes many different people to publish a newspaper. Editors decide which stories should be written. Reporters research and write stories. Photographers take pictures. Businesspeople handle subscriptions and advertising. And many other people help write, design, print, distribute, and sell the newspaper.

Gathering enough information to fill a newspaper was often difficult and expensive until the creation of news services. News services collect information from around the world and sell it to



Newspapers are published in many countries and in many languages.



A newspaper rolls off the printing press. Other machines will cut and fold the pages.

many different newspapers. The Associated Press and Reuters are two well-known news services.

History

Before printing was invented, each copy of a text had to be written by hand. That process was costly and took a lot of time. In the mid-1400s Johannes Gutenberg invented a printing press that made it possible to print words on paper quickly. After that, newsletters and pamphlets were published in Europe. In the 1600s newspapers similar to today's appeared in Europe and Japan. The first regular newspaper in what is now the United States appeared in 1704.

In 1791 the First Amendment to the U.S. Constitution guaranteed freedom of the press in the United States. Some countries, however, still ban newspapers or prevent them from publishing stories that criticize the government.

The invention of computers in the 1900s greatly changed the newspaper business. Today writers can quickly send stories to publishers through e-mail. Editors and designers can easily change the content and look of articles using computers. And many people now read newspaper articles on the Internet, rather than in a printed copy.

► More to explore

Censorship • Communication • Internet
• Printing

Newton, Isaac

Isaac Newton was one of the great figures in the history of science. His ideas about motion and gravity are very important to the science of physics.

Isaac Newton was born on December 25, 1642, in Woolsthorpe, England. In 1661 he enrolled at Cambridge Univer-



An engraving shows Isaac Newton using a prism to separate sunlight into colors.

sity. There he became interested in new scientific ideas that were coming out of Europe. They included the idea that Earth and the other planets travel around the sun. This idea challenged the long-held belief that Earth was the center of the universe.

After Newton graduated from college, he continued to study and do experiments on his own. His first great discovery came from his experiments with light. He found that when white light passes through a prism, or triangular piece of glass, it breaks up into a band of colors. Newton concluded that white light is a mixture of colors.

Newton also wanted to know what keeps the Moon in its orbit, or path, around Earth. He thought that only an attraction, or pull, between Earth and the Moon could explain it. This pull is called gravity. Newton's work showed how gravity controls the motion of the planets around the sun as well as the motion of the Moon. As he studied gravity and motion, Newton also made important contributions to mathematics.

From 1669 to 1701 Newton was a professor at Cambridge. In 1703 he was elected president of a major scientific group called the Royal Society. In 1705 the queen of England made him a knight. Newton died in London, England, on March 20, 1727.

► More to explore

Gravity • Light • Mathematics • Motion
• Physics

New Year's Day



A crowd in New York City celebrates the arrival of a new year.

People around the world celebrate the start of a year on New Year's Day. In Europe, North America, and South America most people celebrate New Year's Day on January 1. In the United States many traditions surround New Year's Day. On the night before, called New Year's Eve, people stay up late and count down the seconds until midnight. Many people make New Year's resolutions, or promises to themselves. They see New Year's Day as a chance to make a fresh start.

People of other places and cultures observe the new year at times other than January 1. The Chinese New Year, for example, is celebrated for a month beginning in late January or early February. In Iran New Year's Day is in March, on the first day of spring. Followers of the Jewish religion celebrate the new year, called Rosh Hashana, in the fall.

► More to explore

Chinese New Year • Rosh Hashana

Did You Know?

Newton was buried in a London church called Westminster Abbey. Burial in Westminster Abbey is a high honor.

New York



The Adirondack Mountains cover the northern part of New York State.

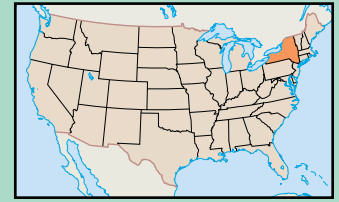
Few places in the United States rival New York State in terms of population, culture, and economic importance. Only the states of California and Texas have larger populations. New York City—with more than 8 million people—is the country's largest city. New York State's economic production is higher than that of most of the world's countries.

New York was one of the original 13 colonies. The colony was named after the English Duke of York. The nickname of the Empire State is thought to have come from a remark made by George Washington. In 1784 he referred to New York as the “seat of empire.” The capital of New York is Albany.

Geography

New York is located in the northeast section of the United States. From southwest to northeast, New York is bordered by Lake Erie, the Canadian

province of Ontario, Lake Ontario, and the Canadian province of Quebec. To the east are the states of Vermont, Massachusetts, and Connecticut. The Atlantic Ocean and New Jersey are to the southeast. Pennsylvania is to the south.



New York's largest natural region is the Appalachian Mountains, which cover about half of the state. The Appalachian region extends westward from the Hudson River valley to the state's southern and western boundaries.

A lowland region runs northward along the Hudson River to Albany and then westward along the Mohawk River. A raised, flat region lies north of the Appalachians and west of the Mohawk River valley. It extends along the southern shores of the Great Lakes. The state has several islands off the Atlantic coast. The largest ones are Manhattan,





Niagara Falls is a group of waterfalls on the Niagara River, which flows between New York State and Canada.

Staten Island, and Long Island. New York generally has warm summers and cold winters.

People

The population of New York is as varied as that of the United States itself. Members of every ethnic group entering the country passed through immigration stations such as Ellis Island, in New York Bay. Many remained in the state. Immigrants are still a major part of New York's culture—one fifth of the state's current population was born in a foreign country.

New Yorkers of European heritage account for about two thirds of the

state's population. New York's largest minority groups are African Americans and Hispanics—each group makes up more than 15 percent of the population. About 5 percent of New York's residents are of Asian heritage.

Economy

New York companies are involved in every type of economic activity. The state's economy and jobs are now dominated by service industries such as commercial trade, government, education, and tourism, however. New York City is the chief financial center of the country. It is home to the major U.S. stock exchanges and the headquarters of many major businesses.

The largest manufacturing industries in New York are chemicals, machinery, and food processing. Dairy farms account for more than half of New York's farm income.

History

Algonquian and Iroquois tribes lived in the New York region when Europeans arrived. The Algonquian tribes included the Mohican and the Munsee. The five Iroquois tribes were the Mohawk, the Oneida, the Onondaga, the Cayuga, and the Seneca.

The first European to visit the area was probably an Italian explorer, Giovanni da Verrazano, in 1524. In 1609 Henry Hudson sailed up what was later named the Hudson River and claimed the land for the Netherlands. The Dutch established the colony of New Netherland in 1624. The next year they founded the city of New Amsterdam. In 1664 the British took control of New Netherland and renamed it New York.

New York was a major battleground during the American Revolution (1775–83). One notable battle, at Saratoga, was considered the turning point of the war. New York became the 11th state in the Union when it approved the new U.S. Constitution on July 26, 1788.

The Erie Canal opened in 1825. The artificial waterway connects the Hudson River with Lake Erie. It was built to provide a way for ships to get from the Atlantic Ocean to the Great Lakes. This gave New York a link to the growing midwestern states. About half a million New Yorkers fought for the North during the American Civil War (1861–65). After the war new machinery and methods of producing goods quickly made the state a great manufacturing and trade center.

After World War II (1939–45) new highways, airports, and bridges made New York a center of transportation. In 1952 New York City became the headquarters of the United Nations, an organization dedicated to improving international relations. The city's international significance, however, made it a target of terrorism. On September 11, 2001, terrorists flew two hijacked planes into twin skyscrapers called the World Trade Center. The buildings were destroyed and almost 3,000 people were killed. The city and state worked hard to recover from the tragedy.

► More to explore

Albany • Iroquois • New York City

Facts About NEW YORK

Flag



Population

(2000 census)
18,976,457—
rank, 3rd state;
(2008 estimate)
19,490,297—
rank, 3rd state

Capital

Albany

Area

54,556 sq mi
(141,299 sq
km)—rank, 27th
state

Statehood

July 26, 1788

Motto

Excelsior (Ever
Upward)

State bird

Bluebird



State flower

Rose



Tall buildings surround Central Park in Manhattan, a part of New York City.

New York City



Population
(2000 census),
city, 8,008,278;
metropolitan
area,
9,314,235

New York City is the largest city in the United States. It is one of the world's great centers of culture and business. Its constant activity earned it the nickname "the city that never sleeps."

New York City is located in the state of New York. The city is made up of five districts called boroughs: Manhattan, Brooklyn, the Bronx, Queens, and Staten Island.

Places of Interest

New York City is packed with world-famous sites. The Statue of Liberty is located in its bay. The Empire State Building is the best-known skyscraper in



The Statue of Liberty stands on Liberty Island in New York Bay.

the Manhattan skyline. The huge Central Park lies near the heart of Manhattan.

The Lincoln Center for the Performing Arts is home to the city's world-class orchestra, ballet, and opera companies. The Broadway area is famous for its many theaters.

Economy

New York City's economy is based mainly on services. The Wall Street district is one of the world's major centers of finance and banking. The city is a leader in publishing, television, and fashion. Tourism, trade, advertising, and computer industries are also important.

History

New York City began in the 1620s as a Dutch trading post. The Dutch took control of Manhattan Island from the Algonquian Indians who lived there. The British took over the Dutch settlement in 1664.

New York City grew as a trade center. By 1790 it was the largest city in the newly created United States. In the 1800s and 1900s millions of immigrants entered the United States through Ellis Island, in New York Bay.

In recent times New York City was a target for terrorists. The worst attack came in September 2001, when hijackers crashed airplanes into the World Trade Center. Nearly 3,000 people were killed.

► More to explore

Ellis Island • Liberty, Statue of • New York • Skyscraper • Terrorism

New Zealand



New Zealand is a country made up of islands in the South Pacific Ocean. The Maori people lived on the islands for hundreds of years before Europeans arrived in the 1600s. New Zealand's capital is Wellington.

Geography

New Zealand lies about 1,000 miles (1,600 kilometers) southeast of Australia. It is the farthest south of all the countries in the region called Oceania. New Zealand's two main islands are called the North Island and the South Island.

Mountains cover much of the islands. On the South Island the Southern Alps contain the country's highest peak, Mount Cook, and many glaciers. New Zealand's longest river, the Waikato, is on the North Island. The islands have many harbors and fjords, or narrow arms of water with steep sides.

New Zealand has a mild climate with plenty of rain. It snows only in the mountains.

Plants and Animals

European settlers cut down many of the islands' original evergreen forests. In the 1900s New Zealanders began planting new forests of pine trees.

New Zealand's native animals include reptiles, frogs, and bats. The early Maori settlers brought dogs and rats. European

settlers brought red deer, opossums, and rabbits.

New Zealand has several types of flightless birds, including takahes, penguins, and kiwis. The kiwi bird is New Zealand's national symbol.

People

Most of the population has a European background. About 10 percent of New Zealanders have Maori ancestors. The country also has small groups of Asians and people from other Pacific islands. Both English and Maori are national languages. More than half of New Zealanders are Christians. Most New Zealanders live in cities and towns, mainly on the North Island.

Economy

Only a small portion of New Zealanders are farmers. Nevertheless, New Zealand's economy depends on agricul-





A cable car travels up the side of a mountain in Queenstown, New Zealand.

Facts About NEW ZEALAND



Population
(2008 estimate)
4,268,000

Area
104,454 sq mi
(270,534 sq km)

Capital
Wellington

**Form of
government**
Constitutional
monarchy

**Major urban
areas**
Auckland, Wel-
lington,
Christchurch,
Hamilton,
Dunedin

ture. Farmers raise many sheep and cattle. They grow apples, barley, wheat, and corn. Fishing and logging are also important to the economy. New Zealand sells wool, dairy products, meat, wood, paper, and fish to other countries.

Besides food and wood products, New Zealand's factories make cloth, machinery, and metal goods. Mines produce iron ore, gold, coal, limestone, and natural gas. Most New Zealanders work in services, including banking, insurance, and tourism.

History

The Maori came to New Zealand from islands in Polynesia, a region of the southeastern Pacific. They probably reached New Zealand by AD 800.

European Contact

In 1642 a Dutch sailor saw New Zealand but did not land. The British explorer James Cook arrived in 1769. European whale and seal hunters soon came to the islands.

In 1840 the Maori accepted rule by Great Britain. The British promised to protect the Maori's rights to their land. However, European settlers soon demanded that the Maori sell their land. The British and the Maori fought wars until the 1870s. The Maori lost most of their best land.

In 1907 New Zealand became a separate state within the British Empire. In 1947 New Zealand gained full independence from Britain. New Zealand stayed a member of the Commonwealth of Nations, a group of countries with friendly ties to Britain.

Modern New Zealand

In the late 20th and early 21st centuries New Zealand increased its trade with Australia, other Pacific countries, and the United States. The government also began to give some land back to the Maori.

► More to explore

Maori • Oceania • Wellington



A Maori village in Rotorua, New Zealand, includes buildings with complex wood carvings. Maori artists are famous for their fine, traditional carvings.

Nez Percé



Chief Joseph was a great leader of the Nez Percé in the 1800s.

The Nez Percé are a Native American people who traditionally lived along the Snake River. The area where they lived is now Idaho, Oregon, and Washington.

The tribe's main source of food was salmon. The Nez Percé also gathered roots and berries and hunted deer and rabbits. Early in the 1700s they got horses and began to hunt bison (buffalo). In winter the Nez Percé lived in large, wood-framed lodges. On summer hunting trips they built tentlike houses.

The Nez Percé knew only other Native Americans until 1805. In that year the U.S. explorers Meriwether Lewis and William Clark entered Nez Percé lands. By the 1840s many white settlers were traveling through the territory.

Conflicts between some Nez Percé and the settlers led to the Nez Percé War of

1877. The Nez Percé were defeated. Some of them were sent to Oklahoma and later to a reservation in Washington state. Most of the other Nez Percé remained on a reservation in Idaho. In the late 20th century there were about 4,000 Nez Percé living in the United States.

► More to explore

Native Americans

Niamey



Population
(2007
estimate), urban
area, 915,000

Niamey is the capital of Niger, a country in western Africa. The city lies on the Niger River. It is the largest city in the country. Niamey is located at a point where trade routes cross.

Trade and other service industries are important to Niamey's economy. Many of Niger's factories are located in the city.

Niamey began as a small fishing village of the Zarma and Fulani peoples. In 1926 the French made it the capital of their colony of Niger. In 1960 Niger became an independent country with Niamey as its capital.

► More to explore

Niger



Nicaragua

The largest country in Central America is Nicaragua. Its capital is Managua.

Geography

Nicaragua is next to Honduras and Costa Rica. The Caribbean Sea is on the east, and the Pacific Ocean is on the west. The eastern part of the country is a swampy area called the Mosquito Coast. Mountains rise in central Nicaragua. The west has volcanoes and Lakes Nicaragua and Managua. The climate is generally warm. Earthquakes and hurricanes are common.

Plants and Animals

Nicaragua has tropical forests with cedar, mahogany, and other trees. Wild animals include pumas, jaguars, monkeys, anteaters, snakes, and tropical birds.

People

Most of Nicaragua's people have mixed European (mostly Spanish) and American Indian ancestors. Whites and blacks

make up about a quarter of the population. Most of the people are Roman Catholics. Spanish is the main language.

Economy

Nicaragua is a poor country. Many people work in agriculture, forestry, or fishing. Nicaragua sells coffee and sugar to other countries. Other crops include bananas, cotton, rice, corn, and beans. Factories produce chemicals, machinery, clothing, and petroleum products. Mines provide gold, copper, and silver.

History

Indians have lived in what is now Nicaragua for thousands of years. The Spanish established settlements there in the early 1500s. Many of the Indians died from European diseases. The Spanish sold others into slavery.

In 1821 Nicaragua became independent from Spain. It first joined the new Mexican Empire and then a union of Central American states. Nicaragua became a separate republic in 1838.

Many of Nicaragua's presidents were dictators, or rulers with unlimited power. In 1979 a rebel group called the Sandinistas took over the government. A group called the *contras* fought the Sandinistas. The Sandinistas lost power in a free election in 1990.

► More to explore

Central America • Managua

Facts About NICARAGUA



Population
(2008 estimate)
5,667,000

Area
50,337 sq mi
(130,373 sq km)

Capital
Managua

Form of government
Republic

Major cities
Managua, León,
Chinandega,
Masaya,
Granada, Estelí



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Nicholas II

The last tsar, or emperor, of Russia was Nicholas II. His reign came to an end in 1917 when revolutionaries took over the government. Soon afterward, Russia became the Soviet Union, a Communist country. (Communism is a political system in which the people share all property.)

Early Life

Nicholas II was born on May 18, 1868, at Tsarskoye Selo in Russia. His family name was Romanov. Tutors educated Nicholas. In 1894 he became tsar. Soon afterward he married a German princess named Alexandra.

Reign

As tsar, Nicholas did not understand that the common people wanted to have

a say in the government. After a rebellion in 1905, he agreed to create a house of representatives called the Duma. But Nicholas did not allow the Duma to have much power. The people became even more angry.

Nicholas did not get along with other countries either. His greatest conflict was with Japan. The result was the Russo-Japanese War (1904–05), which Russia lost.

In 1914 Russia entered World War I. While Nicholas led the army, he paid little attention to the running of government. Instead power passed to Alexandra. She was greatly influenced by a monk named Rasputin. However, he made bad decisions, and many good government officials were dismissed. Finally, in 1917 the angry Russians began the Russian Revolution.

Russian Revolution

Riots broke out in Petrograd (now Saint Petersburg) on March 8, 1917. Nicholas sent soldiers there, but it was too late. The Duma, supported by the army, forced the tsar to step down. The new leaders of Russia took Nicholas, Alexandra, and their five children prisoner.

Soon afterward, a group of Communists, called Bolsheviks, took over the government. The Bolsheviks killed Nicholas and his family on July 17, 1918.

► More to explore

Russia • Russian Revolution • Tsar

Did You Know?

Under the rule of Nicholas II, the Trans-Siberian Railroad was finished. It runs more than 5,700 miles (9,100 km) across Russia.



Nicholas II and his wife had five children. Communists killed the entire family because they did not want anyone ever to claim to be the emperor or empress of Russia.

Nicosia



Population

(2005 estimate), Greek Nicosia, urban area, 219,200; (1996 census), Turkish Nicosia, 39,176

Nicosia is an ancient city that has had many rulers. Today it is the capital of Cyprus, an island country in the Mediterranean Sea. Cyprus is divided into two sections. The island's Greek residents control the southern section. Their government is the official government of the island. Turkish residents control the northern section. Only Turkey considers the Turkish section to be a separate country. Nicosia is the capital of both parts of Cyprus. Part of the city lies within the Greek section, and part lies

within the Turkish section. The Greek name for the city is Lefkosía. The Turkish name is Lefkosa.

Tourism and other service industries are important to Nicosia's economy. Factories in the city make such products as cloth, clothing, and processed foods.

Nicosia was part of the Byzantine Empire from 330 to 1191. During that period the city became the capital of Cyprus. The Ottoman Turks ruled Cyprus from the late 1500s to the late 1800s. Great Britain took control in 1878.

In 1960 Cyprus became an independent country with Nicosia as its capital. A few years later groups of Greeks and Turks began fighting in the city. The Greeks left the Turkish parts of Nicosia, and the Turks left the Greek areas.

► More to explore

Cyprus



A mosque stands in the Turkish section of Nicosia.

Niger

Niger is a large country in West Africa. It covers parts of the Sahara Desert and the dry Sahel region to the south. The capital is Niamey.

Niger borders Algeria, Libya, Chad, Nigeria, Benin, Burkina Faso, and Mali. The land in the north is a high desert. Most rivers in Niger flow only during the short rainy season. Niger is one of the hottest countries in the world.

Northern Niger has few plants. Grasses, palms, and acacia and baobab trees grow in the south. Animals in the south include elephants, giraffes, gazelles, hyenas, and lions.

Niger's many peoples include the Hausa and the Songhai, who are mainly farmers. The Fulani and the Tuareg peoples are mainly herders who move from place to place. The national language is French, but most people speak an African language. Islam is the main religion.



Some of the people in Niger live in villages of small round houses.

Niger is a poor country. Most people work in agriculture. Farmers grow cow-peas, cotton, sugarcane, peanuts, onions, and grains. Herders raise goats, sheep, cattle, and camels. Niger's main industry is uranium mining.

In early times the Songhai and Kanem-Bornu controlled southern Niger. The Hausa and the Fulani later ruled. The Tuareg controlled the north. Europeans explored the region in the 1800s. France made Niger a colony in 1922.

Niger won independence in 1960. Since then the military has taken over the government several times. Niger held its first democratic elections in 1993.

► More to explore

Kanem-Bornu Empire • Niamey
• Sahara • Songhai Empire



Facts About NIGER



Population
(2008 estimate)
14,731,000

Area
459,286 sq mi
(1,189,546 sq km)

Capital
Niamey

Form of government
Republic

Major cities
Niamey, Zinder,
Maradi, Agadez,
Tahoua



Nigeria

More people live in Nigeria than in any other African country. Its land is rich in oil and natural gas. Abuja is the capital.

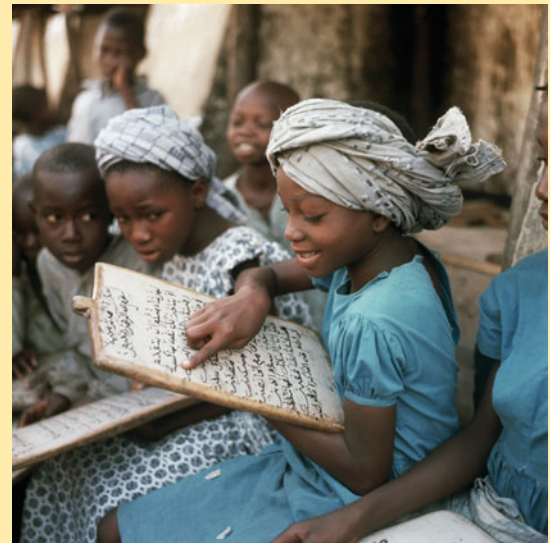
Geography

Nigeria lies in West Africa. It borders Benin, Niger, Chad, and Cameroon. The Atlantic Ocean lies to the south.

Nigeria has plains in the north and south. In the center there are hills and plateaus, or high, flat lands. Nigeria has two major rivers, the Niger and the Benue. Lake Chad lies across the country's northeastern border. Nigeria is warm with rainy and dry seasons.

Plants and Animals

Swamps and mangrove trees line Nigeria's coast. Tropical rain forests grow in the southwest. In the center of the country are woodlands and open grasslands. Grasses and scattered trees grow in the dry north.



A student in Ibadan, Nigeria, reads the Koran (the holy book of Islam).

Many antelope, giraffes, hyenas, lions, leopards, and elephants once lived in Nigeria. There were also many monkeys, gorillas, and chimpanzees. Most of these animals now live mainly in national parks. Nigeria's other wild animals include snakes, crocodiles, and hippopotamuses. Ostriches, storks, parrots, and toucans also live in the country.

People

There are about 250 ethnic groups in Nigeria. Each has its own customs and language. The four largest groups are the Hausa, the Yoruba, the Igbo, and the Fulani. More people speak Hausa than any other language. English is the language of the government.

About half of the population is Muslim, and nearly half is Christian. More than half of the people live in rural areas.

Economy

Nigeria is the largest producer of oil in Africa. The country also has deposits of natural gas, coal, and tin. Nigeria's factories make food products, cloth, cement, chemicals, and other goods.

Many Nigerians are farmers. They raise goats, sheep, cattle, and pigs for meat. They also grow sorghum, yams, millet, cassava, corn, peanuts, rice, and other crops. Nigeria sells cocoa beans and natural rubber to other countries. Fishing and logging are also important.

History

People have lived in the Nigeria region for thousands of years. The Nok people lived on the central plateau about 2,000 years ago. Later the Yoruba settled in the west, the Hausa and Fulani in the north, and the Igbo in the southeast. Many kingdoms rose and fell.

The Portuguese reached the Nigerian coast in 1472. By the 1600s British slave ships had arrived. The slave traders captured millions of Nigerians and sent them to the Americas. The British made the slave trade illegal in 1807.

By about 1900 the British controlled most of the region. In 1914 they created a single colony out of what had been many independent states. Nigeria gained independence in 1960.

Groups in Nigeria fought for power. The military took over the government in 1966. A civil war broke out in 1967 and lasted until 1970. Military groups controlled Nigeria until 1999. In that year Nigeria held democratic elections. However, violence and protests continued into the 21st century.

► More to explore

Abuja • Petroleum



Fishers cast a net on the Niger River in Nigeria. In the distance is an oil refinery, or a factory for processing oil.

Facts About NIGERIA



Population
(2008 estimate)
146,255,000

Area
356,669 sq mi
(923,768 sq km)

Capital
Abuja

Form of government
Republic

Major cities
Lagos, Kano,
Ibadan, Kaduna,
Benin City, Port
Harcourt

Nightingale



A nightingale perches on the end of a branch.

The nightingale is a small, plain-looking bird with a big voice. Many people think its highly varied, musical songs are beautiful. Sometimes people call other birds with musical songs nightingales. But most often the name refers to the Eurasian nightingale. This songbird is in the same family as thrushes, robins, and bluebirds.

Nightingales live in the woodlands. They prefer low bushes to tall trees. These birds nest throughout much of Europe and western Asia. They fly to warmer central Africa for the winter.

The nightingale is about 6.5 inches (17 centimeters) long. It has a brown body, a reddish tail, and a cream-colored belly and chest. Nightingales use their slender bills to eat insects and worms that they find on the ground.

The nightingale's song is most often heard during spring and early summer. This period is the mating and nesting

season. At this time the male may sing at any hour. The female builds a cup-shaped nest out of dry leaves, twigs, and grass. She lays four to six eggs, which hatch in about two weeks.

► More to explore

Bird • Bluebird • Robin • Songbird

Nightingale, Florence

Florence Nightingale was a pioneer in the field of nursing. She improved the care of sick and wounded soldiers. She also made nursing a respectable career for women.

Early Life

Florence Nightingale was born in Florence, Italy, on May 12, 1820. She grew up in Great Britain, where she had a comfortable life with her wealthy par-



Florence Nightingale

ents. She studied several languages, history, and mathematics with her father at home.

Nightingale began studying nursing in 1850. At that time nursing was not a respected profession. Nevertheless, Nightingale felt called to be a nurse.

Career

In 1854 the Crimean War broke out between the Russians and the Turks, the French, and the British. Nightingale traveled to Turkey to care for the sick and wounded British soldiers. She found horrid conditions in the military hospital in Turkey. Medical supplies were low. The hospital was dirty and filled with rats and fleas. In fact, more patients were dying from fever and infection than from battle wounds.

Nightingale took control and was soon running the hospital. Her nursing duties often kept her up all night. The soldiers named her the Lady with the Lamp. At one point she nearly died from a fever. After the war the British people thought of Nightingale as a heroine.

In 1857 Nightingale became sickly. She spent most of the rest of her life at home, but she continued to work. In 1860 she formed the Nightingale School for Nurses. It was the first school in the world that trained women to be professional nurses. Nightingale died in London on August 13, 1910.

► More to explore

Nursing

Nightshade



Some kinds of nightshade have poisonous leaves and berries.

Nightshade grows as a weedlike plant, a shrub, or a vine. Many of the more than 2,300 species, or kinds, of nightshade are poisonous. Two of the best-known kinds are common nightshade and bittersweet nightshade. Nightshades belong to a group of plants called the nightshade family, which also includes tomatoes and potatoes.

Nightshade plants grow naturally in woody, damp areas of North America, Europe, and Asia. Farmers grow deadly nightshade, also called belladonna, in Europe, India, and the United States. It is used in medicine.

Nightshades can grow from about 12 inches (30 centimeters) to 5 feet (1.5 meters) tall. Vines can reach up to 10 feet (3 meters) in length. The leaves in all species grow in pairs on opposite

sides of the stem. Flower colors can be white, blue, or deep purple. When the flowers die, berries appear. Depending on the species, the berries are yellow, red, or black.

Deadly nightshade contains substances called alkaloids, which have several medical uses. Eye doctors use an alkaloid to help them view the inside of the eye. Alkaloids also can be used to make sleeping pills and pain medications.

► More to explore

Plant • Potato • Tomato

Nile River



The Nile is the longest river in the world. It flows through northeastern Africa for about 4,132 miles (6,650 kilometers). The great civilization of ancient Egypt developed on its banks.



Sailing ships called feluccas travel on the Nile River near Luxor, Egypt.

The most distant sources of the Nile are rivers that begin in Burundi and Rwanda. Those rivers flow into Lake Victoria. From Lake Victoria the Nile flows through Uganda and Sudan. For about 500 miles (800 kilometers) in Sudan the river is called the White Nile.

At the city of Khartoum, Sudan, the White Nile is joined by the Blue Nile. Farther north it is joined by the Atbara River. Both the Blue Nile and the Atbara begin in the highlands of Ethiopia. The Nile continues to flow north across the deserts of Sudan and Egypt. North of Cairo, Egypt, the Nile enters the region called the delta. There it splits into two branches that flow into the Mediterranean Sea.

Plants and Animals

Tropical rain forests grow along the southern Nile. They include banana, ebony, rubber, and bamboo trees. Savanna grasslands run along the Blue Nile. The desert north of Khartoum has few plants.

Fish found in the Nile include Nile perch, catfish, eels, lungfish, mudfish,

and tiger fish. Nile perch can grow to 300 pounds (140 kilograms). Nile crocodiles, soft-shelled turtles, and snakes are common reptiles.

Economy

Ancient Egyptians who lived along the Nile were among the first people to take up farming. They used the river to water their crops through methods called irrigation. Crops now grown along the Nile include beans, corn, cotton, millet, rice, wheat, and sugarcane.

Today dams hold back Nile floodwaters for irrigation. They also produce electricity. The most important dam is the Aswan High Dam in Egypt. The Nile is also a main waterway for moving people and goods.

► More to explore

Delta • Egypt, Ancient • Irrigation

Nipmuc

The Nipmuc were a group of related Native American peoples of New

England. They traditionally lived on the land that is now Massachusetts, Rhode Island, and Connecticut. They lived mostly along rivers or near lakes. The name Nipmuc means “freshwater fishing place.”

The Nipmuc built homes by covering pole frames with bark or woven mats. They grew corn, beans, and squash. They hunted moose, deer, black bears, rabbits, and squirrels. The Nipmuc also fished and gathered wild roots, berries, and nuts.

In the 1630s English colonists began to settle in Nipmuc territory. By 1674 some Nipmuc had moved to villages set up by the English. However, most of the Nipmuc wanted to drive the English from their lands. In 1675 they joined a Native American force in a war against the colonists. The leader of the Native Americans was the Wampanoag chief Metacom, who was also known as King Philip. King Philip’s War was the bloodiest conflict in New England in the 1600s. The Native Americans lost the war.

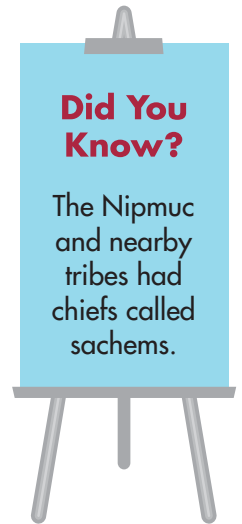
Some of the surviving Nipmuc fled their lands. Some joined the Mohican and other tribes living along the Hudson River. Others fled to Canada. At the end of the 20th century there were about 600 Nipmuc. They lived in Massachusetts and Connecticut.

► More to explore

King Philip’s War • Mohican • Native Americans

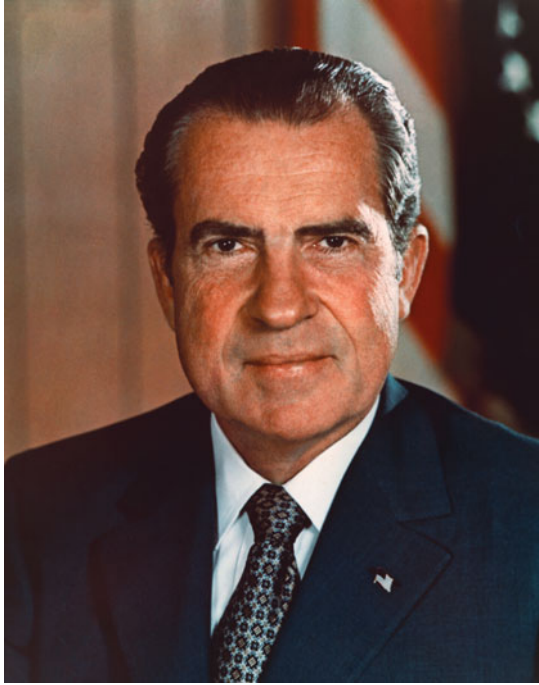
Did You Know?

The Nipmuc and nearby tribes had chiefs called sachems.



A museum display in Connecticut shows what a Nipmuc village looked like.

Nixon, Richard M.



Richard M. Nixon was the 37th president of the United States.

Richard M. Nixon was the 37th president of the United States. He was the first president to resign from office. He was forced to step down in 1974 because of his involvement in the political scandal known as Watergate.

Early Life

Richard Milhous Nixon was born on January 9, 1913, in Yorba Linda, California. His father, Frank Nixon, was a service station owner and grocer. His mother, Hannah Milhous, was a Quaker. Nixon won a scholarship to Duke University Law School in Durham, North Carolina. After graduating in 1937, he returned to California to practice law.

Nixon married Thelma Catherine Patricia Ryan, known as Pat, in 1940. They had two children. Nixon joined the U.S. Navy in 1942 and served in World War II.

Political Career

After the war Nixon was elected to the U.S. House of Representatives as a Republican. In 1950 Nixon won a seat in the U.S. Senate. Two years later the Republicans chose him to run for vice president under Dwight D. Eisenhower. Eisenhower and Nixon won the elections of 1952 and 1956.

In 1960 Nixon ran for president but lost the election to John F. Kennedy. Two years later he ran for governor of California. Again he lost.

Presidency

In 1968 the Republicans again chose Nixon to run for the presidency. Nixon narrowly defeated the Democratic candidate, Hubert H. Humphrey.

President Nixon turned his attention to foreign affairs, especially the Vietnam War. In 1969 Nixon began to take U.S. troops out of Vietnam. However, he also bombed North Vietnam and expanded the war into neighboring Cambodia and Laos.

In 1972 Nixon visited China. It was an important trip because the governments of the United States and China had not met for 21 years. Later that year he visited the Soviet Union and signed a number of treaties that limited nuclear weapons.



TIMELINE

Nixon is born in Yorba Linda, California.

January 9, 1913

Nixon becomes vice president under Dwight D. Eisenhower.

1953

The Senate starts investigating Watergate.

1973

Nixon dies in New York City.

April 22, 1994

Nixon wins a seat in Congress.

1946

Nixon is elected president.

1968

Nixon resigns.

1974

Nixon easily won reelection in 1972. In January 1973 the United States and North Vietnam agreed to stop fighting. However, the political scandal called Watergate soon overshadowed that success.

Watergate

In 1972 Republicans hired five men to spy on the Democrats. That June police arrested the men for breaking into the Democratic national headquarters, located in the Watergate building in Washington, D.C. After the arrests Nixon secretly ordered his staff to cover up the Republicans' role in the crime.

In 1973 the Senate began investigating the Watergate affair. In 1974 documents proved that Nixon had ordered the cover-up. The House of Representatives planned to impeach Nixon, or charge him with crimes. Before he could be impeached, Nixon resigned on August 8, 1974.

Vice President Gerald R. Ford replaced Nixon as president. Ford pardoned Nixon for any crimes he might have committed during his presidency.

Retirement

Nixon retired to California. He wrote several books. Nixon died in New York City on April 22, 1994.

► More to explore

Eisenhower, Dwight D. • Ford, Gerald R. • Kennedy, John F. • United States • Vietnam War

Nobel Prize

The Nobel prize is one of the most important awards that anyone can receive. Nobel prizes are given each year in six subject areas. The areas are physics, chemistry, medicine, literature, peace, and economics. The prizes honor people anywhere in the world who have done outstanding work in one of these areas.



Wangari Maathai of Kenya was awarded the Nobel peace prize in 2004. She was the first black African woman to receive a Nobel prize.

The Nobel prizes are named after Alfred Nobel, a Swedish scientist. He invented the explosive called dynamite. The invention made him rich. He decided to use the money to honor people who helped humankind in some way.

The first Nobel prizes were handed out on December 10, 1901, exactly five years after Alfred Nobel's death. At first there were only five prizes. The prize for economics was added to the list in 1969. Groups in Sweden decide who wins most prizes. A group in Norway picks the winner of the peace prize.

The winners receive their awards at a banquet in Stockholm, Sweden. Each winner takes home a gold medal and a certain amount of money. Sometimes two or three people share a prize. Only the peace prize can be won by an organization, however.

Nomad

A nomad is a person who moves from place to place. Long ago, before the development of farming and cities, many people were nomads. They moved from one area to another in search of food for themselves or for their animals. The number of nomads has decreased over the years. However, some people still have a nomadic lifestyle.

There are three general types of nomads: hunters and gatherers, pastoral nomads (animal herders), and craftsmen-handymen-traders. Hunter and gatherer nomads move around in search of animals to hunt and wild plant foods to gather. Many Native Americans were hunter and gatherer nomads before Europeans arrived in their lands. Today some of the San (Bushmen) of southern Africa are hunters and gatherers.

Pastoral nomads travel to find land where their animals can graze. Some peoples of central Asia, Siberia, the Arabian Peninsula, and northern Africa are pastoral nomads. The Kazakh people of central Asia herd horses, sheep, cattle,



Nomads collect water from a well in Somalia.

goats, and camels. Some Kazakhs travel hundreds of miles from winter homes in the south to summer pastures in the north. They live in tents called yurts. The Bedouins are pastoral nomads of the Arabian Peninsula.

Craftsmen-handymen-trader nomads travel around selling goods or providing services. For example, nomads in India and Pakistan go from town to town selling handmade baskets and other goods. The Roma (Gypsies) are other nomads of this type. Today, though, many Roma live settled lives.

► More to explore

Native Americans • Rom

Nootka

The Native Americans known as the Nootka live on the west coast of Van-



A photograph from about 1910 shows a Nootka holding a spear.

couver Island. The island is part of British Columbia, a province of Canada. In the past some Nootka lived in the northwestern part of the U.S. state of Washington. The Nootka call themselves Nuu-chah-nulth, which means “all along the mountains.” The name refers to the mountains of Vancouver Island.

The Nootka traditionally got much of their food from the sea. They hunted whales, seals, and sea otters. They also fished and collected wild roots and berries. During the warmer months the Nootka got enough food to last all year. In winter they moved to camps away from the sea, where they ate dried fish.

The Nootka held feasts called potlatches. The family hosting a potlatch gave gifts to their guests. The gift giving increased their status within the tribe.

European explorers and traders visited Nootka lands beginning in 1774. The Nootka generally welcomed the visitors. They gave the Europeans furs in exchange for goods such as metal pots and tools. However, the traders also brought diseases that killed many Nootka.

As the Nootka population decreased, white settlers took control of their land. In 1871 the Canadian government set aside a small piece of land for the Nootka. In the early 21st century there were about 6,000 Nootka in Canada.

► More to explore

Native Americans

Did You Know?

Nootka religious leaders held ceremonies to lure dying whales to their shores.

Norman Conquest



A page from a book from the 1300s shows William the Conqueror on horseback.

The Norman Conquest was an important event in English history. It happened in 1066, when the ruler of Normandy—an area in northern France—conquered England. This ruler is now known as William the Conqueror. No enemy since has invaded England successfully. The Conquest led to many changes in England.

Background

William became the duke, or ruler, of Normandy in 1035. He was the cousin of the king of England, Edward the Confessor. Edward's people were the Anglo-Saxons. When Edward died in January 1066, William thought he should become king. However, an Anglo-Saxon named Harold crowned himself king.

Conquest

William decided to fight Harold for the crown. He gathered about 5,000 knights on the coast of Normandy, directly across the English Channel from England. His army landed in England on September 28.

The Norman and Anglo-Saxon armies battled near the town of Hastings on October 14. Harold's men were no match for William's knights on horseback. An arrow killed Harold, and the remaining Anglo-Saxon forces scattered and fled.

William then advanced to London, the capital. He was crowned king on Christmas Day in 1066. Some parts of the country resisted him until 1071.

How England Changed

William rewarded many of his knights by making them England's new nobles. They built castles and gave land to their own followers. They replaced the Anglo-Saxons who had controlled the land. However, William did not overturn the English system of laws and courts.

The Conquest also changed the English language. People used mainly Latin and Norman French for writing for about 200 years afterward. In the 1200s English came back as a written language. By then it had many new words that were borrowed from Latin and French.

► **More to explore**
Anglo-Saxon • England

North America

Canada, the United States, and Mexico make up the largest part of the continent of North America. The countries of Central America also are part of the continent, and several islands, including the West Indies and Greenland, are associated with North America. It is third in size and fourth in population among Earth's continents.

Land and Climate

Belts of mountains run along the east and west sides of North America. In the east are the Laurentians and the Appalachians. The mountains in the west are much taller. They include the Rocky Mountains, which extend from Canada to Mexico. Mexico has the Sierra Madre Occidental in the west and the Sierra Madre Oriental in the east.



Forests of both evergreens and hardwood trees cover the slopes of the Adirondack Mountains, in the U.S. state of New York.

Between the Appalachians and the Atlantic Ocean in the east is a low coastal plain. Another vast lowland stretches from the Rocky Mountains to the Appalachians. Between Mexico's eastern and western mountain systems lies a high central plateau.

The Great Lakes, in east-central North America, make up the largest area of freshwater in the world. Most of the continent's other large lakes are farther north, in Canada. North America's largest river system is the Mississippi. On its way to the Gulf of Mexico, the Mississippi picks up the waters of the Missouri and the Ohio. Together these rivers drain the central United States.

Most of North America has a mild climate, with warm summers, cold winters, and moderate rainfall. However, much of Alaska and northern Canada have bitterly cold winters and short, cool



The Rio Grande flows through the desert in Big Bend National Park, in the U.S. state of Texas. The river forms the border between Texas and Mexico. In Mexico it is known as the Río Bravo del Norte.



summers. Parts of the southwestern United States and northwestern Mexico are very dry, with regions of desert and semidesert. Central America has hot weather and heavy rainfall throughout the year.

Plants and Animals

The mountainous parts of North America contain large areas of thick forests. Douglas fir, redwood, pine, and spruce trees grow along the northern Pacific Coast. Tropical hardwood forests grow in Mexico and Central America. Few plants grow in the desert and cold northern regions. Prairies form a belt between forest and desert, mainly on the Great Plains of the central part of the continent.

Animals native to North America include bighorn sheep, mountain goats, moose, and elk. There are also mountain lions (pumas), bobcats, lynx, coyotes, wolves, and bears. Deer thrive in many areas, while squirrels, rabbits, and raccoons have adapted to areas inhabited by humans. Alligators, snakes, wild pigs, colorful birds, and monkeys live in the warmer southern regions.

Human activity has greatly affected the plants and animals. By the mid-1900s the United States had killed much of its wildlife, cut more than half its timber, and plowed up nearly all its grassland. Much of this was done to clear the land for cities to develop. In the second half of the 1900s the countries of North America began to protect some of their land and animals.

People

The original inhabitants of North America were Native Americans. In Mexico and parts of Central America, more than 80 percent of the people have at least some American Indian ancestors. Most of the people in the United States and Canada are of European descent. In the United States an important minority of the people have ancestors from Africa who were brought over as slaves.

In the United States and most of Canada the main language is English. French is spoken in parts of eastern Canada, particularly Quebec. Spanish is the main language in Mexico and Central America and is also spoken by many people in the United States.

Most of the continent's people are Christian. Canada has more Roman Catholics than Protestants, and nearly all Mexicans are Roman Catholic. In the United States all major religions are rep-



Skyscrapers in Toronto line the shores of Lake Ontario, one of the five Great Lakes. Toronto is the capital of the province of Ontario, Canada. It is also Canada's largest metropolitan area.

resented, though more than half the people follow Protestant faiths. The United States and Canada have Jewish and Muslim minorities.

Overall, the people in Canada and the United States enjoy a good quality of life. Nearly everyone there can read and write. Hospital facilities are second to none. However, there is also some poverty. A wide gap exists between those who are well off and those who have less. In Mexico and Central America poverty is more common. Fewer people are wealthy, and health and educational facilities are less available.

Economy

In the United States and Canada the economy has long depended more on manufacturing than on farming. Manufacturing began to grow quickly in Mexico as well in the late 1900s. Chemicals, food products, electronics, transportation equipment, and other machinery are North America's leading products. Industries that serve the public, such as banking, health care, communications, and tourism, became the most significant part of the continent's economy in the late 1900s. In Central America farming is most important.

North America produces much of the world's food. Wheat, corn, soybeans, hay, fruits and vegetables, and dairy products are produced in various regions of the United States and Canada. In Mexico sugarcane, corn, sorghum, bananas, and other tropical fruits and vegetables are grown.



Piles of harvested corn are set out to dry in the fields of a farming region in central Mexico. In the distance is the snowcapped peak of the volcano Iztaccíhuatl.

North America is also rich in natural resources, including minerals such as iron ore, copper, nickel, zinc, lead, and silver. The United States has large deposits of coal. Oil is found in the south-central United States and Alaska, western Canada, and eastern Mexico.

History

North America's first human inhabitants came over from Asia some 20,000 to 35,000 years ago. The people who became the Native Americans came first and eventually moved south. The Inuit came later and remained in the north.

As early as 3500 BC, settlers began establishing farming. The Olmec in what is now Mexico were the first to build a civilization, beginning in about 1200 BC. They built trading villages and developed a system of writing. The

Facts About NORTH AMERICA

Area

9,418,467 sq mi (24,393,717 sq km)

Population

(2008 estimate) 526,827,700

Largest Country by Area

Canada: 3,855,103 sq mi (9,984,670 sq km)

Smallest Country by Area

Saint Kitts and Nevis: 104 sq mi (270 sq km)

Largest Country by Population

United States: (2008 estimate) 305,146,000

Smallest Country by Population

Saint Kitts and Nevis: (2008 estimate) 51,300

Largest Cities

Mexico City, Mexico; New York, New York; Los Angeles, California; Chicago, Illinois; Havana, Cuba; Houston, Texas

Longest River

Mississippi-Missouri River, U.S.: 3,710 mi (5,971 km)

Largest Lake

Lake Superior, U.S./Canada: 31,700 sq mi (82,100 sq km)

Maya and Aztec later built other cities, pyramids, and monuments.

A Viking named Leif Eriksson was probably the first European to visit North America. He landed in what is now Canada in about AD 1000. However, the Vikings did not make any permanent settlements. In the late 1400s Europeans began exploring the continent, and they soon established colonies. In general, Spain took control of the southern area (present-day Mexico and Central America), France settled in the north

(present-day Canada), and England took the middle (present-day United States). The English took over much of the north in the 1760s.

The United States was formed in 1776, when the 13 British colonies declared their independence. Mexico became independent from Spain in 1821. Canada formed a separate government within the British Empire in 1867 and became officially self-governing in 1931. Gradually, nearly all the colonies of Central America and the West Indies also gained independence.

The United States and Canada developed rapidly in the last half of the 1800s. But this came at a heavy cost to Native Americans. Most of the peoples who had survived fighting and diseases brought by Europeans lost their homelands. They were left only with confined areas called reservations in the United States and reserves in Canada.

Mexico remained more in touch with its Amerindian heritage, but it was less developed economically. The United States attracted many emigrants from Mexico. In 1992 Canada, the United States, and Mexico signed the North American Free Trade Agreement. The agreement was meant to promote trade between the three countries.

► More to explore

Aztec • Canada • Central America
• Eskimo • Great Lakes • Maya
• Mexico • Native Americans • Olmec
• Rocky Mountains • United States

North Atlantic Treaty Organization

The members of the North Atlantic Treaty Organization (NATO) are countries in Europe and North America. All have made a promise to help defend each other if any of them is attacked. NATO was founded in 1949 because of threats from the Soviet Union. Now it deals with other issues. Its headquarters are in Brussels, Belgium.

Formation

After World War II (1939–45) the Communist government of the Soviet Union set up other Communist governments in several countries of eastern Europe. The countries of western Europe had democratic governments. They feared that the Soviets would spread Communism even farther. The



NATO does other things besides defending its member countries. The organization sent soldiers and supplies to Pakistan after an earthquake in 2005.

United States and other democratic countries shared their concern. This tension between the Soviet Union and its democratic rivals became known as the Cold War.

To protect each other against the Soviets, 12 countries formed NATO in 1949. The original NATO members were Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, The Netherlands, Norway, Portugal, the United Kingdom, and the United States. More countries joined later.

In 1955 the Soviet Union and its Communist allies formed a group similar to NATO. It was called the Warsaw Pact.

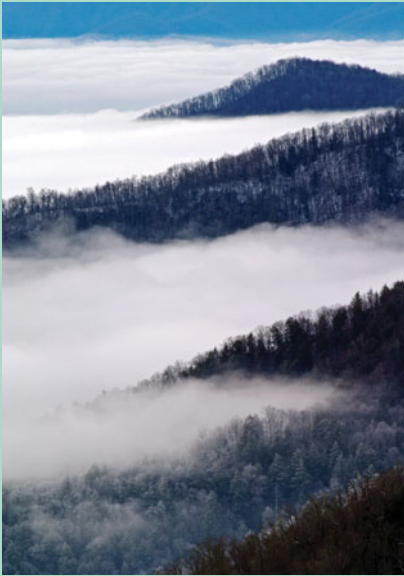
After the Cold War

In the early 1990s the Soviet Union broke up and the Warsaw Pact ended. The Cold War was over. Hungary, Poland, and the Czech Republic—all former members of the Warsaw Pact—joined NATO in 1999. Seven more countries that had been Communist joined NATO in 2004.

In 1995 NATO first used military force. Its warplanes bombed Serbian troops in the Balkans region of southeastern Europe. These troops were threatening other ethnic groups. In September 2001 terrorists attacked the United States. This marked the first time that NATO was called upon to defend one of its members. It supported U.S. efforts to end terrorism.

► **More to explore**
Cold War

North Carolina



Misty clouds pass over the Great Smoky Mountains in North Carolina.

One of the original 13 states of the United States, North Carolina is rich with history. In 1587 it was the birthplace of Virginia Dare, the first child born of English parents in America. Almost 200 years later, in 1775, the colony of North Carolina became the first to approve a vote for independence from Great Britain. The state also was the site of the first successful airplane flight, by the Wright brothers in 1903. The state capital is Raleigh.

Geography

North Carolina is located in the southeastern part of the United States. It is bordered by the Atlantic Ocean on the east, Virginia on the north, Tennessee on the west, and Georgia and South Carolina on the south.

Along the Tennessee border are the Appalachian Mountains. The major Appalachian ranges in North Carolina are the Great Smokies and the Blue Ridge. The central part of the state is an area with rolling, forested hills. North Carolina's largest natural region is the coastal plain in the east. Off the coast is a long chain of islands and sandy reefs known as the Outer Banks. North Carolina has a pleasant climate, with warm summers and mild winters.



People

The early European settlers in North Carolina represented a variety of nationalities, including English, Scottish, Irish, and German. Their descendants make up nearly three fourths of the state's people. African Americans account for more than a fifth of the population. The state's 100,000 Native Americans represent one of the largest Indian populations in the country.

Economy

North Carolina is among the nation's leading industrial states. The state's



Facts About NORTH CAROLINA

Flag



Population

(2000 census)
8,049,313—
rank, 11th state;
(2008 estimate)
9,222,414—
rank, 10th state

Capital

Raleigh

Area

53,819 sq mi
(139,389 sq
km)—rank, 28th
state

Statehood

November 21,
1789

Motto

Esse Quam Videri
(To Be Rather
Than to Seem)

State bird

Cardinal



State flower

Dogwood



long-established manufacturing industries include textiles, wooden furniture, and cigarettes. Among its newer industries are computers, electronic equipment, and chemicals. Other major industries include banking, real estate, and tourism. The main agricultural products include hogs, broiler chickens, greenhouse plants, and tobacco.

History

Native Americans have lived in what is now North Carolina for more than 15,000 years. The Cherokee were the largest group of Native Americans in the area when European settlers arrived.

In 1585 the English set up their first colony in North America on Roanoke Island, off the coast of North Carolina. The colony was not successful. More colonists landed on the island in 1587, but they disappeared by 1591. The only trace they left behind was the word Croatoan carved on a tree. The word may have referred to local Native Americans.

Virginians established the first permanent settlement in the mid-1600s. In 1663 the English king granted the Carolina region to eight Englishmen. North Carolina became a royal colony in 1729.

With the outbreak of the American Revolution (1775–83), loyalties in North Carolina were divided. The British government was overthrown in 1775, however, and an independent state government was established. North Carolina joined the Union in 1789 as the 12th state.



Sand dunes meet the Atlantic Ocean at Cape Hatteras National Seashore on Hatteras Island, North Carolina.

After 1835 North Carolina entered a period of great economic growth. The state's agricultural economy, however, depended on slave labor. Despite the role of slavery in North Carolina, the state was not quick to join other Southern states in the Confederacy before the American Civil War (1861–65). Once the war began in 1861, North Carolina withdrew from the Union and fought with the Confederacy.

After World War I (1914–18) manufacturing overtook agriculture as the most important part of North Carolina's economy. North Carolina changed rapidly after World War II (1939–45). Many people moved from the countryside to the cities, and new industries were established. The pleasant weather and scenery led many people to North Carolina to retire. The state's population grew at a record pace of almost 40 percent between 1990 and 2008.

► More to explore

American Civil War • Raleigh

North Dakota

The state of North Dakota lies on the Great Plains in the north-central United States. North of North Dakota is the country of Canada. North Dakota's nickname, the Peace Garden State, is a symbol of the friendship between the United States and Canada. Likewise, "Dakota" is an Indian word that means "friends." The capital of North Dakota is Bismarck.

Geography

North Dakota is bordered on the west by Montana, on the south by South Dakota, and on the north by the Canadian provinces of Manitoba and Saskatchewan. To the east, the Red River of the North separates North Dakota from Minnesota.

The western part of the state has a rolling surface that is dotted with buttes—flat-topped hills that rise above the surrounding plains. The Missouri is the state's major river in the west. A rugged region called the Badlands is located in the southwest. Most of North Dakota's farms are on smoother land in the eastern part of the state. North Dakota has a dry climate with hot summers and cold winters.

People

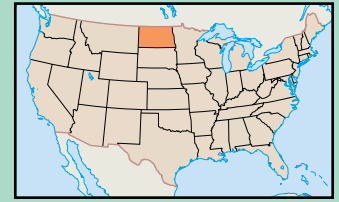
North Dakota is a largely rural state. More people live in farming areas than in cities. About 90 percent of North Dakotans are whites of European heritage. The earliest white settlers included many Norwegians, Canadians, and Ger-

mans. Before whites arrived there were various tribes of Plains Indians, including the Mandan, Sioux, and Ojibwa (Chippewa). Today Native Americans are the largest minority group in the state. They make up about 5 percent of the population.

Economy

North Dakota has traditionally been a farm state. The state is among the nation's leading producers of wheat. Other crops grown in North Dakota include barley, rye, oats, flax, sunflowers, soybeans, sugar beets, potatoes, and hay. Cattle are the most valuable livestock product.

North Dakota has been an important producer of petroleum (oil) since the 1950s. Manufacturing has been a growing part of the state's economy since the 1990s. Among other things, factories produce foodstuffs, machinery, and motor vehicle products.



Facts About NORTH DAKOTA

Flag



Population

(2000 census)
642,200—rank,
47th state; (2008
estimate)
641,481—rank,
48th state

Capital

Bismarck

Area

70,700 sq mi
(183,112 sq
km)—rank, 19th
state

Statehood

November 2,
1889

Motto

Liberty and Union
Now and Forever,
One and
Inseparable

State bird

Western
meadowlark



State flower

Wild prairie rose



History

Native American peoples lived in the region thousands of years before Europeans arrived. The first known European visitor was a French-Canadian explorer who arrived in 1738. Other colonists soon arrived from Canada to trap animals for their furs.

The region was acquired by the United States in 1803 as part of a land deal with France known as the Louisiana Purchase. Soon afterward the Lewis and Clark Expedition made its way through the area by way of the Missouri River. The first white settlement was established at Pembina in 1812.

Fur trappers were gradually replaced by wheat farmers and ranchers. The Dakota Territory was organized in 1861 and later divided into northern and southern regions. The coming of the railroads in the 1870s and 1880s brought new set-



Bales of hay lie in a farm field in North Dakota.



Rugged hills and few plants are typical of the Badlands of Theodore Roosevelt National Park in southwestern North Dakota.

tlers. In 1889 North Dakota became the 39th state.

During the 1930s North Dakota's farming community was devastated by terrible weather. A great drought parched the land, and high winds blew much of the fertile soil away.

The state's economy recovered after World War II (1939–45). In the 1950s North Dakota began producing oil. In 1954 work was completed on the massive Garrison Dam on the Missouri River. The dam was built to produce electricity. It also created a large lake, Lake Sakakawea. During the 1960s the United States government built many air bases and missile sites in North Dakota. Many military sites in the state were closed, however, in the 1990s. In 1997 a damaging flood took place along the Red River of the North.

► More to explore

Bismarck • Lewis and Clark Expedition

Northern Ireland



Northern Ireland is the smallest of the four parts of the United Kingdom, a country of western Europe. England, Scotland, and Wales are the other three parts. Northern Ireland is often called Ulster because it includes six of the nine counties that made up the ancient kingdom of Ulster. Its capital is Belfast.

Geography

Northern Ireland is in the northeastern corner of the island of Ireland. The country of Ireland takes up the rest of the island. The North Channel separates Northern Ireland from Scotland to the east. England and Wales lie across the Irish Sea, to the east and southeast.

Northern Ireland has rolling hills surrounded by low mountains. Near the middle of Northern Ireland is Lough Neagh, the largest lake in the United Kingdom. The northern coast is made up of thousands of rock columns. Northern Ireland has a cool, rainy climate with strong winds.

People

Northern Ireland has two main groups of people. About half of the people are descended from Scottish and English settlers who arrived in the 1600s. Most of these people are Protestant. About two fifths of the people are Irish. They are descended from the ancient Celts. These people are mainly Roman Catholic. Almost everyone speaks English.

Economy

Services such as health, education, government, and banking are very valuable to Northern Ireland's economy. Manufacturing and farming are important, too. Factories make automobiles, aircraft, textiles, clothing, and foods. Farmers raise pigs, cattle, sheep, and poultry. The major crops include barley, wheat, oats, and potatoes.

History

In about 300 BC the Celts invaded Ireland from Europe. They set up king-



The Giant's Causeway is a large rock formation on the northern seacoast of Northern Ireland.

doms, including Ulster in the north. England took control of Ireland in the 1100s. In the 1500s the English broke away from the Roman Catholic church and became Protestants. They tried to force the Irish to become Protestants as well. The Irish, who were mostly Roman Catholic, rebelled but were defeated. In the 1600s the English king sent Protestants from Scotland and England to settle in Ulster. The Protestants and the Roman Catholics fought one another.

In 1801 Ireland was officially joined to England, Scotland, and Wales to form the United Kingdom. The Irish people still did not accept British rule. In the early 1900s the Irish began to fight for independence. But the Protestants in the north wanted to stay in the United Kingdom. In 1920 the British government split the island into two parts. Northern Ireland was created out of the six mostly Protestant counties of the north. The other three northern counties joined the rest of Ireland, which became a separate country in 1921.

In the late 1960s fighting broke out between Catholics and Protestants in Northern Ireland. The British sent troops there to stop the violence. In response, a Catholic group called the Irish Republican Army (IRA) began to use terrorism against the British. The IRA wanted to force out the British and reunite Northern Ireland with Ireland. Thousands of people were killed or injured in the violence.

The IRA and the British government signed a peace agreement in 1998. In

1999 the British government gave Northern Ireland some power to govern itself. But some Protestants and Catholics found it hard to work together. When problems arose, the British government sometimes took their power away.

► More to explore

Belfast • Celt • England • Ireland
• Scotland • United Kingdom • Wales

Northern Territory



The Northern Territory is a territory of Australia. A territory is an area that belongs to a country but does not have the same rights as a state. The Northern Territory is huge, but only about 1 percent of Australia's people live there. Darwin is the capital and largest city.

Geography

On the north the Northern Territory borders the Timor Sea (part of the Indian Ocean) and the Arafura Sea (part of the Pacific Ocean). Three Australian states surround the territory—

Did You Know?

Northern Ireland is still sometimes called Ulster, after the ancient Celtic kingdom of that name.



Australia's Northern Territory features a huge stone formation called Uluru/Ayers Rock.

Queensland on the east, South Australia on the south, and Western Australia on the west. The Northern Territory covers an area of 520,902 square miles (1,349,129 square kilometers).

The territory's major rivers include the Roper, the Daly, the Victoria, the Katherine, the Adelaide, the Mary, the South and East Alligator, and the McArthur. Mount Zeil, at 4,957 feet (1,511 meters), is the highest point in the territory. Uluru/Ayers Rock is a huge, red stone formation that rises in the south. It is one of Australia's best-known symbols.

The northern part of the territory has a hot climate, with dry and wet seasons. The southern part is hot and dry.

People

About 200,000 people live in the Northern Territory. About half of them live in Darwin. The territory's other main city is Alice Springs. The rest of the Northern Territory has few or no people.

Most of the people of the Northern Territory have European roots. Aborigines (the original people of Australia) make up about one quarter of the population. The Aborigines live mostly in rural areas. Their culture and heritage have been well preserved.

Economy

Mining is the most important economic activity in the Northern Territory. The land contains bauxite (which is used to make aluminum), gold, manganese, zinc, lead, uranium, silver, oil, and natural gas. Tourism is another important industry. In addition, the territory has many huge cattle and sheep ranches, which are called stations.

History

Aborigines have lived in the Northern Territory for at least 40,000 years. Dutch traders visited the coast in the 1600s. Indonesian fishers came later.



An Aboriginal artist creates a painting in the town of Alice Springs, in the Northern Territory, Australia.

Did You Know?

Thousands of Chinese workers came to the Northern Territory during the gold boom of the 1870s. For a while the territory was mostly Chinese.

The British set up forts in the region beginning in 1824. In 1839 the British named a natural harbor on the coast Port Darwin, after the famous scientist Charles Darwin. The British founded the area's first lasting settlement at the harbor in 1869. They named it Palmerston.

In the 1870s the discovery of gold near Palmerston brought many settlers to the town. Telegraph and railroad lines soon connected it to the rest of Australia. Ranchers, farmers, and sheep herders settled there. At first the colony of South Australia controlled the Northern Territory. By 1911 the new Australian government had taken over the territory, and Palmerston was renamed Darwin.

The Northern Territory gained control over its own government in 1978. In 1998 the people voted not to become a state of Australia.

► More to explore

Aboriginal Peoples • Australia

North Korea

► see Korea, North.

North Sea

The North Sea is a part of the Atlantic Ocean. It lies between Great Britain and the northwestern European mainland. It covers an area of about 220,000 square miles (570,000 square kilometers). People have long used it for shipping and fishing.



The countries that border the North Sea are Norway, Denmark, Germany, The Netherlands, Belgium, France, and the United Kingdom. Many European rivers, such as the Rhine, the Seine, and the Thames, flow into the North Sea. Along the northern shores of the North Sea, the coastline is rugged. Norway has many rocky islands and steep inlets called fjords. Along the southern shores of the North Sea, the coastline is less rugged. The coast of The Netherlands is low and marshy. The British coast has low cliffs and sandy beaches.

The North Sea is one of the most dangerous seas in the world. It has wild storms and foggy winters. Because the sea is mostly shallow, the currents are strong. They often pull in different directions.

Even though the North Sea can be dangerous, it is important to trade. There are many ports on the North Sea where ships arrive and leave with goods. Fishing in the North Sea is a key industry. Another important North Sea business is drilling for petroleum (oil) and natu-



People have built platforms in the North Sea in order to drill for oil beneath the seafloor. Natural gas, which may escape during the drilling, appears as flames shooting from the platform.

ral gas. These resources were discovered under the sea floor in the 1950s.

The North Sea helped Europe grow. After the Middle Ages (about AD 500 to 1500), Europeans traveled and traded mainly by ship. They landed in North Sea ports to trade goods and share ideas and inventions.

► More to explore

Atlantic Ocean • Europe

Northwest Passage

For centuries explorers tried to find a route from the Atlantic Ocean to the Pacific Ocean through the waters surrounding Canada's Arctic islands. They

called that route the Northwest Passage. They knew that finding the passage would increase trade for many nations. In 1906 the Norwegian explorer Roald Amundsen became the first person to complete the voyage by sea.

The Northwest Passage is located about 500 miles (800 kilometers) north of the Arctic Circle and less than 1,200 miles (1,900 kilometers) from the North Pole. The passage is made up of a series of channels through Canada's Arctic islands. It extends about 900 miles (1,450 kilometers) from east to west, from north of Baffin Island to the Beaufort Sea, north of Alaska.

Navigating the Northwest Passage can be dangerous, especially because of thousands of huge icebergs. Many



There is more than one route through the Northwest Passage. The Norwegian explorer Roald Amundsen went south of Victoria Island, but later explorers stayed north of it.

famous explorers, including John Cabot, Jacques Cartier, Sir Francis Drake, and Captain James Cook, tried unsuccessfully to find the passage. In 1845 Sir John Franklin and 128 men disappeared during their voyage. While searching for Franklin, Robert McClure sailed his ship

into the passage's western entrance. The ship then became frozen in the ice for two winters. McClure and his men finally gave up on the ship and traveled by land to meet another ship to the east. Thus they completed the first crossing of the Northwest Passage in 1854, though in more than one ship and partly on foot.



Roald Amundsen (left) and his crew members pose for a photograph aboard the ship on which they made the first successful trip through the Northwest Passage.

The Northwest Passage was not conquered entirely by sea until Amundsen's voyage. Amundsen and his crew sailed from east to west in a fishing boat. The trip lasted from 1903 to 1906.

A Canadian named Henry A. Larsen made the first west–east sea voyage in 1940–42. In 1944 Larsen sailed through the passage in one season.

► More to explore

Amundsen, Roald • Exploration
• Navigation

Northwest Territories

A land of forests and tundra, the Northwest Territories covers a vast part of northern Canada. The capital is Yellowknife.

Geography

Only part of the Northwest Territories is on the North American mainland. The rest is made up of islands in the Arctic Ocean in the north. Nunavut is the eastern neighbor of the mainland part of the Territories. To the south are Saskatchewan, Alberta, and British Columbia. The Yukon Territory lies to the west.

The Mackenzie Mountains form a rocky wall along the western edge of the Territories. The plains east of the mountains are heavily forested. The Mackenzie River, the longest river in Canada, flows through the plains. It connects the Territories' two large lakes, Great Slave Lake and Great Bear Lake, to the Arctic Ocean. In the north and east the land is barren, icy tundra.

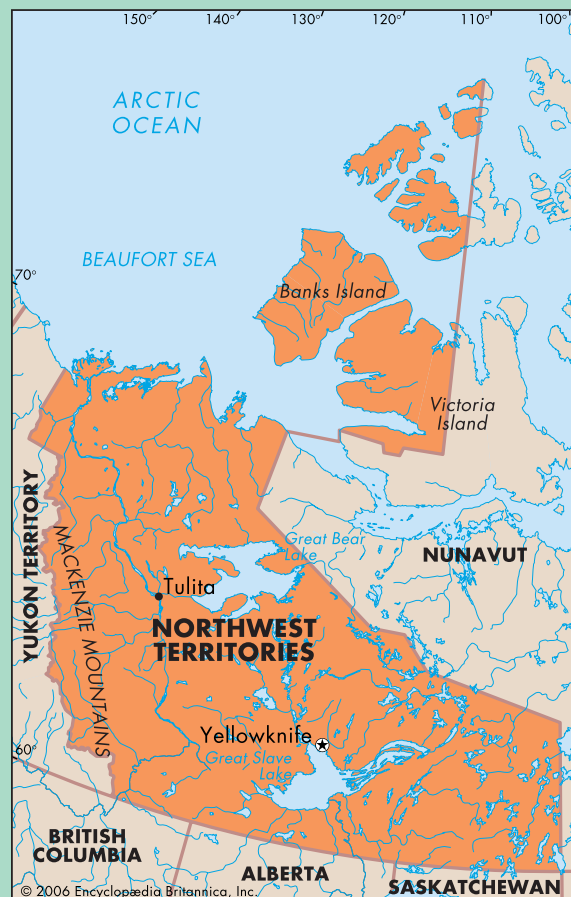
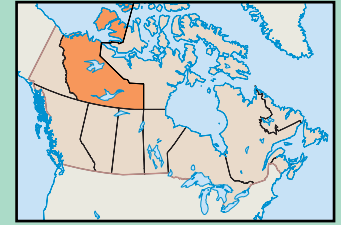
People

Native peoples make up about half of the population of the Northwest Territories. Most are American Indians who speak Athapaskan languages. They call themselves Dene. The other native group is the Eskimo (Inuit). There are also several thousand Métis—people of mixed American Indian and European heritage. Most of the rest of the people are of European descent.

For such a large area, the Territories has a very small population. Vast parts of the Territories have no people at all. Nearly all the people live in small settlements near the Mackenzie River. Yellowknife, on the northern shore of Great Slave Lake, is the only real city. Most of the Eskimo live along the Arctic coastlines of the mainland and the northern islands.

Economy

Diamond mining is the Territories' leading industry. Mines also provide some gold, silver, zinc, and lead. The production of oil and natural gas is another valuable industry.





In the winter cars and trucks in parts of the Northwest Territories travel on ice roads, or roads made of ice and snow. Ice roads run across frozen lakes and land to connect the city of Yellowknife to the town of Dettah and to several distant diamond mines.

Facts About NORTHWEST TERRITORIES

Flag



Population
(2006 census)
41,464

Area
519,735 sq mi
(1,346,106 sq
km)

Capital
Yellowknife

Motto
none

**When
Northwest
Territories
Became a
Territory**
1870

Many residents of the Northwest Territories work in government, and tourist services are growing. Still, many of the people make a living through fishing, hunting, and trapping. Muskrats, beavers, martens, mink, lynx, and foxes provide valuable furs. Many people also make money by selling arts and crafts.

History

Dene and Eskimo peoples arrived in what is now the Northwest Territories thousands of years ago. The English sailor Martin Frobisher explored the coast in 1576 while looking for a sea route to Asia. In 1789 the Scottish explorer and fur trader Alexander MacKenzie traveled to the Arctic Ocean along the river that is now named for him.

The first settlements in the area served mostly fur traders. For 200 years,

beginning in the late 1600s, a British fur-trading corporation called the Hudson's Bay Company controlled much of the land. The region was called Rupert's Land. The rest of the land, the North-Western Territory, was under British rule. In 1870 all of the land was given to the new country of Canada. The combined area was called the Northwest Territories. In 1880 Great Britain's Arctic islands were added to the Territories.

Fur traders, missionaries, and police controlled the life of the Northwest Territories until the 1920s. Then oil was discovered near Fort Norman on the Mackenzie River. The discovery led Canada to create a government for the territory. In 1999 the size of the Territories was reduced by more than half when the territory of Nunavut was created as a homeland for the Eskimo.



An Eskimo fisherwoman hangs fish to dry at her camp along the Mackenzie River in the Northwest Territories.

► More to explore

Arctic Ocean • Athapaskan • Canada
• Eskimo • Fur Trade • Hudson's Bay
Company • Nunavut • Tundra

Norway

The Kingdom of Norway is farther north than most other countries in Europe. In early times the Vikings controlled Norway. Modern Norway is a prosperous, independent country. The capital is Oslo.

Geography

Norway is part of the northern European region known as Scandinavia. It shares borders with Sweden, Finland, and Russia. The Arctic Ocean lies to the north, and the Atlantic Ocean is to the west. The North Sea lies to the south. Norway controls the Svalbard Islands to the north as well as many small islands off the west coast.

About two thirds of Norway is mountainous. Norway's highest peak, Galdhøpiggen, rises 8,100 feet (2,469 meters) above sea level. The south is mainly flat. Long, narrow arms of the sea—called fjords—stretch inland on the western coast. The country also contains more than 1,500 glaciers, or huge blocks of slowly moving ice.

The western coast has cool summers and mild winters. The east has warmer summers and colder winters. North of the Arctic Circle the sun does not set for most of the summer. However, in part of the winter the sun never rises.

Plants and Animals

Forests cover about a quarter of the country. The main trees include pine,

spruce, birch, and ash. Leafy mosses and heathers grow on the floor of many forests.

Small mammals such as hares, foxes, and badgers are common. Elk, reindeer, lemmings, and wolves live in the forests and mountains. Numerous trout, salmon, and other fish swim in Norway's waters.

People

Most Norwegians are Nordic, a European people with German roots. There are small groups of Asians and other Europeans. Several thousand Sami, or Lapps, live mainly in the north. The Sami are known for herding reindeer. They were once nomads, or wanderers, but they now live in permanent homes. Norwegian is the main language of the country. The Evangelical Lutheran branch of Christianity is the national religion. Most people live in cities, mainly in the southeast.





Lights surrounding the harbor at Bergen twinkle in the twilight. Bergen is a busy port and one of Norway's largest cities.

Economy

Norway is one of the world's largest suppliers of oil. The country also has rich deposits of natural gas and minerals. Norway's industries make food products, ships, machinery, metals, paper products, and other goods. Fishing and logging are important to the economy.

Most workers work in services, including communications, banking, and health care. Farming is only a small part of the economy. Farmers produce mainly grains, dairy products, and meat.

History

The Sami arrived in what is now Norway at least 10,000 years ago. Vikings from Norway raided and traded along Europe's coasts during the AD 800s–1000s. King Olaf II Haraldsson united all of Norway in the 1000s.

In the late 1300s Norway, Sweden, and Denmark came under the rule of one king. Norway was the weakest country in the union. Sweden gained indepen-

dence in 1523, but Denmark continued to control Norway. In 1814 Denmark lost control of Norway to Sweden. In 1905 Norway declared its independence.

Nazi Germany invaded Norway in 1940, during World War II. The Nazis set up a pro-German government in Norway. The Germans left in 1945, at the end of the war.

In 1949 Norway joined the North Atlantic Treaty Organization (NATO), a group of nations that promised to protect each other. However, Norway did not join the European Union.

► More to explore

Oslo • Vikings

Facts About NORWAY



Population
(2008 estimate)
4,762,000

Area
125,004 sq mi
(323,758 sq km)

Capital
Oslo

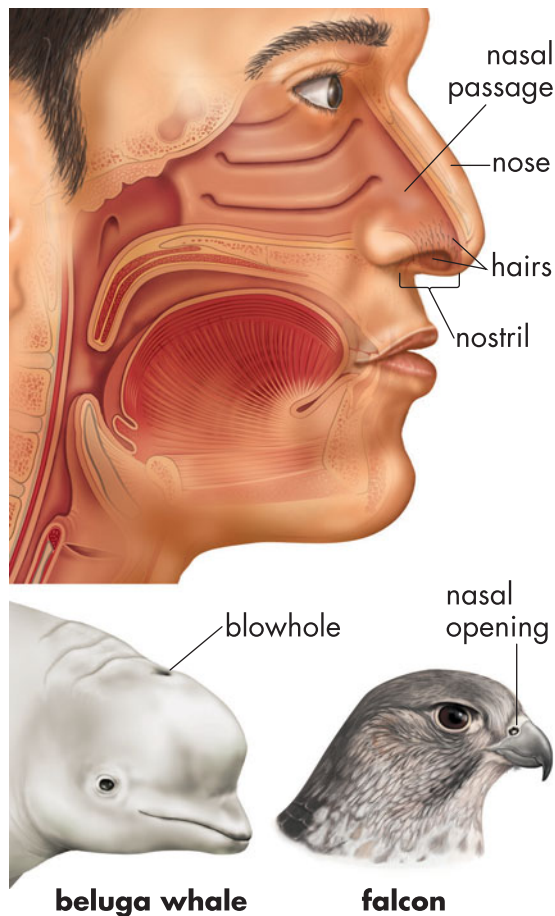
Form of government
Constitutional monarchy

Major cities
Oslo, Bergen, Trondheim, Stavanger, Bærum



A Sami father and son in northern Norway wear traditional clothing.

Nose



The nose is an important organ, or body part, for breathing and smelling. In humans, the nose is located in the middle of the face, above the mouth. The two openings in the nose are called nostrils. Many other animals also have a nose. Some have only nasal openings.

The Human Nose

When a person breathes, air enters the nostrils, travels through the throat, and goes down into the lungs. A wall of tough, bendable tissue called cartilage separates the nostrils into two tubes, or nasal passages. A liquid called mucus lines the nasal passages. It helps to moisten the air. It also traps dirt and

bacteria carried in the air. Hairs in the nasal passages help to clean the air, too.

When air enters the nasal passages, it brings different scents with it. Tiny nerve endings in the lining of the nasal passages pick up these scents. They carry information about the scents to the brain.

Blockages or irritation in the nasal passages can make breathing and smelling difficult. Colds, allergies, infections, and pollutants in the air are some of the things that can cause these problems. Injuries to the nose also can cause breathing problems.

How Other Animals Smell

Many mammals, including dogs, have a very strong sense of smell. They use their nose to smell food, mates, and territories. However, some mammals do not have a nose or a good sense of smell. A whale, for example, has a blowhole, or nostril, on the top of its head for breathing. Some types of whale can smell through the blowhole, but others cannot.



A pig's nose is called a snout.



An elephant's trunk is a kind of nose. It helps the elephant breathe and smell things. But it is also used like a hand to pick up things.

Birds, reptiles, amphibians, and fish have nasal openings that allow them to smell. In fish and some amphibians, water passes through these openings instead of air. Some reptiles, including snakes, have an extra smelling organ on the roof of the mouth. A snake sticks out its tongue to collect scents. Then it rubs its tongue against the roof of its mouth to smell them.

► More to explore

Mouth • Respiratory System • Senses

Nouakchott



Population
(2005 estimate)
743,500

Nouakchott is the capital of Mauritania, a country in northwestern Africa. The city lies near the coast of the Atlantic

Ocean. Most of Nouakchott was built in the 1960s, which makes it quite new for a city. It grew quickly into Mauritania's largest city.

Nouakchott features mosques and a bustling market. It is a center of government and some business and industry. Copper and other products are shipped out from a port just outside the city. Oil was discovered near Nouakchott in the early 21st century.

During much of the 1800s and 1900s France ruled Mauritania. During that period Mauritania had no capital of its own. In the 1950s Mauritania began preparing to become independent from France. Nouakchott was chosen to be the new capital in 1957. At the time only about 400 people lived there.

In 1960 Mauritania became an independent country with Nouakchott as its capital. The city then grew greatly.

► More to explore

Mauritania



A veiled woman looks at cloth in one of Nouakchott's modern shops.

Nova Scotia

Along with New Brunswick and Prince Edward Island, Nova Scotia is one of Canada's Maritime Provinces. No part of Nova Scotia is more than 35 miles (56 kilometers) from the sea, which is key to life in the province. The capital is Halifax.

Geography

The province includes the peninsula of Nova Scotia, Cape Breton Island, and a few smaller islands. A narrow strait separates the peninsula from Cape Breton Island. The peninsula is connected to New Brunswick by a strip of land that is only 17 miles (27 kilometers) wide. Otherwise, Nova Scotia is surrounded by the sea. The Atlantic Ocean is to the east, the Gulf of Saint Lawrence is to the north, and the Bay of Fundy is to the southwest.

Nova Scotia lies within the Appalachian Mountains. Its landscape is mostly low mountain ranges separated by lowlands. The valley of the Annapolis River is called the garden of Nova Scotia because

the soil is good for farming. The lowlands along the Bay of Fundy are marshy because of the bay's very high tides. The Atlantic coastline is rocky, with many bays and coves.

People

More than half of Nova Scotia's people have Scottish, English, or Irish ancestors. French Canadians are the next largest group. They are descended from the original settlers of the territory. Most of the rest of the people have roots in other European countries, though there are small American Indian, Asian, and black minorities.

Most Nova Scotians live near the coast. About 40 percent of them live in Halifax, the largest city in the Maritime Provinces. Located on the southeast coast, Halifax has one of the world's largest natural harbors. Cape Breton, on Cape Breton Island, is the second largest city in Nova Scotia.

Economy

Like the rest of Canada, Nova Scotia now has a service-based economy. Most Nova Scotians work in service industries such as sales, banking, tourism, transportation, and shipping. The port of Halifax is one of Canada's busiest.

However, Nova Scotia's economy still relies heavily on natural resources. The fishing industry produces valuable catches of swordfish, tuna, scallops, lobsters, cod, and herring. Not much of the



land is good for farming, but Nova Scotia is still known for its fruits and vegetables. Farmers also raise chickens and dairy cows. Manufacturing plants process fish and farm products and make wood and paper products. Minerals produced in Nova Scotia include coal, salt, and gypsum, which is used in construction.

History

Micmac Indians lived in what is now Nova Scotia when the explorer John Cabot arrived in 1497. He claimed the land for England. In 1605 the French explorers Samuel de Champlain and Pierre de Monts arrived. They started Port Royal, the first colony in what is now Canada, on the Bay of Fundy. They called the land Acadia. In 1621, however, English and Scottish colonists renamed the land Nova Scotia, which means “New Scotland” in Latin.

Facts About NOVA SCOTIA

Flag



Population

(2006 census)
913,462

Area

21,345 sq mi
(55,284 sq km)

Capital

Halifax

Motto

*Munit Haec et
Altera Vincit* (One
Defends and the
Other Conquers)

**When Nova
Scotia Became
a Province**
1867



A group of young children wearing traditional Scottish clothing perform at a festival in Antigonish, Nova Scotia.



Cape Breton Highlands National Park is a popular recreational area with scenic hills and forests. It lies in the northern part of Cape Breton Island, in Nova Scotia, Canada.

The French and the British fought over the land for many years. In 1713 a treaty gave the peninsula to the British. In 1755 the British forced most of the French settlers to leave. Great Britain took over Cape Breton Island in 1763 and later made it part of Nova Scotia. Britain also ruled Prince Edward Island and New Brunswick as parts of Nova Scotia. They split off in 1769 and 1784, respectively. During and after the American Revolution (1775–83), many American colonists loyal to Britain moved to Nova Scotia.

In 1867 Nova Scotia became a part of the new country of Canada. During World War I (1914–18) and World War II (1939–45) Halifax played a key role in shipping troops and supplies to Europe. In later years Nova Scotia prospered with the rise of tourism.

► More to explore

Appalachian Mountains • Cabot, John
• Canada • Champlain, Samuel de

Nubia



Nubia was an ancient region of north-eastern Africa. Its northern neighbor was ancient Egypt. Egypt ruled Nubia for thousands of years. Beginning in the 700s BC, however, the Nubian kingdom of Kush (or Cush) ruled Egypt for a short time. Nubia is now in the countries of Egypt and Sudan.

Ancient Nubia bordered the Red Sea on the east and the Libyan Desert on the west. It stretched south to what is now Khartoum, Sudan. The region had little rainfall, but farmers grew crops with water from the Nile River. The land was rich in gold and precious stones. The people of Nubia were black Africans.

Just after 3000 BC Egypt took over Nubia. Sometime after about 2181 BC newcomers entered Nubia from Libya in the west. They settled along the Nile as cattle herders. These immigrants devel-

oped their own civilization with unique crafts and architecture.

Egypt eventually took back control of Nubia. In the 1400s BC the pharaoh (Egyptian king) Thutmose I divided Nubia into two parts. The north became Wawat. The south became Kush.

In about 1000 BC Kush started growing stronger. By about 715 BC the people of Kush, called Kushites, had conquered all of Egypt. Soon, however, the Assyrians from Asia drove the Kushites from Egypt. The Kushites went back to Nubia, where they ruled for almost 1,000 years. In about AD 350 the kingdom of Aksum took over Kush.

By the late AD 500s, there were three Christian kingdoms in Nubia: Nobatia, Makuria, and Alodia (also known as Alwa). Muslim Arabs conquered Egypt in the AD 600s. But they did not conquer the Nubian kingdoms for hundreds of years. Alodia did not fall until about 1500.

► More to explore

Egypt, Ancient • Kush • Sudan

Nuclear Energy

The energy that holds together the nucleus of an atom is called nuclear, or atomic, energy. Atoms are the basic building blocks of matter. The nucleus is the central part of an atom.

When nuclear energy is released, it changes into other forms of energy. These forms of energy are called radia-

Did You Know?

Much of ancient Nubia now lies under Lake Nasser, which was created when the Aswan High Dam was built across the Nile River in the 1960s.



Nuclear power plants often have huge cooling towers. The towers are used to cool water that becomes heated during the process of creating electricity.

tion. Heat and light are examples of radiation.

How Nuclear Energy Is Released

Nuclear energy can be released through processes called nuclear fusion and nuclear fission. Nuclear fission happens when the nucleus of an atom splits into two or more parts. Nuclear fusion happens when two nuclei join to form a single nucleus. The nuclei of certain kinds of atoms can give off nuclear energy without fission or fusion taking place. These atoms are called radioactive.

Nuclear fusion happens naturally in stars such as the sun. There atoms are constantly combining and creating nuclear energy. That energy is the source of the heat and light that Earth gets from the sun.

In the 1930s scientists discovered that they could make nuclear fission happen in certain kinds of atoms. They made their discovery while working with atoms of the substance called uranium. They split the nucleus of a uranium atom in two by bombarding it with particles called neutrons. Nuclear fission releases a lot of energy. For example, the fission of 1 pound (0.5 kilogram) of uranium produces as much energy as burning 3,000 tons of coal.

Nuclear Weapons

During World War II (1939–45) countries worked to build a weapon that used nuclear energy. The result was the nuclear, or atomic, bomb. The United States dropped the first nuclear bomb on the city of Hiroshima, Japan, on August 6, 1945. The explosion destroyed most of the city and killed more than 70,000 people instantly. Sci-

entists later discovered how to use nuclear fusion to make an even more powerful bomb, the hydrogen bomb.

Nuclear Power Plants

Nuclear energy is used for peaceful purposes, too. In many countries nuclear fission is used in nuclear power plants. The heat it produces runs machines to create electricity.

Nuclear fission in nuclear power plants produces radioactive waste. This waste gives off radiation that can be harmful. Nuclear power plants are designed to be safe. But accidents have happened. In 1986 a very serious accident happened at the Chernobyl nuclear power plant in what is now the country of Ukraine. Radioactive gases leaked out of the plant and into the air. They ruined crops and livestock and caused harm to many people.

► More to explore

Atom • Bomb • Energy • Radiation

Nuku'alofa

Nuku'alofa is the capital of Tonga, an island country in the southern Pacific Ocean. The city lies on the coast of Tongatapu Island. It is the country's largest city and main port. From the port, dried coconut and other foods are shipped out for sale overseas. Tourism and a few industries also bring money to the city.

People have lived on Tongatapu Island for at least 3,000 years. In the 1800s King George Tupou I made Nuku'alofa his capital. George Tupou I was the



The king of Tonga lives in the royal palace at Nuku'alofa.

founder of Tonga's ruling family. The royal palace in Nuku'alofa was built in the 1860s.

► More to explore

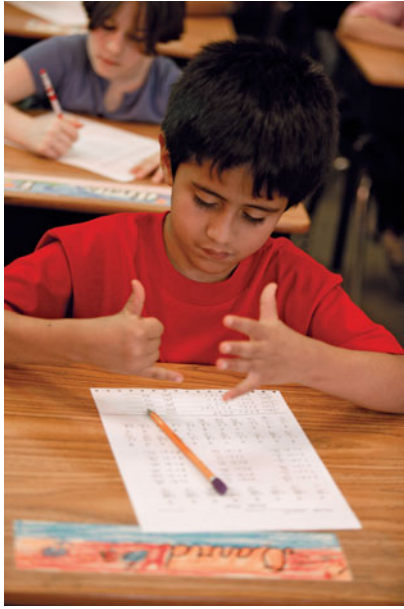
Tonga

Numbers and Number Systems

A number is a basic unit of mathematics. Numbers are used for counting, measuring, and comparing amounts. A number system is a set of symbols, or numerals, that are used to represent numbers. The most common number system uses 10 symbols called digits—0, 1, 2, 3, 4, 5, 6, 7, 8, and 9—and combinations of these digits.

Kinds of Numbers

Numbers can be classified in many ways. The simplest class is the natural, or



A pencil and paper are more useful than fingers as tools for counting.

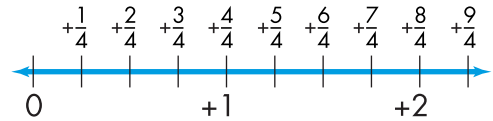
counting, numbers (1, 2, 3, ...). With the addition of 0, these are known as the whole numbers.

The natural numbers are also called positive numbers because they are greater than 0. For each of the positive numbers, there is also a negative number (−1, −2, −3, ...). Negative numbers are less than 0. The natural numbers, their negative equivalents, and 0 make up the set of numbers called integers. The integers can be pictured as points on a line that continues forever in both directions:



Fractions are numbers that represent parts of a whole. Fractions are written as digits separated by a line, as in $\frac{3}{4}$. The digit below the line is called the denominator. The digit above the line is called

the numerator. In reading a fraction, the numerator is stated first. For example, $\frac{3}{4}$ is read as “three fourths.” Fractions can be shown on a number line, too:

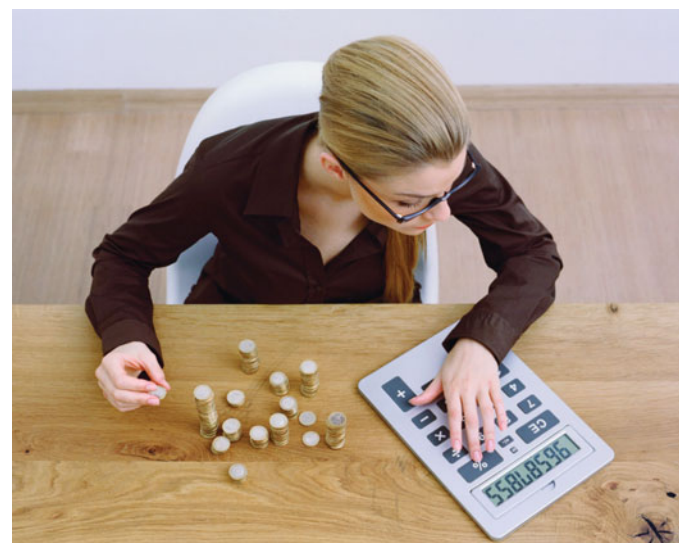


Fractions can also be written in a form called decimals. Decimals are written using the digits (0–9) along with a dot called a decimal point. A fraction can be changed to a decimal by dividing the numerator by the denominator.

Ancient Number Systems

The first system of numbers was probably the tally system. In this system a separate mark was made for every item being counted. This system was useful only with small numbers.

The ancient Egyptians developed a complex system for writing large numbers in symbols called hieroglyphics. There was a single hieroglyphic symbol for the



Electronic calculators help people do many types of math problems.

number 1,000. But to write the number 999, it was necessary to write the symbol for 100 nine times, then the symbol for 10 nine times, and finally the symbol for 1 nine times.

The ancient Romans used letters to represent numbers—I for 1, V for 5, X for 10, L for 50, C for 100, D for 500, and M for 1,000. This system is known as Roman numerals. In Roman numerals, 256 is written as CCLVI.

Base-ten and Other Systems

The most common number system used today is called the base-ten, or decimal, system. It has 10 digits (0–9) that can be combined to write any number. The base-ten system was invented by Hindus in ancient India. Later, Arabs improved the system. For this reason the digits 0–9 are called Hindu-Arabic numerals.

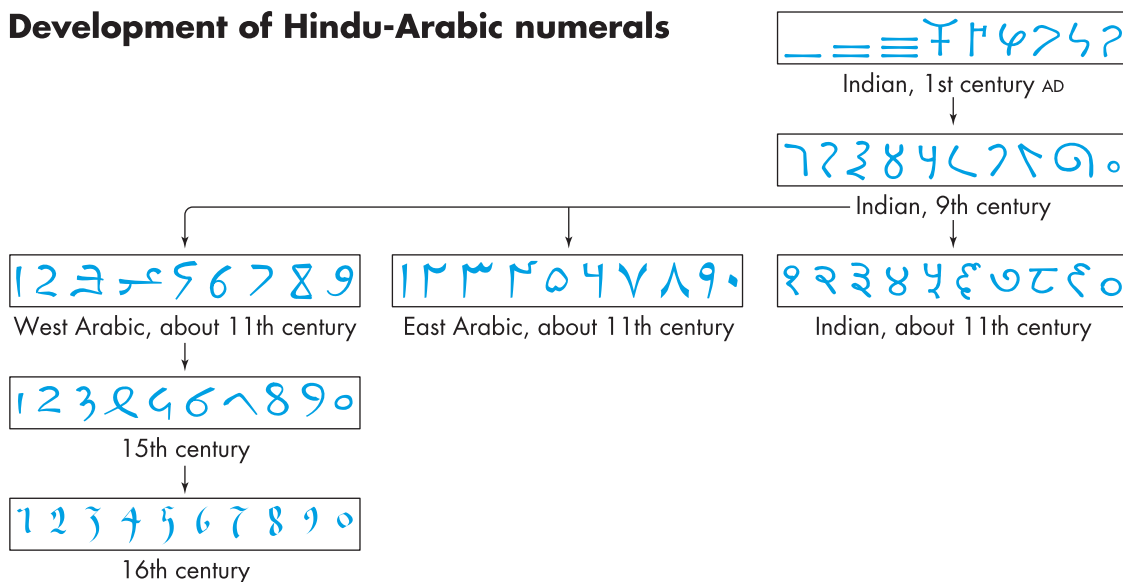
In the base-ten system, the value of each digit is based on its position, or “place,” in a number. There is a “ones place,” a “tens place,” a “hundreds place,” and so forth. In the number 456, for example, the 4 is in the hundreds place, the 5 is in the tens place, and the 6 is in the ones place. Written in another way, the number 456 actually represents $(4 \times 100) + (5 \times 10) + (6 \times 1)$.

For some purposes other number systems are more useful than base-ten. For example, computers use the base-two, or binary, number system. Instead of 10 digits, this system uses only two—0 and 1. In a computer these numbers stand for “off” and “on,” the only two possible states of the computer’s electric switches.

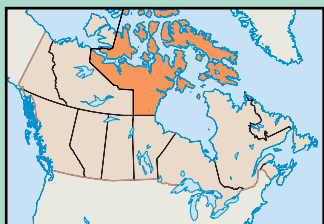
► More to explore

Mathematics • Roman Numerals

Development of Hindu-Arabic numerals



Hindu-Arabic numerals are now used in most of the countries of the world. It took more than 1,500 years for the numerals to develop their modern shape. People who write in the Arabic alphabet still use an older form of Hindu-Arabic numerals called East Arabic numerals.



Nunavut

Nunavut is Canada's newest territory. It was created in 1999 from the eastern part of the Northwest Territories. The area has been the home of the Eskimo people for a thousand years. The Eskimo in the territory call themselves Inuit. Nunavut means "Our Land" in their language. The capital of Nunavut is Iqaluit.

Geography

Nunavut takes up about one fifth of Canada's area. Nunavut borders on the Arctic Ocean, Hudson Bay, and Baffin Bay. It touches the Northwest Territories and the province of Manitoba. The territory includes most of Canada's Arctic islands.



Nunavut's climate is cold. Snow falls even in the summer. The far northern parts of Nunavut have 24 hours of daylight during the longest days of summer. During the shortest days of winter the sun never appears in those parts. Most of Nunavut's land is tundra, the rocky plain of the Arctic regions.

People

Nunavut has large areas of land where few people live. About 80 percent of the population is Eskimo. The rest of the people have European ancestors. Nunavut has one of the youngest populations in Canada.

Nunavut has fewer than 30 communities. Because there are few roads and no railroads, cities get supplies by airplane or boat. Iqaluit (named Frobisher Bay until 1987) is the largest city. Located on Baffin Island on the eastern edge of Nunavut, it is a communication and transportation center. Rankin Inlet, on the west shore of Hudson Bay, began on the site of a nickel mine. The community remained after the mine closed in the 1960s.

Economy

The largest employer in Nunavut is the government. As Nunavut has begun to build more roads and schools, the construction industry has also grown. Several fish and meat processing plants operate in Nunavut. Lead, zinc, silver, and gold are mined in the territory. Nunavut earns some money from tour-

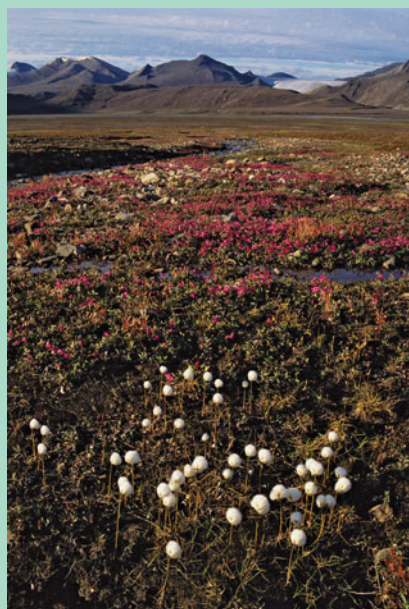
ism. Still, unemployment remains a serious problem.

Many of the Eskimo still live off the land. They fish, hunt seals, and trap animals. A number of Eskimo make and sell traditional crafts, including soapstone carvings, prints, and tapestries.

History

People have lived in what is now Nunavut for at least 4,000 years. The first people were the Dorset culture, or Tuniit people. In about AD 1000 the Eskimo, who had moved eastward from what is now Alaska, replaced the Dorset culture.

In the late 1500s Europeans began exploring the area. From 1576 to 1578 the English explorer Martin Frobisher made three trips to what is now Nunavut. Europeans later set up a whaling industry there. Great Britain and its Hudson's Bay Company claimed parts



Mosses, herbs, and other low-growing plants cover the tundra of Nunavut.



A Nunavut villager fishes through a hole in the ice.

of the land in the 1800s. In 1870 the land became part of Canada's Northwest Territories.

In the early 1900s the whaling industry collapsed. Fur trading, oil, and mining became important industries. During and after World War II (1939–45) the United States and Canada built airfields and radar stations across the Arctic.

In the 1960s the Eskimo began to ask the Canadian government for control of the land on which they lived. In 1993 Canada voted to create a new territory out of the eastern part of the Northwest Territories. The government granted about 135,000 square miles (350,000 square kilometers) of that land to the Eskimo people. It also promised more than 1 billion dollars to the Eskimo. Nunavut officially became a territory of Canada in 1999.

► More to explore

Arctic Ocean • Canada • Eskimo
• Hudson Bay • Hudson's Bay Company • Northwest Territories
• Tundra

Facts About NUNAVUT

Flag



Population
(2006 census)
29,474

Area
808,185 sq mi
(2,093,190 sq km)

Capital
Iqaluit

Motto
Nunavut
Sanginivut
(Nunavut, Our Strength)

When Nunavut Became a Territory
1999

Did You Know?

Trials were held in Tokyo for the war criminals of Japan. Japan and Germany had fought on the same side in World War II.

Nuremberg Trials

In 1945 and 1946 former leaders of Nazi Germany were put on trial for crimes committed during World War II. The trials were run by the countries that had defeated Germany in the war. They took place in Nuremberg, Germany.

The court that held the trials was called the International Military Tribunal. Judges from the United States, Great Britain, France, and the Soviet Union took part. The defendants (the people put on trial) had been leaders of the German government and the Nazi Party during the war. Adolf Hitler, the top leader of Nazi Germany, could not be tried because he was already dead.

The defendants were accused of crimes against peace, war crimes, and crimes against humanity. The crimes against peace included planning and starting the war. The war crimes were violations of the laws of war. They included enslaving and killing prisoners captured during the war. The worst of the crimes against



Nazi leader Hermann Göring stands in the prisoner's box during his trial for war crimes in Nuremberg, Germany.

humanity was killing millions of Jews and other people in the Holocaust.

Some of the defendants claimed that only the German government, not individual people, could be found guilty. Other defendants claimed that they were not responsible because they were only following orders. The judges rejected both excuses.

All but three of the 22 defendants were found guilty. Ten were put to death. The others received long prison terms.

► More to explore

Holocaust • Nazi Party • World War II

Nursery Rhyme

Nursery rhymes are short verses and songs for children. Many nursery rhymes tell a quick story in just a few lines. Their clever use of language makes them easy to remember.

Nursery rhymes are entertaining for children to hear. They often have silly subjects. They also use amusing patterns of sound and rhythm. Most of them rhyme, or repeat the sounds at the ends of certain lines—as, for example, in “Hey, diddle, diddle / The cat and the fiddle” or “Along came a spider / And sat down beside her.” Children can learn speech patterns from such poems. This can help them to become better readers and speakers.

Most nursery rhymes date from the 1500s through the 1700s. Many of them were originally created as popular

songs for adults. For many years nursery rhymes were only spoken aloud, not written down. The earliest known book of nursery rhymes was published in 1744.

A make-believe old woman named Mother Goose first appeared in a British book of nursery rhymes from the 1760s. It has become traditional to say that Mother Goose writes nursery rhymes, but she is just a character. No one knows who wrote most nursery rhymes.

► More to explore

Literature for Children • Mother Goose
• Poetry

Nursing

Nurses make up the largest group of health care workers in the world. They work with doctors and other medical providers to care for people who are sick or injured.

What Nurses Do

Most nurses work along with doctors in hospitals, clinics, or offices. They often work with nurse's aides or assistants, too. Nurses find out about a patient's health by asking questions. They also check such signs as blood pressure and temperature. Nurses give medicine, change bandages, help patients move around, and provide other treatment. They give advice on how to get well and how to stay healthy. They comfort frightened patients and worried family members.



A nurse listens to a patient's heart with a stethoscope.

Many nurses specialize in a certain area. Some nurses assist doctors during surgery. Some care mainly for children or the elderly. Others care for patients with mental illnesses. Still other nurses help patients in private homes.

Some nurses work more independently, with less instruction from doctors. Nurse practitioners examine patients and manage their care. Nurse midwives deliver babies. These nurses generally need more education and training than other nurses.

History

Throughout history family members and religious people have cared for the sick. But the profession of nursing did not exist until fairly recently.

One pioneer in the field of nursing was Florence Nightingale. During the Crimean War (1854–56) she nursed

British soldiers and worked to improve conditions in hospitals. In the United States Clara Barton played a similar role. She and other women cared for sick and wounded men fighting in the American Civil War (1861–65).

The profession of nursing developed along with the rise of hospitals around the world. As the demand for hospital nurses grew in the early 1900s, more nursing schools opened. During this time nursing was one of the few professions acceptable for women, and most nurses were women. That changed gradually. Today women can be doctors or nurses. Similarly, both men and women now work as nurses.

► More to explore

Barton, Clara • Hospital • Medicine
• Nightingale, Florence

Nut

A nut is a dry, hard fruit that contains one seed. The hard layer that surrounds the seed is known as the shell. People remove



The hazelnut seed can be seen when the shell is split open. The seed is the part that people eat.

the shell, often by cracking it open, before eating the seed. Nuts grow on trees in many parts of the world.

True nuts include acorns, beechnuts, chestnuts, and hazelnuts. Acorns grow on oak trees. A scaly cap that develops from a flower holds each acorn. Beechnuts grow on beech trees, and chestnuts grow on chestnut trees. These nuts develop inside prickly cases. Hazelnuts, also called filberts, grow on filbert trees. Hazelnuts grow inside leafy husks.

Many of the foods that people think of as nuts are not true nuts. Peanuts are actually legumes, or fruits in the form of pods. People eat the seeds inside the pods. Almonds, macadamia nuts, pistachios, pecans, and walnuts are the pits of fruits called drupes. Each pit is a shell that holds a seed. Brazil nuts are seeds that grow in woody pods. Pine nuts are seeds that grow in pinecones.

People and animals eat many kinds of nuts. Nuts are a rich source of protein and fat. People often roast nuts before eating them. They also use them in baked goods and other dishes. In addition, people use the oils contained in some nuts to make paints, soaps, and other products.

► More to explore

Almond • Chestnut • Fruit • Oak
• Peanut • Seed

Nutrition

► see Food and Nutrition.



Oceans cover nearly 71 percent of Earth's surface. They contain almost 98 percent of all the water on Earth.

(See Ocean.)

The ocelot, a wild cat with short, spotted fur, lives in North and South America.

(See Ocelot.)

In Norse mythology, the god Odin had a horse with eight legs that could gallop through the sky and over the sea.

(See Odin.)

An ancient people called the Olmec carved huge heads that were up to 10 feet (3 meters) tall and weighed up to 20 tons.

(See Olmec.)

It took about four to six months for pioneers to travel the Oregon Trail from Missouri to what is now Oregon.

(See Oregon Trail.)

Oak



The branches of a white oak spread wide.

Oaks are trees and shrubs of the beech family. There are about 450 species, or types, of oak. They are common in places with mild weather.

Oak trees can grow to 150 feet (45 meters) high. They have thick trunks and large branches that spread wide. The leaves can have rounded, rough, or smooth edges. The fruit of an oak tree is the acorn—a round nut in a woody cup. New oaks can grow easily from acorns.

The English oak is the largest of the oak trees. Some oaks in England are more than 800 years old. The English oak has sturdy limbs and a stout body. The zig-zag growth of the limbs in older trees gives them a twisted look.

The white oak is common in the United States. The leaves are light green above and whitish beneath. In autumn the leaves turn deep violet. They cling to the tree throughout the winter. They fall just before new leaves appear.

Oaks have many uses. The wood of many types of oak is valued in carpentry and building. Cork comes from the bark of the cork oak. Some oaks are grown to decorate gardens. Some small animals eat acorns.

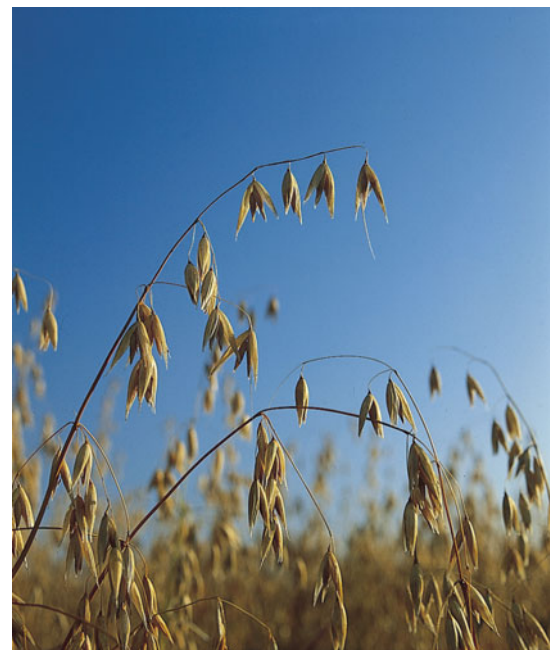
► More to explore

Cork • Tree

Oats

Oats are a grain that is grown throughout the world. Grains are grasses that produce seeds that can be eaten. Russia and Canada are leading oat-producing countries. The scientific name of the oat plant is *Avena sativa*.

Oat plants grow to about 2 to 5 feet (0.6 to 1.5 meters) tall. A plant usually produces more than one stem. The oats are seeds, or kernels, that grow on little



People and animals eat the nutritious seeds called oats.

branches at the end of each stem. One plant can produce dozens of kernels.

Oats are used mostly to feed farm animals. Farmers make straw from the parts of the plants that the animals do not eat. Oat straw is used as animal bedding.

People eat oats in the form of rolled oats and oat flour. Rolled oats are made from oat grains that have been steamed and flattened between rollers. They are cooked in water to make oatmeal. They are also used in breads, cookies, and other products. Oat flour is often mixed with wheat flour and used in breakfast cereals and baked goods. Oat bran, the outer covering of the oat kernel, is full of nutrients.

► More to explore

Grain • Grass

Obama, Barack

Barack Obama was the first African American to be elected president of the United States. In 2008 he defeated John McCain to become the country's 44th president.

Early Life

Barack Hussein Obama II was born on August 4, 1961, in Honolulu, Hawaii. His parents had met while they were both students at the University of Hawaii. His mother, who was white, came from Kansas; his father, Barack Obama, Sr., was from Kenya. When young Barack was 2 years old, his parents divorced. His father eventually returned to Kenya. His mother later



Barack Obama was the 44th president of the United States.

married a man from Indonesia, and Barack lived in Indonesia between the ages of 6 and 10. He then returned to Hawaii and lived with his mother's parents.

Education and Early Career

Obama graduated from Columbia University in New York in 1983. He then moved to Chicago and worked for a group helping low-income people on the city's South Side. After three years there, he entered Harvard Law School. He graduated with honors in 1991. Obama returned to Chicago to practice law. He worked on issues of civil rights. He also taught law at the University of Chicago.

Political Career

During this period Obama became active in the Democratic Party. In 1996 he was elected to the Illinois Senate. In 2004 he was elected to the U.S. Senate from Illinois. Obama quickly became a major figure in his party.

In 2007 he decided to run for president of the United States. He ran against several people, including Hillary Clinton, in the primary elections. In primary elections voters elect delegates to go to a convention in the summer. The delegates are supporters of a candidate. They vote at a national convention to choose the person who will be the candidate for the party in the general election in November. Both Obama and Clinton won many delegates, but Obama won the most delegates. At the convention in August the delegates chose Obama to be the candidate for the Democrats. Obama chose Senator Joseph Biden to be his running mate.

Obama sought to bring people of many backgrounds together to improve the lives of everyone in the country. One of the major issues during the campaign was the ongoing war in Iraq. The United States and other countries had invaded that country in 2003. Obama had spoken out against the war before it started.

Obama was also concerned about making health care available to everyone in the United States.

In the fall of 2008 the U.S. economy began to fall apart. Many people faced serious troubles. They were unhappy with the government of President George Bush because of that. They were also unhappy about the ongoing war in Iraq. Both issues became important in the campaign for president. Obama offered the voters a change. His opponent, John McCain, was associated with Bush because they were both Republicans. On November 4 the voters chose Obama over McCain.

Obama wrote several books about his life and his views on major issues of the day. His books include *Dreams from My Father* (1995) and *The Audacity of Hope* (2006).

► **More to explore**
United States



TIMELINE

Obama is born in Honolulu, Hawaii.

August 4, 1961

Obama graduates from Columbia University.

1983

Obama becomes a community organizer in Chicago.

1985

Obama graduates from Harvard Law School.

1991

Obama is elected to the Illinois Senate.

1996

Obama is elected to the U.S. Senate.

2004

Obama is elected president.

2008

Ocean

An ocean is a huge body of salt water. Oceans cover nearly 71 percent of Earth's surface. They contain almost 98 percent of all the water on Earth.

There are four main oceans on Earth: the Pacific, the Atlantic, the Indian, and the Arctic. These oceans have no real borders, and water flows freely between them. Smaller parts of these oceans are called seas, gulfs, and bays.

Ocean Water

Ocean water is salty. The saltiness comes from a chemical substance called sodium chloride, which is dissolved in the water. (The salt that people eat is sodium chloride in the form of crystals.)

Winds and other forces cause ocean water to move around Earth in patterns called currents. Ocean currents may be

warm or cold. Warm currents tend to bring warm weather and rain to nearby land. Cold currents tend to cause a dry climate. The Gulf Stream is a warm current that runs north along the eastern coast of the United States.

Winds also cause ocean water to move in waves. Steady, powerful winds cause big waves. Gentle breezes create ripples. Large swells in ocean water usually come from stormy weather. Earthquakes or other forces cause the huge, destructive waves called tsunamis.

Tides are another way that ocean water moves. Tides are the rise and fall of ocean levels. This happens throughout the day. On a beach, for example, the ocean covers more sand at high tide than at low tide. The pull of a force called gravity between Earth and the Moon and the sun causes tides.



The four major oceans cover most of Earth's surface.

Ocean Floor

The ocean floor has many levels. The shallowest part of the oceans, called the continental shelf, lies along the edges of the continents. The edges of the continental shelf slope down toward the deep parts of the oceans, called the basins. At the bottom of the basins are large, flat plains.

In some places, deep cracks called trenches cut into the ocean floor. In other places, underwater mountain chains, called oceanic ridges, rise up from the floor. Earthquakes sometimes occur along the trenches and ridges. Parts of the ridges contain active volcanoes.

Ocean Life

Living things inhabit all levels of Earth's oceans. Ocean plants grow fairly close to the water's surface because they need sunlight to stay alive. Sunlight penetrates the water to only about 650 feet (200 meters). The most numerous ocean plants are called phytoplankton. These tiny, one-celled plants drift with the ocean currents. Various kinds of sea grass and other plants also grow in the world's oceans. Seaweeds, which are plantlike forms of algae, are plentiful as well.

Like ocean plants, most ocean animals live in shallower water. This is because there are more plants and animals to eat near the water's surface. But animals also can be found in deep water, including within the oceans' deepest, darkest trenches.

The largest ocean animal is the blue whale. No larger animal has ever lived



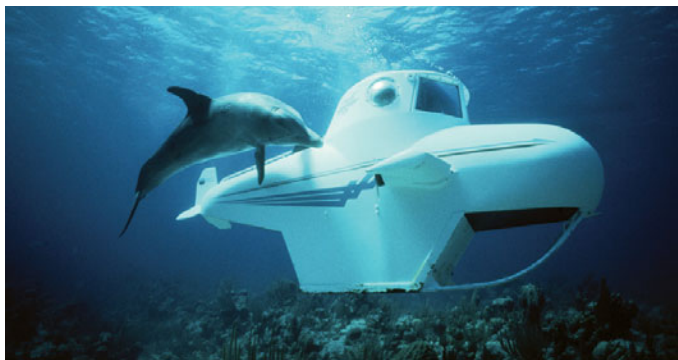
Tube worms grow near a vent, or opening in the seafloor.

on Earth. The tiniest animals are a form of plankton called zooplankton. Hundreds of thousands of other types of animal also live in the ocean. These include clams, crabs, squid, dolphins, and many different kinds of fish.

Importance of the Oceans

The world's oceans are important to life on Earth. Oceans are a great source of food for people around the world. They also provide minerals, oil, and natural gas. Phytoplankton and algae create much of the world's oxygen. Oceans also help to keep climates stable by storing heat from the sun.

Today many dangers threaten the health of the oceans. People pollute oceans by dumping poisonous waste and garbage into them. Ocean pollution reduces oxygen in the water and harms ocean life. Overfishing and oil spills harm ocean life as well.



Some oceanographers use small submarines to study the plants and animals in oceans.

People called oceanographers study the oceans to try to keep them healthy. Some examine the quality of the water and the way the water moves. Others look at the structures of the seafloors and basins. Others are interested in the plants and animals that live in oceans.

► More to explore

Arctic Ocean • Atlantic Ocean • Earth
• Indian Ocean • Pacific Ocean • Tide
• Tsunami • Water

Oceania

Thousands of islands scattered across the Pacific Ocean are grouped together under the name of Oceania. The region is generally divided into three major areas: Melanesia, Micronesia, and Polynesia. Sometimes a fourth area, called Australasia, is also considered to be a part of Oceania. This area includes Australia, New Zealand, and nearby islands.

Land and Climate

Although they lie in a vast expanse of ocean, the islands of Oceania take up a relatively tiny amount of land. Not

counting New Zealand, New Guinea, and Australia, their combined land area is only about 42,000 square miles (109,000 square kilometers).

Melanesia

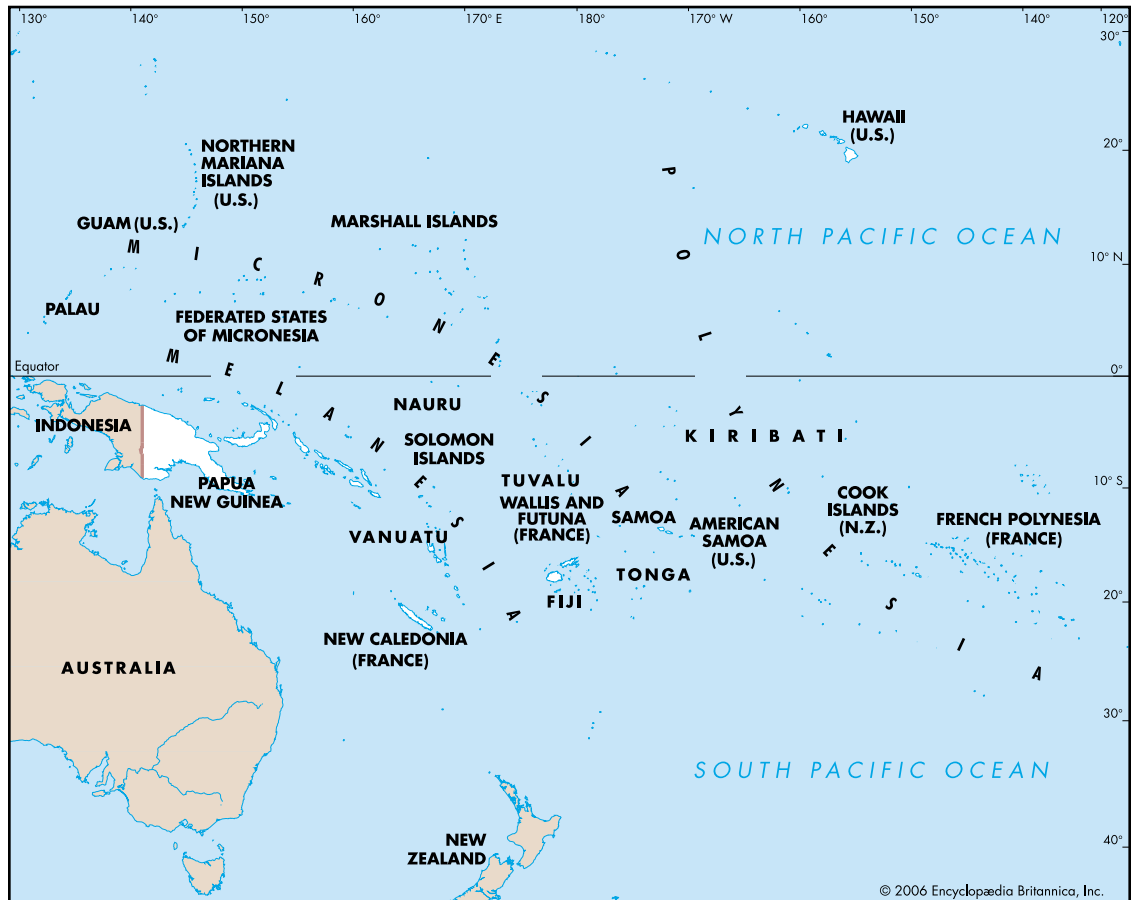
The islands of Melanesia lie north and east of Australia. Melanesia includes the countries of Papua New Guinea, the Solomon Islands, Vanuatu, and Fiji. It also includes the French territory of New Caledonia. The name Melanesia means “black islands.” Europeans gave the islands this name because many of the people who live there have dark skin.

Micronesia

East of the Philippines and mostly north of the equator are the islands of Micronesia. Micronesia means “small islands.” The region stretches from the country of Palau in the west to the country of Kiribati in the east. Other Micronesian countries are the Federated States of Micronesia, the Marshall Islands, and Nauru. The area also includes Guam, which is a U.S. territory and a part of the Mariana Islands.



Many islands in Oceania have warm weather and sandy beaches. These features attract tourists from around the world.



Polynesia

The islands of Polynesia lie generally east of Micronesia and Melanesia. Polynesia means “many islands.” Polynesia includes the countries of Samoa, Tonga, and Tuvalu. Other Polynesian islands include Hawaii (a U.S. state); American Samoa (a U.S. territory); the Cook Islands (associated with New Zealand); Easter Island (ruled by Chile); and French Polynesia and Wallis and Futuna (territories of France).

Climate

As a tropical region, Oceania has mostly warm weather with very little temperature change from season to season. Many parts of the western Pacific receive more than 80 inches (200 centimeters)

of rain each year. When humidity is high, strong circular storms called typhoons can develop over water. (The same kind of storm is known as a hurricane in the Atlantic Ocean.)

Plants and Animals

The native plants of most islands in Oceania grew originally in Asia. They spread eastward by way of Indonesia and New Guinea. Islands close to the mainland tend to have more kinds of plants than islands far out to sea. Shrubs, vines, and coconut palms are found near the coasts, and mangroves grow in salt marshes. Banana trees, breadfruit trees, and papaya plants grow farther inland. Rain forests are a feature of many high islands.

Ducks and seabirds, such as frigate birds, albatrosses, and boobies, live throughout Oceania. Most islands have some snakes and lizards. Reefs and lagoons shelter many kinds of fish as well as lobsters, shrimps, snails, eels, octopuses, and turtles. Bigger fish, such as swordfish and marlins, lurk in deeper waters, as do whales, porpoises, and sharks.

People

In all the areas of Oceania (not including Australia), there were only about 12 million people at the start of the 21st century. The country with the most people is Papua New Guinea. New Zealand, Hawaii, and Tonga also have large populations. Micronesia is the region with the fewest people.

The people of Oceania may be divided into Melanesians, Micronesians, and Polynesians, based on their area of origin. However, within these groups are many smaller groups of people that speak hundreds of different languages. Many people follow traditional beliefs, but Christianity is also an important religion.

Most people in Oceania live in villages, where they farm or fish for a living. Outside Australia and New Zealand, the only really big city in Oceania is Honolulu, Hawaii.

Economy

All three regions of Oceania produce coconut products like copra (dried coconut meat) and coconut oil. They sell these products to the rest of the world in large quantities. Fish and other sea creatures are also important to the economy. Farmers grow sugarcane in Fiji and Hawaii. On the Solomon Islands and Vanuatu, people harvest timber. Gold and oil are found in Papua New Guinea, while New Caledonia has nickel mines. Tourism is an important source of money in many areas.

History

Melanesia was the first region of Oceania to be settled. Speakers of Papuan languages may have occupied New Guinea, which was then joined to Australia, as early as 50,000 years ago. Papuan peoples became farmers as early as 9,000 years ago. They grew sugarcane and root crops.

Did You Know?

One of the wettest places on Earth's surface is Mount Waialeale on Kauai Island, Hawaii, which gets about 460 inches (1,168 centimeters) of rain per year.



Dancers perform in a cultural show in Papua New Guinea, which is part of the region called Oceania. They wear costumes and face paint that are traditional to their ethnic group. Papua New Guinea has hundreds of different ethnic groups.



Easter Island, in Polynesia, is known for the large stone statues that were carved there hundreds of years ago.

Seagoing people, known as the Lapita, moved into the areas north of New Guinea about 4,000 years ago. The Lapita were probably from Southeast Asia. Over hundreds of years they settled Polynesia and Micronesia. The Polynesian Maori people reached New Zealand in about AD 800. By this time, settlement of the Pacific islands was just about complete.

In 1521 the Portuguese explorer Ferdinand Magellan became the first European to sail through Oceania. Spanish, Dutch, and English voyagers followed. The English explorer James Cook traveled throughout the region in the 1700s.

In the 1800s France, Great Britain, Germany, and the United States claimed parts of Oceania. These areas, known as colonies, stayed under foreign control until the 1900s. Many island groups gained independence after 1962. However, foreign countries still control some parts of Oceania.

► More to explore

Cook, James • French Polynesia
• Hawaii • Maori • Micronesia,
Federated States of • Pacific Ocean
• Papua New Guinea • Solomon Islands

Ocelot

The ocelot is a spotted cat of the Americas. It is found in tropical forests and grasslands from the U.S. state of Texas to Argentina. The scientific name of the ocelot is *Leopardus pardalis*.

The ocelot is a slender animal. An adult is about 28 to 35 inches (71 to 89 centimeters) long, not including the tail. It weighs about 25 to 35 pounds (11 to 16 kilograms). Females are usually smaller than males.

The ocelot has short, smooth fur. It is yellowish with long, black-edged spots. There are small black spots on the head, two black stripes on each cheek, and



The ocelot is a wild cat that lives in parts of North and South America.

black stripes along the neck. The underside of the body is white with black spots.

The ocelot hunts mainly at night. It eats rodents, birds, reptiles, and fish. It stays mostly on the ground. But it also is a good climber, and it can swim.

About 70 days after mating, a female ocelot gives birth to two or three young. The babies are darker than the adults but have a similar coat pattern. The mother cares for her kittens in a den.

People capture ocelots for their fur and to sell as pets. As a result the ocelot has declined in number. Ocelot hunting is banned in the United States and other countries.

► More to explore

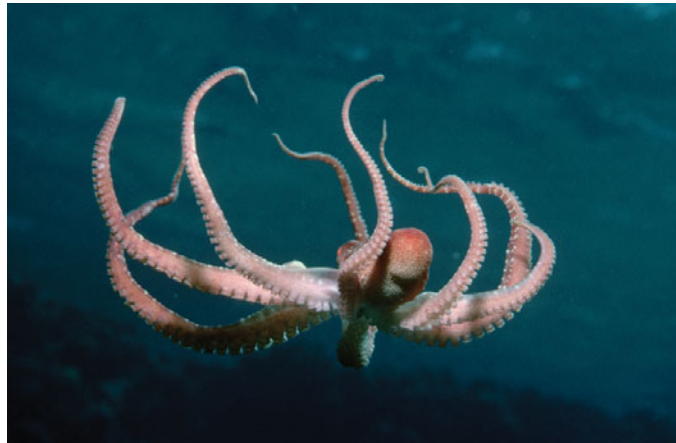
Cat

Octopus

An octopus is a sea animal with eight arms. There are more than 150 species, or types, of octopus. They belong to the group of animals called mollusks, which also includes squid, clams, and oysters. Octopuses live in seas throughout the world.

An octopus has a soft, baglike body and large eyes. Its long, slender arms reach out in all directions. Each arm has two rows of cuplike suckers with great holding power.

Octopuses vary greatly in size. The smallest are only about 2 inches (5 centi-



An octopus swims near the surface of the water.

meters) long. The largest may be 18 feet (5.5 meters) long and have a 30-foot (9-meter) arm span.

An octopus can change color quickly depending on its surroundings or its mood. It can be gray, brown, pink, blue, green, or even an angry red if it is suddenly frightened.

An octopus usually crawls along the ocean bottom on its arms searching for food. It eats mainly crabs and lobsters. Skillful hunters, octopuses also attack large prey such as sharks. If an octopus is in danger, it shoots a jet of water out of its body. This moves the octopus backward very quickly. An octopus also may release an inky fluid to darken the water and confuse an enemy.

A female octopus lays her eggs under rocks or in holes. She guards the eggs for four to eight weeks. Upon hatching, the young drift for several weeks before going to the ocean bottom.

► More to explore

Mollusk • Squid

Odin

Odin was one of the chief gods of the early people of Scandinavia in northern Europe. In their mythology (called



In Norse mythology, Odin was one of the chief gods. He protected warriors and poets.

Norse mythology), they imagined Odin as an old man with a gray beard and only one eye. He gave up the other eye in exchange for wisdom. Other names for Odin include Wotan and Woden. Wednesday (“Woden’s day”) is named for him.

Odin was the god of warriors and poets. He was also a magician. His magical spear always hit its target. In addition, Odin was important in Norse myths about creation. He and his two brothers were said to have made the first human beings, Ask and Embla. The gods created the humans from tree trunks found on the seashore.

Odin’s wife was Frigg, the goddess of marriage. Thor, the god of thunder, was Odin’s son. Odin’s daughters included the Valkyries. The Valkyries met fallen heroes on the battlefield. They brought the dead heroes to stay at a grand banquet hall called Valhalla. Valhalla was like a heaven for warriors.

According to legend, Odin had two ravens, named Thought and Memory. Each day he would send the birds out into the world. When they returned, they would tell Odin all they had seen. For that reason Odin was called the raven god. Odin also had a magical horse, called Sleipnir. It had eight legs and could gallop through the sky and across the sea. Two wolves, named Geri and Freki, followed Odin as well.

► **More to explore**
Mythology • Valhalla

Ohio

The U.S. state of Ohio was named after its local river. The name of both the Ohio River and the state comes from the Iroquois Indian word meaning “great river.” Ohio’s location makes it an important transportation crossroads between the Eastern states and the Midwest. Throughout the state’s history, cargo and passengers have been carried by way of Lake Erie and the Ohio River.

Ohio is nicknamed the Buckeye State after a tree found throughout Ohio. Columbus is the capital of the state.

Geography

Ohio is in the north-central part of the United States. It is bordered on the east by Pennsylvania, on the north by Michigan and Lake Erie, and on the west by

Indiana. The Ohio River in the south separates Ohio from West Virginia and Kentucky.



Ohio has three natural regions. The eastern half of the state is part of the Appalachian plateau. Western Ohio is a gently rolling plains region known for its soil that is good for growing crops. The lake plains stretch along the southern shore of Lake Erie. Ohio has warm summers and cool winters.

People

Many of Ohio’s earliest white settlers came from the Eastern states. Today about 85 percent of the state’s population is white. African Americans represent about 12 percent of the population and are Ohio’s largest minority group. Asians and Hispanics together make up less than 4 percent of the population.

Economy

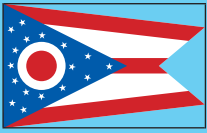
For many years manufacturing has been the most important part of Ohio’s economy. Many workers are involved in making motor vehicles, metal products, and other goods. Ohio has a long history in manufacturing rubber automobile tires.

Like many other states, however, Ohio became more dependent on service-oriented industries in the late 20th century. Health care, business services, and finance were among the industries that expanded during this period. Farming plays a small but important role in the



Facts About OHIO

Flag



Population

(2000 census)
11,353,140—
rank, 7th state;
(2008 estimate)
11,485,910—
rank, 7th state

Capital

Columbus

Area

44,825 sq mi
(116,096 sq
km)—rank, 34th
state

Statehood

March 1, 1803

Motto

With God, All
Things Are
Possible

State bird

Cardinal



State flower

Scarlet carnation



state's economy. The chief agricultural crops are soybeans and corn.

History

People have lived in the Ohio area for thousands of years. Southern Ohio was the home of two famous prehistoric Native American groups—the Adena and Hopewell cultures. Both groups vanished before AD 500, but they left behind many large earth mounds. Other Native American groups took their place.

Historians believe that the French explorer Sieur de La Salle reached the area in 1669. The French claimed the Ohio territory two years later. In 1763 the land passed from France to Great Britain. The area became part of the United States after the American Revolution (1775–83). It was included in the region known as the Northwest Territory in 1787.

The arrival of white settlers led to conflict with the Native Americans in the region. The fighting ended with the defeat of the Indians in the battle of Fallen Timbers in 1794. With the fighting over, settlements sprang up throughout the region. Ohio became the nation's 17th state in 1803.

Improved transportation helped the state grow. In the 1830s the Ohio and Erie Canal, the Cumberland Road, and the first horse-drawn railroad were completed. By 1850 Ohio was the third most populous state in the nation. Ohio stayed in the Union during the American Civil War (1861–65).



About half of Ohio's land is used for farming.

A waterway called the Saint Lawrence Seaway opened up the Great Lakes to oceangoing ships. Cleveland, Toledo, and other cities on Lake Erie became seaports after the seaway was completed in 1959.

Cleveland and other industrial cities struggled economically near the end of the 1900s. One bright spot for Cleveland was the opening of the Rock and Roll Hall of Fame and Museum in 1995.

► More to explore

Columbus



The Rock and Roll Hall of Fame and Museum sits on the shore of Lake Erie in Cleveland, Ohio.

Ohio River

The Ohio River begins at Pittsburgh, Pennsylvania, where the Allegheny and Monongahela rivers come together. It flows northwest out of Pennsylvania and then turns southwest to join the Mississippi River in Illinois. It is 981 miles (1,579 kilometers) long.

The Ohio River forms the state borders between Ohio and West Virginia; Ohio and Kentucky; Indiana and Kentucky; and Illinois and Kentucky. The longest river that feeds into the Ohio is the Tennessee River, which begins in the Appalachian Mountains. The Tennessee River flows into the Ohio at Paducah, Kentucky.

The Ohio serves such large cities as Pittsburgh; Cincinnati, Ohio; and Louisville, Kentucky. These cities and others use the river to transport coal, oil, steel, and many manufactured goods.

The French explorer known as the Sieur de La Salle is said to have been the first European to see the Ohio River. He reached it in 1669. By 1763 the British controlled the river. The United States



The Ohio River joins the Mississippi River at Cairo, Illinois.

gained control of the land around the river when they defeated the British in the American Revolution.

► More to explore

La Salle, Sieur de • Mississippi River

Ojibwa

The Ojibwa are Native Americans of the northern United States and southern Canada. Their land once spread all the way from the northern Great Lakes to what is now Montana. The Ojibwa in the United States are often called the Chippewa. In certain parts of Canada the Ojibwa are called the Mississauga or the Saulteaux. Many Ojibwa prefer to be called Anishinabe, which means “first people.”

The Ojibwa traditionally grew corn, beans, pumpkins, and squash. They also hunted and fished and gathered wild plant foods. They lived in dome-shaped houses made from wood and birch bark.





A photograph from the 1800s shows Ojibwa with their weapons.

Long ago the Ojibwa were part of a larger group that also included the Ottawa and the Potawatomi. French explorers arrived on Ojibwa lands in 1622. The Ojibwa traded with the French and helped them in war.

In the 1880s the Ojibwa had to give up much of their land and move to small reservations. In the late 20th century there were more than 100,000 Ojibwa in the United States. Many lived on reservations in Michigan, Wisconsin, Minnesota, North Dakota, and Montana. Thousands more Ojibwa lived in Canada. They had land in the provinces of Ontario, Manitoba, and Saskatchewan.

► More to explore

Native Americans

Okefenokee Swamp

The Okefenokee Swamp is a large wetland in the southeastern United States.

It is an important wildlife refuge. This means that animals and plants that live there are protected.

The Okefenokee Swamp is in southeastern Georgia and northeastern Florida. The swamp is part of an area that was at the bottom of an ocean a long time ago. It is now filled with lakes and floating islands of peat. Peat is a type of soil made when dead plants build up in layers. The peat islands have trees and plants. The trees of the swamp include giant tupelos and bald cypresses. Some of the trees in the swamp are 900 years old. The swamp also has grassy areas.

The swamp is home to many animals, including birds, alligators, deer, foxes, otters, and bears. Many of the animals that live in the swamp are endangered. This means that they are in danger of dying out forever.

Native Americans once lived in the swamp. Later people cut down many of the swamp's trees to build houses and other structures. Today, the government protects the swamp.



► More to explore

Swamp • Wetland

Oklahoma

The U.S. state of Oklahoma took its name from the Choctaw Indian words meaning “red people.” For much of the 1800s Oklahoma was Indian Territory—land set aside by the U.S. government for Native Americans. In 1889, however, the land was opened to white settlement. The nickname Sooner State came from settlers claiming land in the territory sooner than the official opening date. The state capital is Oklahoma City.

Geography

Oklahoma is in the south-central part of the United States. In the south the Red River separates Oklahoma from Texas. Texas also borders Oklahoma south of the Panhandle, a long, narrow stretch of land in the northwestern part of the state. East of Oklahoma are Arkansas and Missouri. Kansas and Colorado are to the north, and New Mexico is to the west.

Oklahoma is primarily a plains state. The central part of the state alternates between hill and plain. In the south is a mountainous region. To the northeast is the Ozark Plateau, an area of scenic but rough land. Oklahoma’s weather is normally pleasant. In the spring, however, the state can be hit by tornadoes.

People

About three fourths of all Oklahomans are whites of European heritage. African Americans and Native Americans make up about 8 percent each of Oklahoma’s

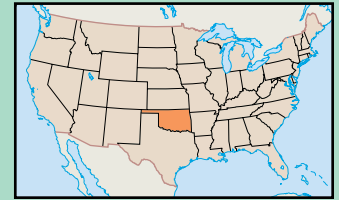
population. Oklahoma ranks third in the country—following Alaska and New Mexico—for the percentage of Native Americans in its population. About 5 percent of the people are Hispanic.

Economy

For much of Oklahoma’s history, petroleum (oil) and gas production have been a major part of the economy. In agriculture, the raising of cattle and calves is the biggest source of income. Manufacturing industries make processed foods, industrial machinery, and metal products. Oklahoma is a national leader in the aerospace industry. Service industries employ about two thirds of the workforce in jobs ranging from teachers to computer programmers to government workers.

History

Indian tribes such as the Caddo, Wichita, and Pawnee were living in the Oklahoma area when Europeans first arrived. The Spanish explorer Francisco Coronado claimed the area for his coun-



Facts About OKLAHOMA

Flag



Population

(2000 census)
3,450,654—
rank, 27th state;
(2008 estimate)
3,642,361—
rank, 28th state

Capital

Oklahoma City

Area

69,898 sq mi
(181,036 sq
km)—rank, 20th
state

Statehood

November 16,
1907

Motto

*Labor Omnia
Vincit* (Labor
Conquers All
Things)

State bird

Scissor-tailed
flycatcher



State flower

Mistletoe



try in 1541. Spain controlled the region until 1800, when it became French territory. In 1803 the United States acquired the region from France as part of the Louisiana Purchase.

In 1834 the U.S. Congress made the Oklahoma area Indian Territory and required all whites to leave. During the 1830s the U.S. government forced five tribes from the Southeast—the Choctaw, Creek, Chickasaw, Seminole, and Cherokee peoples—to move to Indian Territory. The Cherokee's difficult trip from their homeland to Indian Territory became known as the Trail of Tears. By 1880 more than 60 tribes had moved to Indian Territory.

Eventually people began to ask Congress to open the Indian Territory to white settlers. Congress purchased land in the



A young Comanche boy is pictured wearing traditional clothing at a Native American celebration in Medicine Park, Oklahoma.



Gloss Mountain State Park in Oklahoma is known for its red buttes, or flat-topped hills.

central part of what is now Oklahoma. This area, named Oklahoma Territory, was opened to new settlement on April 22, 1889. Settlers rushed into the area to claim the free land.

Oklahoma was admitted to the Union as the 46th state in 1907. During the 1930s a severe drought hit Oklahoma and other neighboring states. The drought-stricken areas became known as the Dust Bowl because the land became so dry that the soil was blown away. The drought ended by the early 1940s. Oklahoma's economy improved during World War II (1939–45) and the post-war period.

On April 19, 1995, Oklahoma City was the site of one of the worst terrorist attacks in U.S. history. A powerful homemade bomb heavily damaged the Alfred P. Murrah Federal Building. Hundreds of people in the building were either killed or injured.

► More to explore

Dust Bowl • Oklahoma City

Oklahoma City



Population
(2000 census),
city, 506,132;
(2007 estimate)
547,274

Oklahoma City is the capital of the U.S. state of Oklahoma. The city lies on the North Canadian River.

Many industries related to oil and airplanes are located in Oklahoma City. Oil is both drilled and processed in the city. Oklahoma City is home to a U.S. Air Force base and a large government air center. Factories in Oklahoma City make airplanes, electronics, machinery, and steel.

Many people in Oklahoma City work for the government. Education, health care, and other service industries also bring money to the city. Oklahoma City

has long been a center for the sale and transport of cattle.

Oklahoma City began in 1889. In that year about 10,000 settlers claimed available land around a railway station. The city became the capital of Oklahoma in 1910. It grew rapidly after oil was discovered there in 1928.

In 1995 two men who were angry with the U.S. government bombed the Alfred P. Murrah Federal Building in Oklahoma City. The terrorist bombing killed 168 people and injured more than 500 others.

► More to explore

Oklahoma

Olive

Since ancient times people have grown olive trees for their fruit and the oil it contains. For the ancient Greeks an olive branch loaded with fruit was a symbol of peace.

People on the Greek island of Crete grew olive trees as far back as 3500 BC. Later other countries along the Mediterranean Sea also began growing olives. Today olive trees are found in many parts of the world.

Olive trees have long been admired for their beauty. Their leaves are dark green on top and silvery on the underside. The olive tree has a twisted trunk. Most olive trees are 10 to 40 feet (3 to 12 meters) tall or more.

Did You Know?

Ancient people cooked with olive oil, burned it in lamps, and used it in ceremonies.



The Oklahoma City National Memorial honors those killed in a terrorist bombing in 1995. The memorial includes 168 chairs to represent the 168 people who died.



Olives cannot be eaten fresh from the tree because they are too bitter. Many olives are processed so they can be eaten. Others are pressed to make oil.

Olive trees bloom in late spring. Some of their small, white flowers grow into the olive fruits. Inside the fruit is a stone. It holds one or two seeds.

Olives are often picked when they are still unripe and green colored. Fresh olives are very bitter. They must be processed, or treated with salt or other chemicals, before they can be eaten. Most olives are grown to make olive oil. Olives and olive oil are used in many dishes from the Mediterranean area.

Olmec

The Olmec Indians developed the first major civilization in what is now Mexico. It lasted from about 1200 to 400 BC.

The Olmec lived in hot, humid lands along the coast of the Gulf of Mexico. This land is now in southern Mexico. The Olmec built cities where they came together to trade and perform ceremonies. Farmers lived outside the cities. Corn was their main crop.

The Olmec had many achievements. They developed a number system, a calendar, and a system of picture writing. They made pottery and small jade sculptures. They traded these items with other Indians.

The Olmec are known for having carved huge heads from basalt, a type of volcanic rock. These sculptures were up to 10 feet (3 meters) tall and weighed up to 20 tons.

Historians do not know for sure what happened to the Olmec. Other Indians might have invaded and wiped out the Olmec. Or the Olmec might have suffered from crop failures or disease. Later Indians of Mexico and Central America kept some Olmec customs. These Indians included the Maya, the Toltec, and the Aztec.

► More to explore

Aztec • Maya • Native Americans
• Toltec



The Olmec people carved huge heads out of volcanic rock.

Olympia



Population
(2000 census),
city, 42,514;
(2007 estimate)
44,925

Olympia is the capital of the U.S. state of Washington. The city is surrounded by beautiful scenery. It lies at the end of Puget Sound, an inlet of the Pacific Ocean. The Olympic Mountains and Olympic National Forest are nearby.

Many people in Olympia work for the government. The city is a seaport. Shipping goods through the port is important to the city's economy. Tourism also brings money to Olympia. Factories in the city process wood, metal, and foods.

A settler named Edmund Sylvester founded the town in the mid-1800s. In 1853 the Washington Territory was formed. Olympia was its capital. In 1889 Washington became a U.S. state with Olympia as the state capital.

► More to explore

Washington

Olympic Games

The Olympic Games are the world's leading sports event. Athletes from more than 200 countries compete in them. The Olympics include the Summer Games and the Winter Games. Each is held in a different country once every

four years. Until the early 1990s the Summer and Winter Games were held in the same year. Today they are separated by two years.

Organization and Flag

The International Olympic Committee (IOC) governs the Games. The IOC decides on the sports to include in the Olympics. It also chooses the cities that will host the Games. In addition to the IOC, each country has its own national Olympic committee.

The flag of the Olympic Games has five linked rings on a white background. The rings represent the five parts of the world joined together by the Games: the Americas, Europe, Asia, Africa, and Australia. The rings are blue, yellow, black, green, and red. The colors of the rings and the white background came from national flags. At least one of the colors appears in every country's flag.

Events

The Summer Games and the Winter Games include different sports that fit the different seasons. There are individual and team events for men and for women. Some events are held indoors, others outdoors.

The Summer Games have a wider variety of events than the Winter Games. The most popular events at the Summer Games include gymnastics, swimming, and track and field. Other events include baseball, basketball, boxing, cycling, diving, judo, sailing, soccer, softball, volleyball, water polo, weight lifting, and wrestling.

Did You Know?

World Wars I and II interrupted the Olympic Games. There were no Games in 1916, 1940, or 1944.

Ice skating and skiing are crowd favorites at the Winter Olympics. Skating events include graceful figure-skating competitions as well as speed-skating races. Ice hockey is a popular team event. The biathlon combines skiing and shooting. The Winter Games also include high-speed races on sleds called bobsleds and luges.

The list of Olympic events can change. Sometimes popular new sports are added to the Games. In the late 20th century, for example, mountain biking, beach volleyball, and windsurfing became events at the Summer Games. Snowboarding was added to the Winter Games.

A victory ceremony is held during the Games after the end of each event. Medals are awarded for first, second, and third place. In order from first to third, the medals are gold, silver, and bronze. The flags of the winners' countries are raised while the national anthem of the gold medal winner is played.



A big ceremony marks the end of the 2006 Winter Olympics in Turin, Italy.



Footraces of various distances are important parts of the Summer Olympics.

History

The first Olympic Games for which there are written records took place in Greece in 776 BC. The ancient Games continued until a Roman emperor stopped them in AD 393.

For the next 1,500 years there were no Olympics. In the late 1800s a Frenchman named Pierre de Coubertin worked to revive them. The first modern Olympic Games were held in 1896 in Athens, Greece. At those Games a Greek shepherd named Spyridon Louis became a national hero when he won a new race called the marathon. The first Winter Games were held in 1924.

For about 80 years only amateur athletes were allowed to take part in the Games. Amateur athletes are not paid. But since the 1970s professional athletes have been allowed to compete in many Olympic events.

► More to explore

Marathon • Track and Field

Olympus, Mount



The highest mountain peak in Greece is Mount Olympus. It reaches a height of 9,570 feet (2,917 meters) above sea level. Mount Olympus is on the border of the Greek regions of Macedonia and Thessaly.

The ancient Greeks believed that their gods lived on Mount Olympus. From that height the gods were thought to watch over and take part in the lives of humans.

Omaha

The Omaha are Native Americans who live in Nebraska. The city of Omaha is named after the tribe.

The Omaha lived in earth lodges. They made these homes by covering a dome-shaped wooden frame with mud. The Omaha grew corn, beans, squash, and other vegetables. They also fished and hunted. They left their villages twice a year to hunt bison (buffalo). While hunting they lived in tents called tepees, which they covered with bison hides.

The Omaha were once part of a larger group that lived in what is now the eastern United States. The group also included the Osage, the Kaw, the Quapaw, and the Ponca. The group eventually moved west and split up. In the mid-1600s the Omaha settled along the Missouri River in what is now Nebraska.

The Omaha generally lived in peace with white settlers who came to their territory. However, the settlers brought smallpox and other diseases that killed many Omaha.

In 1854 the Omaha sold most of their land to the U.S. government. They settled on a reservation in Nebraska. At the end of the 20th century there were more than 4,000 Omaha.



An Omaha man shows the traditional Omaha style of clothing.

► More to explore

Kaw • Native Americans • Osage
• Ponca • Quapaw



Oman

The country of Oman is an Arab sultanate, or monarchy, in the Middle East. The capital is Muscat.

Geography

Oman is on the Arabian Peninsula. It borders Yemen, Saudi Arabia, and the United Arab Emirates. The Arabian Sea lies to the east, and the Gulf of Oman lies to the north. A small part of Oman sits north of the United Arab Emirates.

Oman is hot and dry. A rocky desert covers most of the country. The northeast and southwest are the only humid areas. Mountains rise near the coasts. There are no rivers or lakes.

Plants and Animals

Few plants besides acacia trees grow in the dry regions. Tropical plants grow in the humid southwest. Oman's rare animals include Arabian oryx (a type of antelope) and Arabian leopards.



Houses are close to the water in a town in Oman.

People

Most of the people of Oman are Arabs. Arabic is the main language. Islam is the national religion.

Economy

Oman's economy depends on the sale of oil and natural gas to other countries. Oman also produces metals, cement, chemicals, and food products. The country's few crops include dates, bananas, and watermelons. Livestock includes cattle, goats, sheep, and camels. Fishing is another source of food.

History

Arabs first moved to Oman in the 800s BC. Sultans, or kings, began to rule the coastal areas in AD 1154. Omanis later used the sea to trade with countries as far away as China. The Al Bu Sa'id family took power in the mid-1700s. In the early 21st century a sultan from the family still ruled Oman.

► More to explore

Arabs • Muscat

Facts About OMAN



Population
(2008 estimate)
2,651,000

Area
119,500 sq mi
(309,500 sq km)

Capital
Muscat

Form of government
Monarchy

Major cities
As-Sib, Salalah,
Matrah, Bawshar,
Suhar

Oneida

The Oneida were the smallest of the five original Native American tribes of the Iroquois Confederacy. The confederacy was an alliance of tribes that lived in upper New York State and spoke similar languages. The Oneida traditionally lived east of what is now the city of Syracuse.

The Oneida lived in longhouses. Longhouses were large homes made of a wooden frame covered with bark. A longhouse could house as many as 30 people. The Oneida got most of their food by farming. They grew corn, beans, and squash. They also hunted deer and other animals.

The Oneida knew only other Native Americans until the early 1600s. At that time French explorers and traders came to their lands. The Europeans brought smallpox and other diseases that killed many Oneida.

During the American Revolution (1775–83), the Oneida served as guides and scouts for the American forces. After the war the Oneida signed a treaty with the American government. The treaty gave the Oneida rights to their homeland in New York. However, settlers ignored the treaty and took the land.

In the 1820s many Oneida moved to what is now Wisconsin. Others moved to Ontario, Canada. In the early 21st century there were more than 18,000 Oneida. About two thirds of them lived



The Oneida are skilled at weaving baskets.

in the United States. The rest lived in Canada.

► More to explore

Iroquois • Native Americans

Onion

The onion is a plant bulb made up of crisp, fleshy layers. Valued for its flavor, it may be cooked or eaten raw. The onion is an herb that belongs to the lily family. It is related to garlic, leeks, and chives. Its scientific name is *Allium cepa*.

Onions are grown in mild climates around the world. The plants have long, hollow leaves that look like stalks. The bulb forms at the bottom of the stalks, just under the soil. Onion bulbs vary in size, shape, color, and flavor. They range from less than 1 inch (2.5 centimeters) to more than 4.5 inches (11 centimeters) across. They are typically round or a little flattened. They may be white, yellow, or red.

Onions contain an oil that is rich in the mineral sulfur. This oil is released into



Onions come in many different colors and sizes.

the air when an onion is cut. The oil mixes with the fluid in a person's eyes, making the eyes tear.

► More to explore

Garlic • Herb • Lily

Onondaga

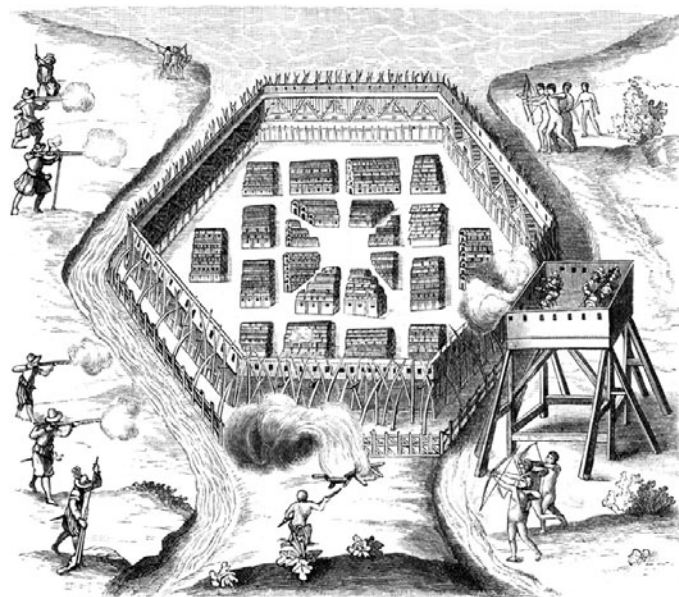
The Onondaga are a Native American people of New York State. They live near Onondaga Lake in central New York. The Onondaga were one of the five original tribes of the Iroquois Confederacy. The confederacy was an alliance of tribes who lived in the same area and spoke similar languages.

Like the other Iroquois, the Onondaga traditionally lived in longhouses. Longhouses were homes built from wood and bark. A longhouse was large enough to house several families. A village had about 20 to 50 longhouses. The Onondaga grew corn, beans, squash, sunflowers, and tobacco. They also hunted deer and other animals.

In the 1600s French traders arrived in Onondaga territory. During the French and Indian War (1754–63) the Onondaga helped the French fight against the British. During the American Revolution (1775–83) American troops attacked Onondaga villages. Then the tribe helped the British fight the Americans.

After the British lost the American Revolution, some Onondaga moved to Canada. Those who stayed behind had to give up most of their land. The Onondaga were left with only a small reservation near what is now the city of Syracuse, New York.

At the end of the 20th century there were about 3,000 Onondaga. About 2,000 lived in the United States, and about 1,000 lived in Canada.



An illustration shows the French attacking an Onondaga village in the early 1600s. The Onondaga built walls around some of their villages for protection.

► More to explore

Iroquois • Native Americans

Ontario

Ontario is the most populated province in Canada. A Native American word describing Lake Ontario likely gave the province its name. Ottawa, the capital of Canada, is in Ontario. The province's own capital is Toronto.

Geography

Ontario lies between the provinces of Quebec to the east and Manitoba to the west. Ontario is Canada's second largest province after Quebec.

The waters of Hudson Bay and James Bay lap Ontario's northern edge. The Great Lakes and the Saint Lawrence River form its southern boundary. Within Ontario, about 250,000 lakes and countless rivers and streams contain about one third of Earth's freshwater. The famous Niagara Falls lie on the border between Ontario and the United States.

Ontario is fairly flat. Swamps, meadows, and forests dot the northern parts of Ontario. Rich soils cover the southern areas of the province.

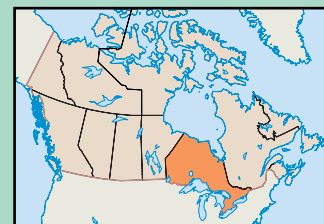
People

Many of Ontario's people have ancestors who came from Great Britain. Later immigrants came from other parts of Europe. A small population of black people have ancestors from the United States or the West Indies. There are also people with Asian or American Indian ancestry.

About 80 percent of Ontario's people live in or around its cities. Most of them live in southeastern Ontario, where Toronto, Ottawa, Hamilton, and Windsor are located. Toronto is the largest city in Ontario and the largest city in Canada. It is the center of Canada's business and cultural activities.

Economy

Ontario has a strong economy. Most people in Ontario work in financial, technical, and cultural services. Other important industries are car manufacturing, food processing, wood and paper products, and electronic products. The province's mines produce copper, zinc, gold, nickel, silver, platinum, and palla-





Skaters glide across the ice at an outdoor skating rink in Toronto. Toronto is the capital and largest city of Ontario, Canada.

dium. Ontario also has a large lumber industry in the north.

Most of the best farmland in Canada lies in Ontario, especially in the south. Farmers grow soybeans, corn, wheat, barley, and vegetables. They also raise poultry, hogs, and cattle. Apples are the leading fruit crop.

History

People have lived in what is now Ontario for at least 10,000 years. Among the early people were Indian hunters and fishers, including some Algonquian peoples, the Cree, and the Ojibwa in the north. Farming peoples in the south included the Wyandot (Huron), the Tionontati, the Attiwardon, and some Iroquois.

Europeans first explored the area in the early 1600s. Étienne Brûlé and Samuel de Champlain of France explored what are now the Ottawa River and Lake Ontario. Henry Hudson of England

explored what is now Hudson Bay in the north. In the late 1600s France built a fur trade in the region.

For more than a century France and Great Britain fought for control of territories in North America. In 1763 France lost its territories, including what is now Ontario, to Great Britain.

During and after the American Revolution many people moved north to what is now Ontario. Those people supported Great Britain, not the new United States. They also disagreed with the French-speaking settlers to the east.

In 1791 Great Britain divided its North American territory into Lower Canada and Upper Canada. Lower Canada, made up of mostly French speakers, later became Quebec. Upper Canada, made up of mostly English speakers, later became Ontario.

In 1867 Great Britain united its North American land to form the new country of Canada. The new Canadian government made Ontario a province. People flooded into Ontario from all parts of the world. During the 1950s alone, more than 100,000 people a year settled in Ontario.

► More to explore

Algonquian • American Revolution • Canada • Champlain, Samuel de • Cree • Fur Trade • Great Lakes • Hudson Bay • Iroquois • Ojibwa • Ottawa • Saint Lawrence River and Seaway • Wyandot

Facts About ONTARIO

Flag



Population
(2006 census)
12,160,282

Area
415,599 sq mi
(1,076,395 sq km)

Capital
Toronto

Motto
*Ut Incepit Fidelis
Sic Permanet*
(Loyal She Began,
Loyal She Remains)

When Ontario Became a Province
1867

Ontario, Lake



Lake Ontario is the smallest of the five Great Lakes of North America. It is also the farthest east. Lake Ontario forms part of the boundary between the United States and Canada. It is bordered on the north by the Canadian province of Ontario. The U.S. state of New York is to the south.

Lake Ontario covers 7,550 square miles (19,554 square kilometers). Its main source is the Niagara River. The Niagara River is the natural link between Lake Ontario and Lake Erie to the southwest.

The man-made Welland Canal also connects Lakes Ontario and Erie. It allows ships to avoid Niagara Falls. In the east Lake Ontario empties into the Saint Lawrence River.

The land north of Lake Ontario is good for farming. There are many industries in and around the cities of Toronto and Hamilton in Ontario and Rochester in New York. Shipping traffic is heavy because Lake Ontario is part of the Saint Lawrence Seaway. This system allows ships to travel between Great Lakes ports and the Atlantic Ocean.

► More to explore

Great Lakes • Saint Lawrence River and Seaway

OPEC

► see Organization of the Petroleum Exporting Countries.

Opera

Opera is a type of classical music. It is also a mix of several art forms. Like actors in the theater, opera singers act out a story on a stage. An orchestra plays the music. Opera often features ballet or other types of dance, too.

Most or all of the words in an opera are sung. When one person sings it is called a solo. A solo may be a complicated song, called an aria. Or a solo may be a simpler kind of sung speech. Small groups of singers or a large group called the chorus may sing other songs.

Did You Know?

Musical comedy, like opera, combines music with theater. Musical comedies of the 20th century include *The Sound of Music* and *Cats*.



People relax on a beach on the shore of Lake Ontario.



Opera singers perform in *The Barber of Seville*, an opera written by Gioacchino Rossini in the early 1800s.

Opera was invented in Italy in the late 1500s. The first opera was Jacopo Peri's *Dafne*. It was performed in 1597–98. This new musical style became popular throughout Europe.

Many famous operas were written in the 1700s and 1800s. Wolfgang Amadeus Mozart was an important opera composer, or writer, during the 1700s. One of his opera masterpieces is *The Marriage of Figaro*, which he wrote in 1786. Giuseppe Verdi was a great Italian opera composer of the 1800s. In the late 1800s German composer Richard Wagner wrote a series of four operas based on German legends. This famous series is called *The Ring of the Nibelung*.

In the 1900s opera grew and changed, as did the classical music of the time. Italian composer Giacomo Puccini created some of the most popular operas of the early 1900s. In the late 20th and early 21st centuries people continued to perform and enjoy many of the old opera

masterpieces. Composers also created new operas.

► More to explore

Ballet • Classical Music • Mozart, Wolfgang Amadeus • Music • Theater

Opossum

Opossums are marsupials, or animals that carry their young in a pouch. They are sometimes called possums. Most opossums live in forests of Central and South America. The Virginia, or common, opossum is the only marsupial found in North America.

An opossum has a pointy snout, a pink nose, and beady black eyes. Some opossums are only about 6 inches (15 centimeters) long. Others are about the size of a house cat. A hairless tail makes up about half of the animal's length. Opossums have coarse fur that can be grayish white or nearly black.

Opossums often make their homes in hollow trees or under stumps and roots.



An opossum pretends to be dead to protect itself from predators.

They come out at night to eat whatever they can find, including insects, rodents, berries, rotting fruit, and even dog food.

A female opossum can give birth to as many as 25 babies. The babies spend four to five weeks in their mother's pouch. Then they spend eight or nine weeks clinging to the mother's back.

Opossums have a unique way of escaping enemies. Most predators like to eat live food and will lose interest in animals that are already dead. So an opossum sometimes pretends to be dead when an enemy is near. It freezes like a statue and then falls over. When the predator loses interest and leaves, the opossum gets up and walks away. This trick has become known as "playing possum."

► More to explore

Marsupial

Optics

Optics is the study of light. Optics describes how light is created and how it travels. An important part of optics is the study of what happens when light hits different surfaces. When light hits a surface, it may be reflected, refracted, or absorbed.

Reflection occurs when light hits a surface and bounces back. Reflected light makes images appear in mirrors and in other smooth, shiny surfaces.

Refraction happens when light changes direction, or bends, when it moves from one material to another. For example,



Refraction causes straws to appear bent at the surface of water.

light traveling through the air refracts when it hits water. This can make a straw in a glass of water look bent at the surface of the water.

Some surfaces neither reflect nor refract light. They absorb, or take in, light. This causes the surface to heat up. For example, a sidewalk heats up on a hot, sunny day because it is absorbing light.

Mirrors and lenses are important tools in optics because they reflect and refract light. Eyeglasses, magnifying glasses, telescopes, and binoculars all have lenses or mirrors. They change the way people see things by controlling how light enters the eye.

► More to explore

Lens • Light • Mirror

Orange

Oranges are citrus fruits with fragrant, leathery skin and juicy flesh. The most common types are the sweet (or com-



The leathery skin of navel oranges protects the juicy flesh inside.

mon) orange, the sour (or Seville) orange, and the mandarin orange. The sweet orange is the most widely grown citrus fruit in the world.

Orange trees originally grew in the tropical regions of southeastern Asia. Today people grow them in most warm areas of the world.

Most sweet orange trees are about 20 feet (6 meters) tall. They have glossy, green leaves and small white flowers.

The size, shape, and color of orange fruits vary somewhat depending on the type. The fruits are generally round and about 2 to 4 inches (5 to 10 centimeters) across. The peel is commonly orange or greenish yellow. It is dotted with oily glands that give the fruit a strong fragrance.

Oranges are rich in vitamin C. People peel and eat oranges raw. They also use them in sauces, marmalades, and other

foods. Orange juice is sold fresh or frozen. People use orange oil as a flavoring or as a fragrance.

► **More to explore**

Citrus Fruit • Fruit

Orangutan

The orangutan is the largest animal that spends most of its time in trees. It is a reddish ape related to gorillas, chimpanzees, and bonobos. All these animals are called great apes because of their large size and great intelligence. Orangutans and other great apes belong to the larger group of mammals called the primates. The primates also include other apes, monkeys, and humans.

Orangutans are the only great apes of Asia. They are found only in certain jungles on the islands of Borneo and Sumatra in Indonesia. In the past they also lived in mainland Southeast Asia.



A male orangutan looks down from the branches of a tree.

They are no longer as widespread because people have hunted them and destroyed their habitats. Orangutans are endangered, or at risk of dying out completely in the wild.

Orangutans have a short, thick body with shaggy red or orange hair. They have long, powerful arms and short legs. Adult male orangutans are about twice the size of the females. The adult males are almost 4.5 feet (1.4 meters) tall. They may weigh as much as 285 pounds (130 kilograms).

Orangutans eat a great variety of foods, including fruit, leaves, bark, and insects. Unlike almost all other apes and monkeys, adult orangutans tend to live alone. They use their hands and feet to

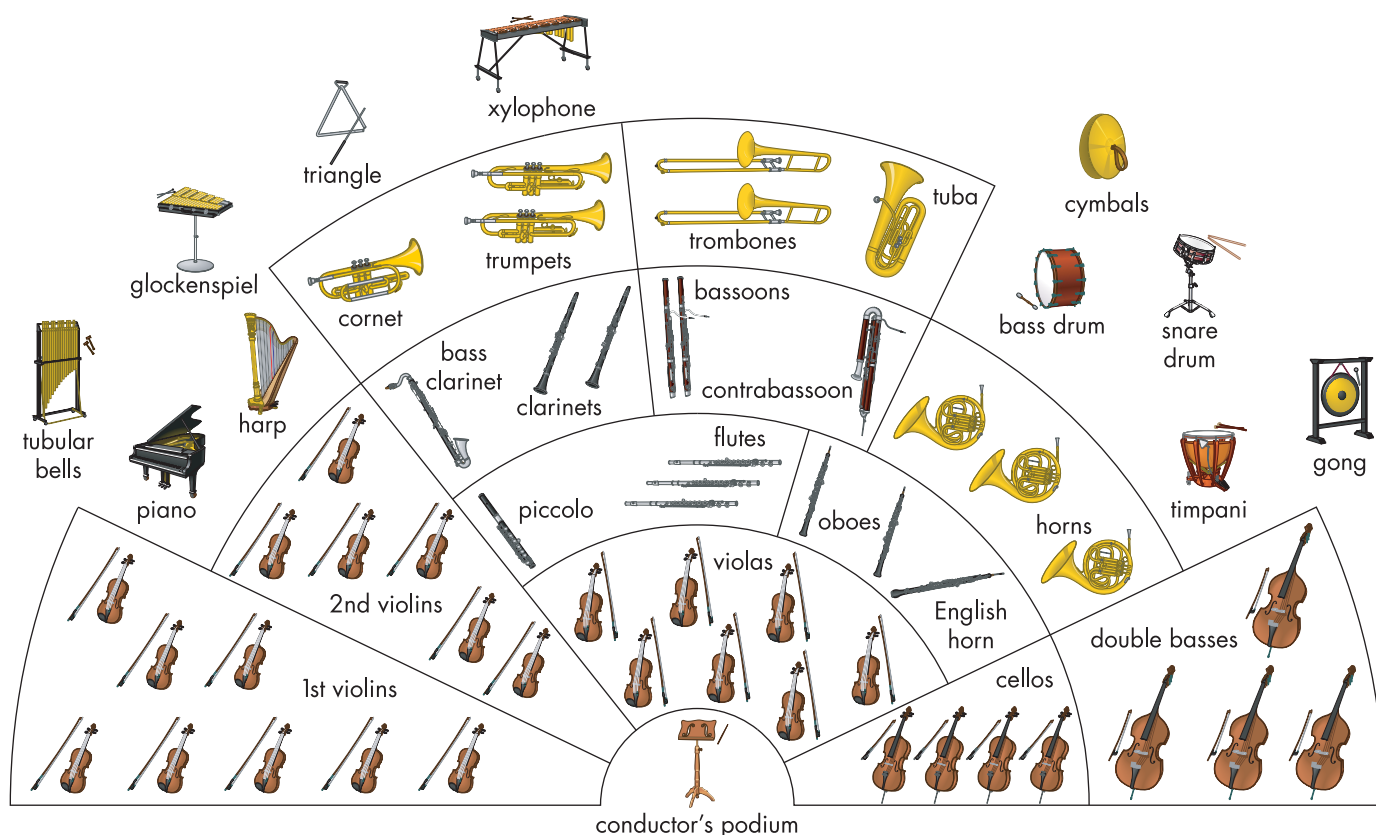
climb and walk along tree branches. The adult males sometimes have to walk on the ground to travel long distances. This is because smaller tree branches cannot support their weight.

► More to explore

Ape • Endangered Species • Primate

Orchestra

An orchestra is an assembly of musicians that performs musical works written for a group. In Western countries an orchestra usually includes stringed instruments, such as violins, cellos, and violas; woodwind instruments, such as flutes, oboes, and bassoons; brass instruments, such as trumpets, trombones, and tubas; and percussion instruments, such as



A chart shows where the players sit in a large modern orchestra: strings in front, woodwinds behind them, brass behind the woodwinds, and percussion in back.

drums, gongs, and the xylophone. But an orchestra can include whatever instruments are needed to perform a musical work.

In the early days of classical music different types of instruments were generally not played together. In about the 1600s European composers began experimenting with mixing the different sounds each type of instrument produces.

The modern orchestra developed in the 1700s in Germany, where the four basic instrument sections were established. Some individual instruments, such as the harpsichord and the lute, were phased out. Others, such as the clarinet and the piano, were sometimes added. Orchestras grew much larger during the 1800s, with some works calling for well over 100 musicians. In the early 1900s a smaller orchestra, called a chamber orchestra, was developed. A chamber orchestra has about two to eight members and usually focuses on stringed instruments and piano.

► More to explore

Classical Music • Musical Instrument

Orchid

Orchids are plants prized for their beautiful and unique flowers. Orchids make up one of the world's largest plant families, with between 15,000 and 35,000 species, or types. Many people grow orchids as a hobby.

Orchids grow in most parts of the world except for the areas near the North and

South poles. Most orchids prefer warm, tropical areas. Orchids can grow in soil, completely underground, or on other plants or rocks. The species that grow on other plants or rocks get moisture and nutrients from rainwater, rotting plant matter, or the air.

Orchid plants can measure from less than an inch (2.5 centimeters) to more than 15 feet (4.6 meters) tall. There can be a single flower or clusters. The flowers can be as small as 0.1 inch (2.5 millimeters) or as large as 15 inches (38 centimeters) across. They can be almost any color, and some have spots or streaks. Many orchids have a strong fragrance, or smell, but some have no fragrance at all.

The flavoring known as vanilla comes from the seedpods of some orchid plants. It is used in baked goods and beverages, and it is an ingredient in perfumes as well.

► More to explore

Flower • Plant



Moth orchids come from Indonesia and the Philippines.

Did You Know?

The violin player who sits in front is called the concertmaster. This person helps the conductor lead the orchestra.

Oregon



A hiker stops to enjoy Elowah Falls in Oregon's Mount Hood National Forest.

The state of Oregon is at the heart of the Pacific Northwest region of the United States. Oregon's countryside is filled with beautiful scenery. It has seaside beaches, mountain ranges, canyons, and waterfalls. Oregon is nicknamed the Beaver State. During the region's early history, the beaver's valuable fur was the area's most important trade good. Salem is the state capital.

Geography

Oregon is bordered by Washington to the north and the Pacific Ocean to the west. California and Nevada are to the south. Idaho is to the east. The Columbia River serves as most of Oregon's northern boundary. The Snake River marks part of the eastern boundary.

The Cascade Mountains are located in west-central Oregon. The mountains divide the state into two geographical

sections, west and east. To the west of the Cascades are rain forests, mountains, and lush valleys. Mount Hood is located in the Cascades. It is the state's highest peak at 11,239 feet (3,428 meters). East of the Cascades the land is drier. This section includes plateaus, deserts, and mountains. The Blue and Wallowa mountains are in the northeast.



People

The population of Oregon increased by more than one fifth between 1990 and 2000. This rate of growth was much higher than in most other states in the nation. Whites of European descent represent more than four fifths of the population. Hispanics are the largest minority group. They make up about 8 percent of the state's population.

Most of Oregon's people live west of the Cascade Mountains in the Willamette River valley. The state's three largest



cities—Portland, Eugene, and Salem—are located in this area.

Economy

Oregon's economy has traditionally been dependent on natural resources such as forest products. Harvesting trees for lumber and plywood remains an important industry. In the late 1900s, however, high-technology and service industries became increasingly important. The production of computer and electronic equipment became a major manufacturing industry. The state also produces clothing and other textiles. Tourism is an important service industry in Oregon. It provides jobs in hotels and restaurants.

Greenhouse and nursery plants, cattle, and milk and cheese are leading agricultural products. Oregon's fisheries catch seafood products such as salmon, tuna, and crab.

History

Many Native American tribes lived in the Oregon region before the arrival of white settlers. Among them were the Chinook, the Nez Percé, and the Klamath peoples.

In 1579 the English explorer Francis Drake claimed the region for his country. The land remained unexplored for two centuries, however. In 1792 Boston merchants made the first United States claim to the Pacific Northwest. The explorers Lewis and Clark reached the mouth of the Columbia River in 1805.



Portland is the largest city in the U.S. state of Oregon. It is located in the scenic northwestern corner of the state.

The first white settlers were fur trappers and traders who arrived in the early 1800s. In the mid-1800s, settlers from every state traveled to the area along the famous Oregon Trail. At the time both the United States and Great Britain claimed the land that is now Oregon and Washington. The two countries finally settled their boundary dispute in 1846, and the United States soon created the Oregon Territory. In 1853 Washington Territory separated from Oregon, and in 1859 Oregon became the 33rd state.

By the early 1880s railroad lines reached Oregon. The railroads linked Oregon with the rest of the United States. During the 1900s Oregon's cities grew rapidly. Many people were drawn by the environment to move there from other states. The state passed several laws in the late 1900s to protect the environment.

► More to explore

Lewis and Clark Expedition • Oregon Trail • Salem

Facts About OREGON

Flag



Population

(2000 census)
3,421,399—
rank, 28th state;
(2008 estimate)
3,790,060—
rank, 27th state

Capital

Salem

Area

98,381 sq mi
(254,805 sq
km)—rank, 9th
state

Statehood

February 14,
1859

Motto

She Flies with Her
Own Wings

State bird

Western
meadowlark



State flower

Oregon grape



Oregon Trail

In the middle years of the 1800s many thousands of U.S. pioneers traveled west on the Oregon Trail. The trail ran from Independence, Missouri, to what is now northern Oregon, near the Columbia River. It was about 2,000 miles (3,200 kilometers) long. The Oregon Trail was one of two main routes to the Far West. The other was the Santa Fe Trail, which led to New Mexico.

Unlike a modern highway, the Oregon Trail was not a single clear path. In places it was 10 miles (16 kilometers) wide. There were also many shortcuts and side paths. Some people who used the trail were bound for Utah or California, not Oregon.

Pioneers traveled the Oregon Trail in covered wagons pulled by horses, mules,

or oxen. The trip to Oregon took about four to six months. The pioneers brought some food with them and also hunted along the trail. They got water from rivers.

The Oregon Trail followed paths that had already been discovered. Between 1804 and 1806 the explorers Meriwether Lewis and William Clark traveled from Missouri to Oregon and back. Fur traders and missionaries later found other paths that became part of the trail. Wagon trains carrying hundreds of pioneers first used the trail in the early 1840s. In the 1860s railroads began replacing much of the travel by wagon train. However, people still used the trail until 1880.

► More to explore

Lewis and Clark Expedition • Pioneer Life • Santa Fe Trail



The Oregon Trail began in the U.S. state of Missouri and ended in what is now Oregon.

Organization of American States

Twenty-one countries in North America, Central America, and South America formed the Organization of American States (OAS) in 1948. The countries had several goals. One goal was to bring order and justice to all the member countries. Another goal was to protect the member countries. A third goal was to maintain each country's independence.

Today the OAS has 35 member countries. The countries work together in several different bodies, or groups. The General Assembly is the most important body of the OAS. It meets once a year to make decisions about the OAS's plans and actions. Each country has one vote in the General Assembly.

The OAS works to support democracy. Members promote democratic governments throughout the Western Hemisphere. For example, the OAS has watched over elections in member countries to make sure that they are fair.

The OAS also supports human rights. Many of its programs and services help people to be treated well.

In the early 21st century the OAS focused on fighting terrorism. It also encouraged trade among member countries.

► More to explore

Democracy • Human Rights • Trade

Organization of the Petroleum Exporting Countries

The members of the Organization of the Petroleum Exporting Countries (OPEC) are countries that produce more petroleum (oil) than they need. OPEC tells these countries how much oil to export, or ship to other countries. It also tells them how much money to charge for the oil. OPEC's head office is in Vienna, Austria.

Oil is used to make gasoline and other fuels. Many countries produce no oil. Others, including the United States, produce less oil than they use.

In 1960 the oil-rich countries of Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela created OPEC. They wanted to gain greater control over oil prices. Qatar,



A news conference gives OPEC representatives a chance to explain their actions.

Did You Know?

The OAS protects the rights of women and children. It also works to improve people's health and education.

Indonesia, Libya, the United Arab Emirates, Algeria, Nigeria, and Angola joined OPEC later.

OPEC's Growing Power

In 1973 the Arab members of OPEC became angry because the United States and some European countries were supporting Israel in the Arab-Israeli wars. As punishment, OPEC began raising the price of oil. For a time OPEC also stopped shipping oil to the United States.

As oil prices rose, OPEC countries became wealthy. The countries that depended on OPEC's oil had economic problems caused by the high prices. Gradually these countries looked for other sources of oil and for other forms of energy so they would not need to buy as much oil. As a result, OPEC's power was reduced. However, OPEC countries still controlled about two thirds of the world's oil supplies.

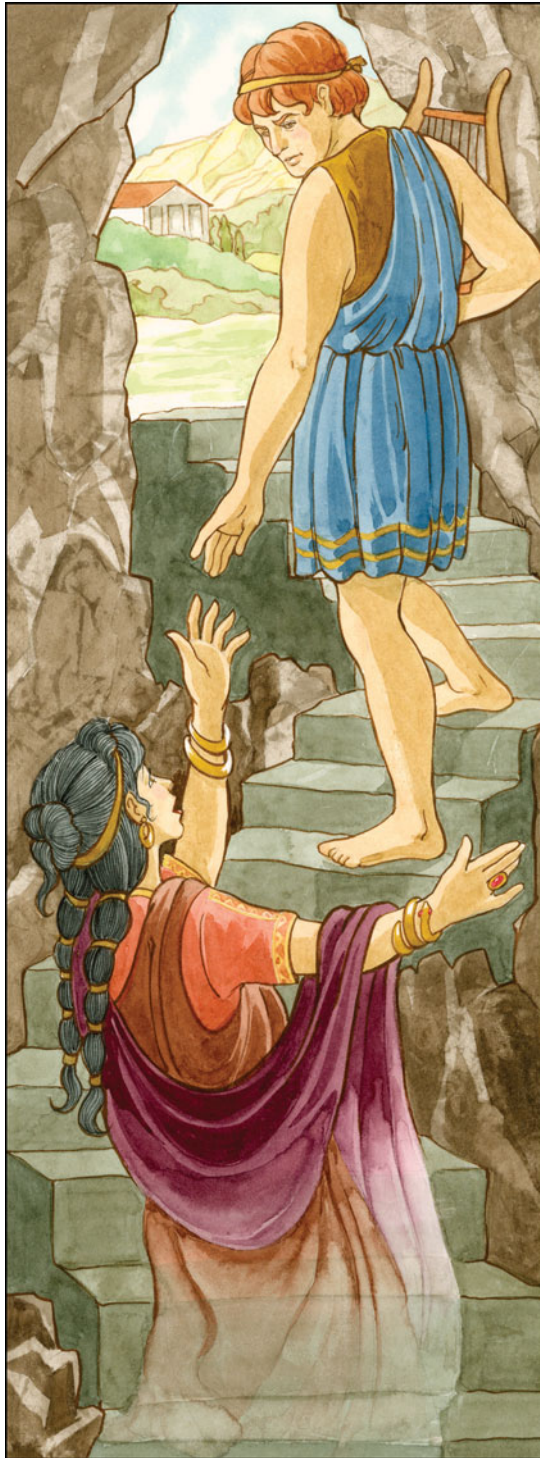
► More to explore

Arab-Israeli Wars • Petroleum

Orpheus and Eurydice

In ancient Greek and Roman mythology Orpheus was a hero and outstanding musician. Eurydice was his wife. Several books, movies, and musical pieces have been written about their tragic love story.

According to legend, Orpheus' mother was a Muse. The Muses were goddesses who inspired musicians and artists.



The story of Orpheus and Eurydice was a tragic love story. Orpheus failed to bring Eurydice back from the land of the dead.

Orpheus sang and played a stringed instrument called a lyre. No one could resist Orpheus' music. Even the animals and trees moved around him in dance.



Osceola

Osceola was born in Georgia in about 1804. His mother belonged to the Native American group called the Creek. His father may have been a white trader.

When Osceola was a boy, the U.S. government forced many Creek out of Alabama and Georgia. Osceola's family moved to northern Florida. They joined the Seminole.

Osceola first attracted attention by speaking out against the Treaty of Payne's Landing. This was an agreement that called for the Seminole to be moved to Indian Territory (now Oklahoma).

Osceola went to prison for fighting against the move. He was released after pretending to change his mind. He then organized a fighting force. The warriors killed the U.S. official who had jailed Osceola. They also killed the Seminole chief who had signed the treaty. These attacks sparked the Second Seminole War in 1835.

Osceola's warriors killed as many as 2,000 U.S. soldiers. Osceola himself was slightly wounded.

In 1837 Osceola agreed to meet with U.S. officials. They seized him during peace talks. The public was outraged. Osceola was put in a South Carolina prison. He died there on January 30, 1838. The Seminole continued fighting until 1842. Then most of them moved to Oklahoma.

► More to explore

Native Americans • Seminole

Osiris

► see Isis and Osiris.

Oslo



Population
(2008
estimate), city,
560,484; urban
area, 856,915

Oslo is the capital of Norway, a country in northern Europe. It is Norway's largest city and busiest seaport. Most of the country's major museums, theaters, and other cultural centers are in Oslo.

Most people in Oslo work for the government or businesses that provide services. Oslo is Norway's center of trade, banking, industry, and shipping. Ship-

building and engineering also are leading industries in the city. Many companies in Oslo are involved in high technology, communications, medicine, research, and energy.

People settled in the Oslo area in about 1000. King Harald III Sigurdsson of Norway founded a town there in about 1050. In 1624 a fire completely destroyed Oslo.

King Christian IV, who ruled Denmark and Norway, then built a new town across the river. The new town was named Christiania. It became the capital of Norway in 1814. During the 1800s Christiania grew rapidly and became Norway's largest city. In 1925 the city was renamed Oslo.

► More to explore

Norway

Ostrich

The ostrich is the largest living bird. Its scientific name is *Struthio camelus*.

Unlike most other birds, the ostrich cannot fly. But it can run very fast. An ostrich can run at a speed of 45 miles (72 kilometers) per hour.

In the wild ostriches are found in the countryside in parts of Africa. Some people also raise ostriches for the birds' meat, eggs, and hides.

Ostriches are tall birds. The males may reach a height of 8 feet (2.4 meters) or more. The females are somewhat smaller.



Male ostriches have black and white feathers.

Male ostriches are mostly black, with white feathers on the wings and tail. The females are mostly brown. An ostrich's head and neck are lightly covered with short feathers. The legs are strong and do not have any feathers. Each leg ends in two toes.

Ostriches use their short, wide bills to graze on grasses and other plants. They sometimes eat insects, too.

The eggs of ostriches are the largest eggs in the world. They average about 6 inches (15 centimeters) in length and 5 inches (13 centimeters) across.

► More to explore

Bird • Bird, Flightless

Oto

The Native Americans known as the Oto were once part of a Great Lakes

Did You Know?

Ostriches have big brown eyes with thick lashes.

people called the Winnebago. Long ago a large group of Winnebago broke away and moved west. There they split into three tribes called the Iowa, the Missouri, and the Oto. The Oto settled in what are now the states of Missouri, Iowa, Kansas, and Nebraska.

The Oto lived in houses that they made by covering a wood frame with mud. They grew crops such as corn, beans, squash, and melons. They hunted deer, raccoons, turkeys, and rabbits. They also hunted bison (buffalo) on the Great Plains.

The Oto rejoined the Missouri people in 1829. The U.S. government made the Oto and the Missouri give up most of their land. In the 1880s the government forced the tribes to move to a reservation in Indian Territory (now Oklahoma). There they became known as the Otoe-Missouria Tribe of Oklahoma. In the late 20th century there were about 1,500 Otoe-Missouria in the United States.

► More to explore

Native Americans • Winnebago

Ottawa



Population
(2006 census),
city, 812,129;
metropolitan
area,
1,130,761

Ottawa is the capital of Canada, a country in North America. The city lies

where the Gatineau, Ottawa, and Rideau rivers meet in the province of Ontario. Across the Ottawa River is the province of Quebec.

Many people in Ottawa work for the government. Many others work in health care, trade, education, or communications. Tourism is also one of the city's leading industries. Hundreds of companies in Ottawa design and make electronics, computers, software, and other high-technology products.

American Indians lived in the Ottawa area hundreds of years ago. In the 1600s French explorers and traders began traveling along the area's rivers. Great Britain took control of Canada in the late 1700s.

In 1826 a British engineer named John By began building the Rideau Canal in the area. The canal joined the Ottawa River and Lake Ontario. Many builders came to work on the canal. A settlement called Bytown soon grew near the building site. In 1855 Bytown was renamed Ottawa, after the Ottawa Indians. The British queen Victoria named Ottawa the capital of Canada in 1857.

► More to explore

Canada • Ontario

Otter

Otters are mammals that live in and around water. Unlike most other animals, otters are playful even as adults. They like to slide down riverbanks and in snow. Otters are found throughout

Did You Know?

Ottawa is one of the largest French-speaking cities in Canada. Over half of the residents speak the language.



There are 13 species, or types, of otter. They all have long, flat tails that make it easier to swim.

Africa, North and South America, Europe, and Asia. They belong to the weasel family.

Most species, or kinds, of otter live near rivers. Some live near lakes or streams. The sea otter lives in the ocean. Otters are great swimmers and divers. They eat fish, shellfish, and other water animals.

Otters have a slender body, a long neck, and short legs. They are typically 3 to 5 feet (1 to 1.5 meters) long and weigh between 6.5 and 60 pounds (3 and 27 kilograms). The sea otter is the heaviest. It weighs almost 90 pounds (41 kilograms). Webbed feet and a long, flattened tail help otters swim. Thick fur keeps them warm in cold water. The fur is usually brown, sometimes with white markings. Female otters have one to five young at a time.

Some otter species are endangered, or in danger of dying out. Pollution has dam-

aged land where otters once lived. Also, people hunt otters for their fur.

► More to explore

Endangered Species • Mammal

Ottoman Empire

The Ottoman Empire began in what is now Turkey in about 1300. Eventually, it grew to cover much of the Middle East, southeastern Europe, and North Africa. During the 1400s and 1500s the Ottoman Empire was one of the world's great powers. In the 1900s the remains of the empire became the Republic of Turkey.

Growth of the Empire

The empire was named after its founder, Osman I. Osman was born in 1258 in Anatolia, or Asia Minor (modern Turkey). His people were the Turks, who were Muslims (followers of Islam). Osman led the Turks against the Byzantines, who were Christians. He and the leaders who followed him took over many Byzantine territories.

In 1453 the Ottomans captured Constantinople, the capital of the Byzantine Empire. They renamed the city Istanbul and made it their own capital.

In 1517 the Ottomans took control of Mecca and Medina, the holiest cities of Islam. After that, the Ottoman ruler, or sultan, was seen as the leader of Islam. Süleyman I, the sultan from 1520 to 1566, expanded the empire further. During his reign, the Ottoman Empire stretched from Hungary to the Persian



The Ottoman Empire once controlled lands in Europe, Africa, and Asia.

Gulf. Its lands also included Egypt and the coast of North Africa.

End of the Empire

The Ottoman Empire began to lose power in the late 1500s. Economic problems led to unrest among people ruled by the empire. In 1683 the Ottomans failed in an attempt to capture the city of Vienna in Austria. This battle led to a century of wars with European leaders. The Ottomans lost a great deal of territory as a result.

In World War I (1914–18) the empire fought with Germany on the losing side. This defeat caused the empire to fall apart completely. In 1923 a group of young Turks formed the new country of Turkey.

► More to explore

Islam • Istanbul • Turkey

Ouagadougou



Population
(2006 census)
1,181,702

Ouagadougou is the capital of Burkina Faso, a country in western Africa. It is the largest city in Burkina Faso.

Many people in Ouagadougou work for the government. Many other people work in service industries such as health care and banking.

Ouagadougou was founded in the 1000s or 1100s. It became the capital of a kingdom of the Mossi people in the

1400s. The Mossi are the largest group of people in Burkina Faso today. The leader of the Mossi people still lives in Ouagadougou.

In 1919 France made the area into a colony called Upper Volta. In 1960 Upper Volta became an independent country with Ouagadougou as its capital. The country was renamed Burkina Faso in 1984.

► More to explore

Burkina Faso

Oviraptor

When scientists discovered *Oviraptor* it appeared to be lying on top of the eggs of another dinosaur. They named the dinosaur *Oviraptor*, which means “egg thief.”

When and Where *Oviraptor* Lived

Oviraptor lived 99 to 65 million years ago. Remains of *Oviraptor* have been

found mainly in Asia, but some also have been found in North America.

Physical Features

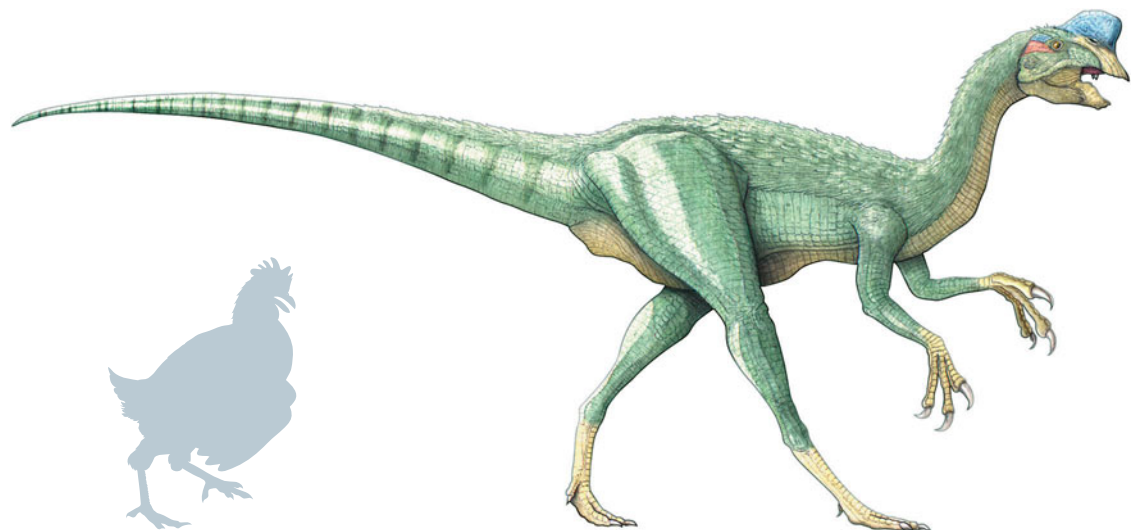
Oviraptor grew to a length of about 6 feet (1.8 meters) and stood about 3 feet (0.9 meter) tall. It weighed about 70 pounds (32 kilograms). The dinosaur had a razor-sharp beak instead of teeth. Its head was short and deep and looked like the head of a parrot. It stood and walked on its two slender back legs. Its front legs were shorter than the back legs. *Oviraptor* had a long tail, which may have helped it to balance.

Behavior

Scientists found the first *Oviraptor* skeleton in the nest of what they believed was a horned dinosaur. They assumed that it fed on eggs stolen from the nest. Later discoveries made scientists believe that *Oviraptor* was trying to hatch its own eggs.

► More to explore

Dinosaur



Oviraptor was much larger than a modern chicken.

Owens, Jesse



Jesse Owens runs in the 1936 Olympic Games.

African American track-and-field athlete Jesse Owens won four gold medals at the 1936 Olympic Games. His achievements were important for himself and for many other people at the time. The Games were held in Berlin, Germany. Nazi leader Adolf Hitler was in power there. The Nazis believed white athletes were best. But Owens proved that they were wrong.

James Cleveland Owens was born in Oakville, Alabama, on September 12, 1913. His family later moved to Cleveland, Ohio, in search of better opportunities. In school James, or J.C., became known as Jesse.

Jesse became a track star at a young age. In 1928 he set track records in the high jump and the running broad jump (long jump). In 1933, while he was in high

school, he broke three other records. He then went to Ohio State University.

In the Olympics Owens won gold medals for the running broad jump, the 100- and 200-meter races, and the 4 × 100-meter team relay. He also set new Olympic and world records.

Owens graduated from college in 1937 and worked for the Illinois Athletic Commission. He later got involved in guidance activities for young boys. He also made goodwill visits to countries in Asia for the U.S. government. Owens died from cancer in Phoenix, Arizona, on March 31, 1980.

► More to explore

African Americans • Olympic Games

Owl

Owls are birds of prey, meaning that they hunt and eat animals. Unlike most other birds of prey, owls are nocturnal, or active



Like all owls, the common barn owl has large eyes, a hooked beak, and sharp claws.

at night. Common types of owl include barn owls and the short-eared owl.

Owls live around the world in almost every kind of habitat. Their length varies from about 5 to 28 inches (13 to 71 centimeters). Most owls have brown, gray, or white feathers with streaks or spots.

All owls look about the same. Each owl has a large head, a flat face, a hooked beak, and large eyes. It also has a short tail, long wings, and sharp claws. Owls have excellent eyesight and hearing. An owl cannot move its eyes much. But it can turn its head far around to look directly backward.

Most owls eat small animals such as mice, voles, and rabbits. Some owls eat insects, birds, or other animals.

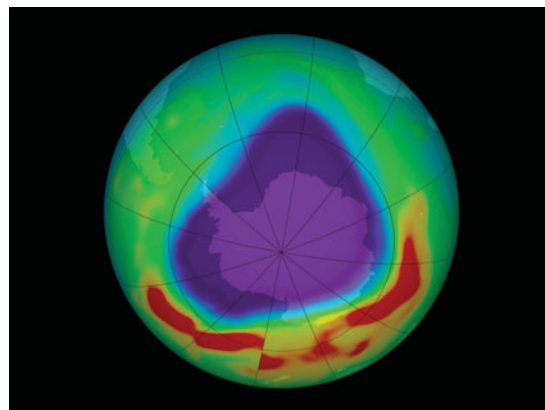
Owls make a variety of sounds. An owl may snap its bill, clap its wings in flight, or sing. Its song may be anything from deep hoots to chirps or whistles.

► More to explore

Bird • Bird of Prey

Did You Know?

Most owls swallow their prey whole. They later spit up the bones, fur, and feathers that they cannot digest.



Images from satellites high above Earth show the hole in the ozone layer over Antarctica.

differs from common oxygen in its chemical makeup. Each molecule of common oxygen has two atoms. Each ozone molecule has three atoms.

Ozone is a natural part of Earth's upper atmosphere. This part of the atmosphere, about 15 miles (24 kilometers) above the surface, is called the ozone layer. It protects people by absorbing harmful rays from the sun. If they reach Earth, these rays can cause skin cancer, eye diseases, and other health problems. Some chemicals used in industry can destroy this protective ozone. Scientists have found a "hole" in the ozone layer over Antarctica.

Though ozone is helpful high above Earth, it is a form of air pollution near Earth's surface. Even very small amounts can irritate people's eyes and cause coughing. Automobile exhaust combined with sunlight can increase the amount of ozone in the air.

► More to explore

Atmosphere • Molecule • Pollution

Oyster

► see Bivalve.

Ozone

Ozone is a pale blue gas. It is a form of oxygen. The common form of oxygen is a gas that all animals need to breathe. But ozone is poisonous and explosive. It

Britannica Student Encyclopedia

N-O



A collage of various subjects including a snake, a satellite, a globe, a knight, a bee, a flower, a lemur, and a large red letter P.

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P

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Baseball great Satchel Paige entered the major leagues in 1948, when he was about 42 years old.

(See Paige, Satchel.)

The Russian tsar Peter the Great disguised himself and worked in shipyards in England and the Netherlands. He did this to learn about the West.

(See Peter the Great.)

Philosophy means “love of wisdom” in Greek.

(See Philosophy.)

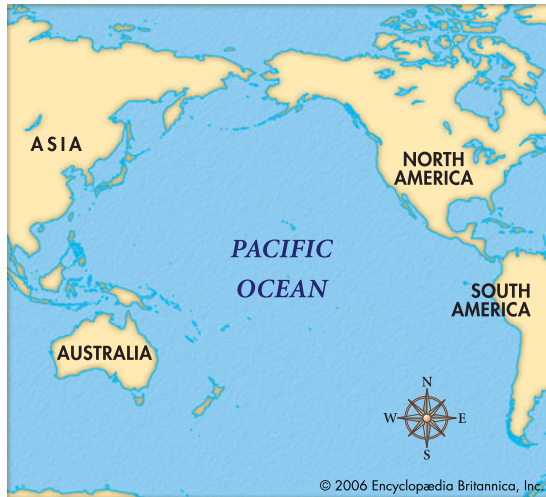
The Spanish artist Pablo Picasso created many famous paintings, including a masterpiece called *Guernica*.

(See Picasso, Pablo.)

Bees and other animals carry pollen, the substance that causes plants to form seeds, from flower to flower.

(See Pollen.)

Pacific Ocean



The Pacific is the largest of Earth's oceans. It covers more of Earth's surface than all the dry land put together. The explorer Ferdinand Magellan named the ocean *El Mar pacífico*, which means "the peaceful sea."

Physical Features

The Pacific Ocean extends to North America and South America to the east. Asia and Australia lie to the west. From north to south, the Pacific extends from the Arctic Ocean to the broad coast of



Many islands in the Pacific Ocean were formed from the stony skeletons of countless coral animals.

Antarctica. It covers about 63,800,000 square miles (165,250,000 square kilometers) in area.

The deepest point in the Pacific—or anywhere on Earth—is the Mariana Trench, near the Mariana Islands. At 36,201 feet (11,034 meters), it is much deeper than Earth's highest mountain, Mount Everest, is high.

Under most of the Pacific Ocean lies the enormous Pacific Plate. A plate is a rigid section of Earth's crust that moves slowly in relation to other plates. Several of these other plates surround the Pacific Plate. Many volcanoes and earthquakes occur where these plates meet. The chain of volcanoes around the edges of the Pacific is called the ring of fire.

Many large islands lie in the western Pacific. These include the island groups of Japan, the Philippines, Indonesia, and New Zealand. Smaller islands are scattered over a large area of the central and western Pacific, called Oceania. Volcanoes formed some of these islands, like Hawaii. Other islands are made of coral.

Currents and Climate

Winds drive the water near the ocean's surface into patterns called currents. In the North Pacific, the main current moves in a clockwise direction. The main current in the South Pacific runs counterclockwise. This means that in the extreme north and south, most winds and currents run eastward, while near the equator they run westward. Ocean winds and currents affect climate on land. For example, the Kuroshio, or

Japan Current, carries warm weather north to Japan and then east to the Pacific coast of Alaska and Canada.

Heat and water vapor (gas) sometimes combine to create large, circular storms with destructive winds and drenching rainfall. This type of storm is known as a typhoon. Typhoons are similar to hurricanes, which form in the Atlantic Ocean. Typhoons are most common in warm areas of the western Pacific.

Economy



Container ships carry goods across the Pacific Ocean between Asia and North American ports, such as Seattle, Washington.

The Pacific Ocean has abundant mineral resources. People take salt, bromine, and magnesium from the water. They take sand, gravel, and phosphate rock from the seabed. The ocean also has a rich variety of fish and other marine life. In addition, many ships on the Pacific carry goods between countries.

Exploration

People from Southeast Asia settled the islands of the Pacific over a long period starting about 3,000 to 4,000 years ago. The first known Europeans to see the Pacific Ocean were Spanish explorers led by Vasco Núñez de Balboa. Balboa saw the ocean from what is now Panama in 1513. The navigator Ferdinand Magellan entered the Pacific Ocean from the south in 1520. Dutch, French, and British explorers followed the Spanish. Captain James Cook of Great Britain explored the islands of the South Pacific in the 1700s. After he died in 1779, there were few islands that remained to be discovered by the outside world.

Environmental Issues

People have polluted some parts of the Pacific, especially near the shores of big cities and ports. Large amounts of factory waste, sewage, fertilizers, and pesticides have found their way into the ocean. Oil spills from ships have caused major problems in coastal areas. In addition, overfishing in the Pacific has greatly reduced the numbers of some types of fish and other sea animals.

► More to explore

Magellan, Ferdinand • Ocean • Oceania
• Ring of Fire

Paige, Satchel

Satchel Paige was an outstanding U.S. baseball player. He was a pitcher known for the speed and control of his fastball.

Did You Know?

A Pacific Ocean current called El Niño can cause storms in California, droughts in Australia, and other unusual weather.



Satchel Paige

Leroy Robert Paige was born in Mobile, Alabama, probably on July 7, 1906. As a child he earned money by carrying satchels, or bags, for people at the railroad station. This might be how he got the nickname Satchel. Paige became a good pitcher of fastballs while he was in school.

Paige spent most of his professional baseball career in the Negro leagues. He and other African Americans could not play in the major leagues at the time. Paige entered the Negro leagues in 1926. He played for a number of teams, including the Birmingham Black Barons, the Pittsburgh Crawfords, and the Kansas City Monarchs.

Paige was finally allowed into the major leagues in 1948. At about 42 years old, he was the oldest rookie ever in the major leagues. Paige helped the Cleveland Indians win the World Series that year. Paige later pitched for the Saint Louis Browns.

Paige retired after the 1953 season. He had played for almost 30 years. He might have won as many as 2,000 games. Paige was elected to the Baseball Hall of Fame in 1971. He died on June 8, 1982.

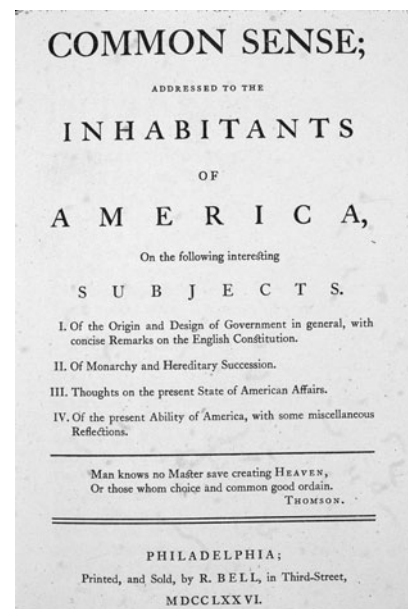
► More to explore

Baseball

Paine, Thomas

Thomas Paine was an important writer and thinker during the American Revolution. His powerful words moved many American colonists to join the fight against British rule.

Paine was born in Thetford, England, on January 29, 1737. At age 13 he left school to work for his father. As he grew up Paine moved from job to job.



Common Sense by Thomas Paine used plain language to convince American colonists to demand independence from Great Britain.

Paine never did well in England. When he was in his 30s he met Benjamin Franklin in London. Franklin encouraged Paine to move to America.

In 1774 Paine moved to the American colonies. With Franklin's help Paine began publishing his opinions in articles and pamphlets.

One of Paine's most famous pamphlets was *Common Sense*, published in 1776. *Common Sense* urged the colonies to declare independence from Great Britain. Paine's simple but strong message moved many people to action.

After the American Revolution Paine wrote against the rich. He recommended ways to help the poor. He refused to take money for his writing and fell into poverty.

In his later years Paine wrote against organized religion. This angered people in Britain and the United States. He became an outcast and suffered poor health. Paine died on June 8, 1809, in New York City.

► More to explore

American Revolution • Franklin, Benjamin

Painting

The art of creating pictures using colors, tones, shapes, lines, and textures is called painting. Museums and galleries show the paintings of professional artists. But painting is also a popular form of entertainment and creative expression.



A young painter uses paint, a brush, and her imagination to fill up a blank sheet.

People of all ages create pictures using a variety of materials. Experienced painters usually use a brush to apply oil paints or acrylic paints to a canvas cloth surface. Young painters usually use watercolors on sheets of paper. Very young children may use finger paints to create paintings.

Subjects

Painters can use their art to express devotion to a religion, to tell a story, to express feelings and ideas, or simply to present a pleasing image. Religious paintings often portray a god or a scene from a sacred text. Other common subjects have been famous legends and events in history, as well as scenes from daily life. Artists also paint portraits, or pictures of people. Sometimes artists make portraits of themselves, which are called self-portraits. All of these types of paintings portray the human figure in some way.

Some kinds of painting do not focus on people. In landscape painting the focus is on scenes from nature. Artists also paint motionless objects such as fruits

and vegetables. These works are called still-life paintings. Some artists communicate their ideas through images that do not represent any specific object. These works are called abstract paintings.

Elements of Design

The design of a painting is the arrangement of its lines, shapes, colors, tones, and textures into a pattern. The combination of colors and shapes can communicate a particular mood or produce a sensation of space, volume, movement, and light. Paintings are two-dimensional because they are created on a flat surface that has length and width but not depth. Some paintings look flat. Others, though, can look three-dimensional because of the way the painter uses lines, shading, and geometric shapes.

History

Humans have been making paintings for thousands of years. Paintings dating back 15,000 years have been found on the walls of caves in France and Spain. Cave paintings generally show animals that early humans hunted. Samples of



About 14,000 years ago prehistoric artists filled the ceiling of a cave in Spain with images of bison.



A small painting of chess players decorates a manuscript that was created in Persia (now Iran) in about 1560.

painted pottery from at least 5,000 years ago have been found in China and Iran. The ancient Egyptians decorated their tombs and temples with elaborate paintings. People in ancient Greece painted decorative objects such as vases in addition to the walls of temples.

Middle Ages

In many places, including ancient Egypt, Greece, Rome, and China, artists created miniature (very small) paintings to illustrate written texts. These texts are known as illuminated manuscripts. Miniature painting was long an important art form in India and parts of the Middle East. In Europe many illustrated handwritten Bibles and other special books were made during the Middle Ages (AD 500 to 1500).

Artists in eastern Europe also started painting religious pictures on wooden



Chinese painters have often used ink instead of paint.

panels. Toward the end of the Middle Ages European painters began creating easel paintings, or smaller works created on a portable frame called an easel. Easel paintings can be moved and hung on walls.

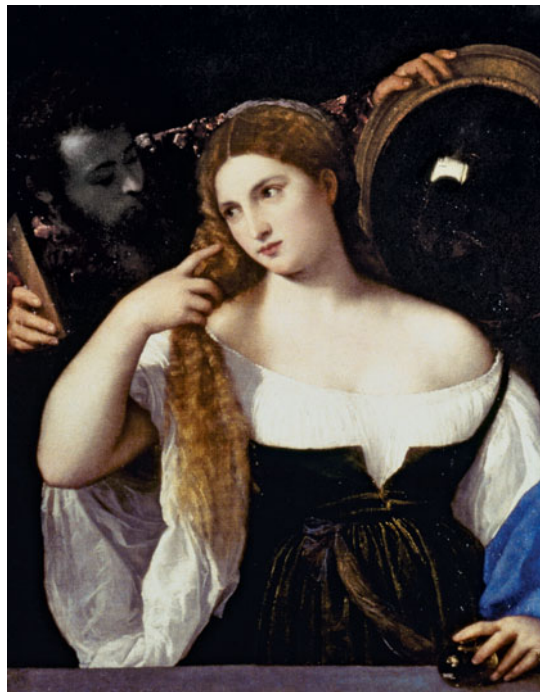
Meanwhile the Chinese and Japanese began a long tradition of creating water-color and ink paintings on long scrolls of paper or silk. Many of the Chinese scrolls were landscapes, while the Japanese scrolls often told a story by mixing text with pictures.

Renaissance

Great developments in European art occurred during a period called the Renaissance (mid-1300s to 1500s). Renaissance artists began to paint more realistic pictures than those of the Middle Ages. To do this, they carefully

observed the world around them. They also developed many painting techniques to create the illusion of a three-dimensional world on a flat painting.

In Florence and Rome (now in Italy) artists such as Raphael, Leonardo da Vinci, and Michelangelo introduced bold ideas. Leonardo in particular experimented with ways to create more natural shades of color and light. Later the Italian painters Titian, Tintoretto, and Paolo Veronese made Venice a major center of art. The Italian Renaissance influenced many artists in other parts of Europe, including Albrecht Dürer in Germany, Pieter Brueghel in what is now Belgium, and El Greco, who created his great works in Spain.



In the 1500s the Italian Renaissance artist Titian painted a portrait of a young woman arranging her hair.

Did You Know?

The color in paint comes from substances called pigments. Pigments are ground into a powder and mixed with oils or other substances.

Baroque, Rococo, and Neoclassicism

In the 1600s a style of art known as baroque became popular in Europe. Baroque paintings use rich colors and dramatic effects of light and shade to express strong emotions. The best-known baroque painters were the Italian artist Caravaggio and the Flemish artist Peter Paul Rubens. Other great painters of the 1600s were the Spanish artist Diego Velázquez and the Dutch artists Rembrandt and Jan Vermeer.

In the 1700s French painters such as Jean-Antoine Watteau created a style known as rococo. Their paintings featured soft landscapes and decorative scenes of elegantly dressed people. Reacting against the rococo style, artists such as Jacques-Louis David created a style called neoclassicism (meaning “new classicism”) in the late 1700s. They painted scenes from the classical world (ancient Greece and Rome) with clean lines and no extra details.

Romanticism and Realism

Some artists of the 1800s wanted to express their imagination and emotions in very personal paintings. They were part of a movement called romanticism. Many of these painters also had a strong appreciation for nature. For example, the English painters John Constable and J.M.W. Turner used light and color with great freedom in their landscapes.

Other artists of the 1800s painted in a style called realism. Instead of focusing on historical themes or grand ideas, they were interested in realistically showing

everyday life and its problems. For example, the French realist painter Gustave Courbet believed that paintings should inspire social change.

Impressionism and Beyond

In the late 1800s a group of French artists tried to capture the fleeting effects of light on colors in nature. Some tried to reproduce the effect of reflected light by putting thick touches of bright, contrasting color side by side. This style of painting came to be known as impressionism. Some of the greatest impressionists were Édouard Manet, Pierre-Auguste Renoir, Camille Pissarro, Claude Monet, and Edgar Degas.

Artists known as postimpressionists carried the movement further, with their own approaches to colors, shapes, and subject matter. Georges Seurat of France developed a style in which he painted entirely by using dots of color. This style was called pointillism. The Dutch artist



The French impressionist artist Camille Pissarro tried to show how sunlight falls on objects in an orchard.

Vincent van Gogh expressed powerful emotions by using rich colors and strong brushstrokes. A French painter, Paul Gauguin, used startling color to capture nontraditional scenes, especially of the South Pacific island of Tahiti.

Modern Painting

The impressionists and postimpressionists paved the way for modern forms of painting. Many modern painters have created abstract art, which does not represent anything from the outside world. Instead of showing recognizable people, places, or objects, these paintings focus on shapes, lines, colors, and textures. The Russian-born artist Wassily Kandinsky created some of the first abstract paintings in the early 1900s.

Pablo Picasso, a major painter of the 1900s, helped create a partly abstract style of painting called cubism. In cubism forms were broken apart into simple, flat shapes. Often more than one side of a person or object was shown at the same time. For example, the side of a person's nose might show, along with the front of both eyes.

In the 1920s artists such as Salvador Dalí and Joan Miró of Spain combined images from fantasy and reality in a style called surrealism. Surrealist painters sometimes showed ordinary objects in unexpected settings—for instance, a train emerging above a fireplace.

Several important painters of the time had highly individual styles. The French artist Henri Matisse experimented with bold color and repeated patterns. The



In the 20th century Mexican artist José Clemente Orozco made colorful paintings on Mexican subjects.

Russian-born French artist Marc Chagall filled his paintings with dreamlike images in rich colors.

In the United States there had been a strong tradition of realism. Some U.S. painters of the 1900s, including Edward Hopper, Grant Wood, and Andrew Wyeth, continued in that tradition. Others, such as Georgia O'Keeffe, were influenced by newer styles. O'Keeffe is known for her partially abstract paintings of animal bones, flowers, and rocks.

In the 1940s several artists in New York City created a style of painting called abstract expressionism. Painters such as Jackson Pollock, Willem de Kooning, and Mark Rothko used new techniques to create abstract pictures that expressed their feelings or free creativity. For instance, Pollock would lay a large canvas on the floor and drip and spill paint onto it.



Two people view an abstract painting by the 20th-century Spanish artist Joan Miró.

In the 1950s a movement known as pop art began. Artists such as Roy Lichtenstein and Andy Warhol used objects from popular (or pop) culture such as soup cans, street signs, advertisements, and comic strips in their work.

Artists continued to explore new ways of painting into the 21st century. They experimented with new materials and sometimes caused controversy by portraying religious and historical subjects in startling ways.

► More to explore

Color • Greco, El • Leonardo da Vinci • Michelangelo • Museum • Picasso, Pablo • Rembrandt • Van Gogh, Vincent • Warhol, Andy

Paiute

The Paiute are Native Americans of the western United States. The tribe is divided into two groups, the Southern Paiute and the Northern Paiute. The Southern Paiute traditionally lived in what are now Utah, Arizona, Nevada, and California. The Northern Paiute

lived in what are now Oregon, Idaho, Nevada, and California.

Most of the Paiute traditionally got their food by hunting, fishing, and gathering wild plants. They moved as the seasons changed. They stopped in places where food and water were available. While on the move the Paiute lived in wickiups. Wickiups were simple huts covered with brush.

White traders arrived on Paiute lands in the early 1800s. They offered the Paiute guns and other goods in exchange for furs. In the 1830s and 1840s many settlers traveled through Paiute territory on the way to California and Oregon. Late in the 1800s the U.S. government forced the Paiute to give up their land and move to reservations.

At the end of the 20th century there were about 10,000 Paiute. They lived mostly on or near reservation lands in Arizona, California, Nevada, Oregon, and Utah.

► More to explore

Native Americans



A photograph from the early 1900s shows a Paiute woman making a basket.

Pakistan

Pakistan is a Muslim country in southern Asia. It shares its early history with its neighbor India. Pakistan separated from India in 1947. Pakistan's capital is Islamabad.

Geography

Pakistan shares borders with Iran, Afghanistan, China, and India. The Arabian Sea, a part of the Indian Ocean, lies to the south. The region called Kashmir is to the northeast. Pakistan and India have long fought for control of Kashmir.

In northern Pakistan the Himalayas and the Karakoram Range include some of the highest mountains in the world. Among them is K2, the world's second tallest peak at 28,251 feet (8,611 meters). (Only Mount Everest is taller.) Western Pakistan is a very dry region of deserts, salt lakes, and a narrow plain along the coast. The Indus River flows through fertile plains in the east.

Pakistan has hot summers and cool or cold winters. It is generally very dry. Winds called monsoons bring some rain in the summer.

Plants and Animals

Some forests grow on Pakistan's mountain slopes. Grasses, dry bushes, and small trees grow in the rest of the country.

Brown bears, black Himalayan bears, wild sheep, and rare snow leopards live

in the northern mountains. The area near the mouth of the Indus River has crocodiles, pythons, and wild boars. Jackals, foxes, wildcats, and many rodents and reptiles live throughout the country.

People

The people of Pakistan are a mixture of different groups that have come to the region over thousands of years. The five major groups are the Punjabis, the Pashtuns, the Sindhis, the Balochis, and the *muhajirs*. Punjabis make up about half of the population. Their language, called Punjabi, is the most commonly spoken one.

Almost everyone in Pakistan practices Islam. When Pakistan separated from the Hindu state of India, millions of Muslims left India to settle in Pakistan. Those people and their descendants are the *muhajirs*. They speak Urdu. Urdu is





A Pakistani girl works in a cotton field.

also the language of government and education.

The majority of the people live in rural areas, but the cities have grown rapidly. Most people live in the east.

Economy

Many Pakistanis work in services, including transportation, communications, and government work. Many others work in agriculture. The main crops are wheat, rice, sugarcane, and cotton. Farmers also raise goats, sheep, cattle, and water buffalo.

Agriculture provides raw materials for some of Pakistan's most important industries. Pakistan sells cotton cloth and clothing to other countries. Workers make carpets out of wool and leather goods from hides and skins. Other industries in Pakistan make fertilizers, processed foods, and cement. The

country also mines some coal, oil, and natural gas.

History

Pakistan shares much of its early history with India. More than 4,000 years ago people in what is now Pakistan built great cities in the valley of the Indus River. The Indus Valley civilization lasted until 1700 BC. Greeks, Turks, and other peoples later invaded the region.

The Mughal Empire took power in the early AD 1500s. The Mughal rulers practiced Islam. Some of the finest mosques (Muslim houses of worship), shrines, tombs, and gardens in Pakistan were created under the Mughal Empire.

In the 1850s the government of Great Britain took over India. The Pakistan region was a part of British India until the mid-1900s.

Separation from India

In 1947 Britain divided British India into two new countries: Pakistan and India. The parts of British India that



Ancient tombs stand in ruins in southeastern Pakistan.

Facts About PAKISTAN



Population
(2008 estimate)
161,910,000

Area
307,374 sq mi
(796,096 sq km)

Capital
Islamabad

Form of government
Military-backed constitutional regime

Major cities
Karachi, Lahore, Faisalabad, Rawalpindi, Multan



TIMELINE

The Indus Valley civilization develops.

about 2500 BC

The British government takes over India.

1858

The Muslim Mughal Empire begins.

1526

Pakistan fights India over the territory of Kashmir.

1965

Pakistan gains independence.

1947

General Pervez Musharraf takes power in Pakistan.

1999

East Pakistan wins independence as Bangladesh.

1972

had more Muslims became Pakistan. The parts with more Hindus became India. Pakistan included two regions, West and East Pakistan. They were separated by more than 1,000 miles (1,600 kilometers) of Indian territory.

After the British left, many Muslims left India for Pakistan, and many Hindus left Pakistan for India. Many Muslims and Hindus killed each other during this period.

War

Both Pakistan and India wanted the region called Kashmir. The conflict over Kashmir led to war between the countries in 1965. Pakistan and India agreed to end the war later that year, but they continued to battle over the territory from time to time.

Meanwhile, the people of East Pakistan demanded independence from West Pakistan. A civil war between the two

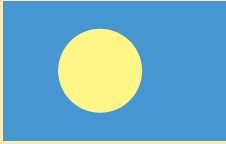
Pakistans began in 1971. With the help of the Indian army, East Pakistan became the independent country of Bangladesh in 1972. Pakistan's territory now included only West Pakistan.

Recent Times

The government of Pakistan changed often after independence. The military seized control of the country several times. In 1999 an army general named Pervez Musharraf took power. In 2001 Musharraf supported the United States in its war on terrorists in nearby Afghanistan. Many Pakistanis protested Musharraf's decision to help the United States. Musharraf also faced terrorist attacks within Pakistan. In 2008 he was forced to give up control of the country. A new president was elected in September of that year.

► More to explore

Bangladesh • India • Indus Valley Civilization • Islam • Islamabad • Mughal Empire



Palau

The Republic of Palau is a chain of small islands in the western Pacific Ocean. After gaining independence in 1994, Palau established a temporary capital on Koror Island. In 2006 Palau established a new capital at Melekeok on Babelthup Island.

Geography

Palau is part of the island group known as Micronesia, which is in the Pacific region called Oceania. Palau includes about 340 small islands. Babelthup is the largest island. Koror Island is much smaller, but most of the country's people live there. Raised ridges of coral called coral reefs surround the islands. Palau has a hot climate with heavy rain.

Plants and Animals

Grasslands and rain forests cover Babelthup Island. Coconut palm trees grow throughout Palau. More than 350 kinds of coral and 1,400 types of fish live in Palau's waters. The islands' colorful birds include Palau doves and Palau fantails.



Palau is made up of more than 300 small islands.

People

Most of the islanders are Palauans. Filipinos and other Asians form the next largest group. Palauan and English are the main languages. Christianity is the main religion.

Economy

Tourism and fishing are important parts of Palau's economy. Many people work for the government. Others make clothing or crafts. Small farms produce root vegetables and eggs.

History

Palau's first settlers came from Indonesia, the Philippines, New Guinea, and other Pacific islands more than 2,000 years ago. Spanish explorers arrived in 1543. In 1899 Spain sold the islands to Germany. Japan seized Palau at the start of World War I (1914–18).

The United States took Palau from Japan during World War II (1939–45). Palau became an independent country in 1994.

► **More to explore**
Oceania

Facts About PALAU



Population
(2008 estimate)
20,300

Area
188 sq mi (488
sq km)

Capital
Melekeok

**Form of
government**
Republic

Major town
Koror

Paleontology



A paleontologist marks dinosaur tracks on the surface of a desert.

Paleontology is the study of plants and animals that lived millions of years ago. Scientists called paleontologists study the remains of these ancient organisms, or living things. The remains, called fossils, were preserved in rocks.

Paleontologists look for fossils all over the world. They use special tools to carefully remove fossils from the surrounding rock. They note exactly where the fossils were found. This helps them figure out how old the fossils are.

Paleontologists can learn a lot about ancient living things by studying fossils. They can find out where an organism lived and what it looked like. They can identify what an organism ate and which animals killed it for food. They can also see how ancient animals and plants are related to animals that live today.

Paleontology shows how plants, animals, and other living things evolved, or

changed over time. Fossils help scientists to build models of dinosaurs, early humans, and other early animals. Paleontology can also tell scientists about how Earth itself has changed—for example, how climates were different in the past. Scientists use this information to understand events that are happening now and what might happen in the future.

Paleontology is similar to the science called archaeology. Like paleontologists, archaeologists study life in the past. But archaeologists focus on the remains of things that early humans made, such as tools and buildings.

► More to explore

Archaeology • Dinosaur • Evolution
• Fossil • Prehistoric Life

Did You Know?

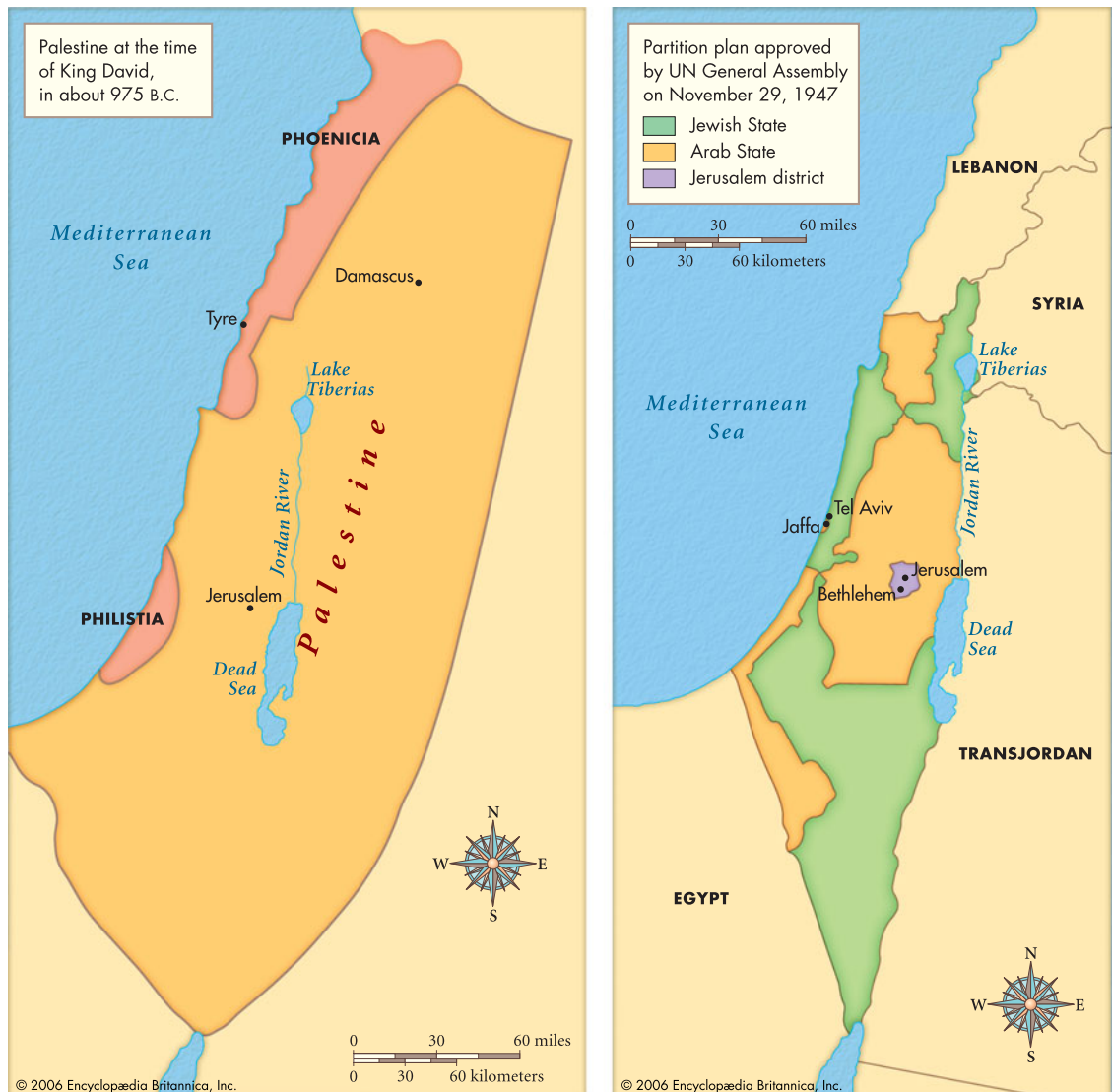
The word paleontology comes from the Greek words for “old” (*paleo-*), “being” (*-ont-*) and “study” (*-ology*)—meaning the study of old beings.

Palestine

Palestine is a region in the Middle East. It lies between the Jordan River and the Mediterranean Sea. Many different peoples have lived in Palestine over thousands of years. In 1948 most of Palestine became the country of Israel.

The Holy Land

Palestine is sometimes called the Holy Land. It is a sacred place for three major religions: Judaism, Christianity, and Islam. Palestine is important to Jews because the ancient kingdom of Israel was located there. It is important to Christians because Jesus lived and worked there. Palestine also has several sites that are holy to Muslims.



The boundaries of Palestine have changed through the years. When King David ruled Palestine in ancient times, its boundary was east of the Jordan River. In modern times most people think of Palestine as a smaller area. In 1947 the United Nations approved a plan to split Palestine into Jewish and Arab states, with Jerusalem in an international district. Israel was created in 1948.

Early History

Long ago Palestine was called Canaan. Tribes of people called Canaanites controlled the area for more than 1,000 years. In about 1500 BC Hebrew, or Jewish, tribes began to arrive. In about 1000 BC King David united these tribes in the kingdom of Israel. The capital of the kingdom was Jerusalem. In about 922 BC the kingdom split into two weaker

kingdoms. Both fell under the rule of more powerful neighbors.

During the time that Jesus lived, Palestine was part of the Roman Empire. By the AD 300s Christians ruled the eastern part of the empire, which included Palestine. Muslim Arabs invaded in the 600s. Muslims controlled Palestine for most of the time until the 1900s.

Modern Palestine

In 1917, during World War I, British forces took control of Palestine. Great Britain governed Palestine from the end of the war until 1948. During this period many Jews moved to Palestine from around the world. In 1948 Israel was created as a Jewish homeland.

The surrounding Arab countries did not like having a Jewish country in Palestine. They fought several wars with Israel. During the wars Israel took land from the Arabs. That land included two parts of Palestine called the West Bank and the Gaza Strip.

The Arabs who lived in Palestine before Israel was created are called Palestinians. After Israel was created, many Palestinians had to leave their homeland. Some started a movement to take back Palestine. In 1964 they formed the Palestine Liberation Organization (PLO). Palestinians sometimes attacked Israelis, who fought back. In the 1990s Israeli and Palestinian leaders began looking for a peaceful solution for sharing Palestine. However, fighting continued.

► More to explore

Christianity • Islam • Israel • Jerusalem
• Judaism • Middle East

Palestine Liberation Organization

The Palestine Liberation Organization (PLO) is a political group that represents



Yasir Arafat (left) of the Palestine Liberation Organization signs a peace agreement in 1998. With him are (left to right) King Hussein of Jordan, President Bill Clinton of the United States, and Prime Minister Benjamin Netanyahu of Israel.

the Palestinian people. The Palestinians are Arabs who live in the region called Palestine, at the eastern end of the Mediterranean Sea. They lost much of their land when the country of Israel was created in 1948. Since then the Palestinians have worked for the creation of an independent Palestinian state.

The PLO was formed in 1964. It brought various Palestinian groups together in one organization. In 1969 Yasir Arafat took control of the PLO. Beginning in the late 1960s the PLO launched many attacks against Israel. Its goal was to wipe out Israel as a country.

In the 1980s some people within the PLO moved away from the goal of destroying Israel. They believed that a Palestinian state could exist alongside Israel. In 1988 the PLO's leaders declared an independent Palestinian state. They also stated that Israel had a right to exist. Some Palestinian groups disagreed. They continued to call for Israel's destruction.

In 1993 the PLO and Israel took part in secret talks in Oslo, Norway. The talks led to a series of peace agreements. For the first time, Israel and the PLO each admitted that the other had a right to exist. Israel also agreed to gradually give up some of the Palestinian areas it controlled. A group called the Palestinian Authority was created to govern these areas. In 2005 Israel gave up the Gaza Strip and parts of the West Bank.

► More to explore

Israel • Palestine

Palikir

Palikir is the capital of the country named the Federated States of Micronesia. The country is made up of many small islands in the western Pacific Ocean. Palikir is located near the northern coast of Pohnpei Island. The town has several government buildings. The College of Micronesia has a campus just outside Palikir.

The islands of the Federated States of Micronesia were ruled by Spain, Germany, Japan, and then the United States. In 1986 Micronesia became an independent country.

► More to explore

Micronesia, Federated States of

Palm

Palms are plants of the tropics and other warm regions. There are about 2,800 different species, or kinds, of palm. They grow as trees, shrubs, or vines.



Palms are a common sight on tropical beaches.

A palm has a single trunk with a tuft of large leaves at the top. The trunk can be very tall, up to 200 feet (60 meters) high. Or it can be so short that the plant is almost trunkless.

Palm leaves can be shaped like fans or feathers. They are also called fronds. Some types of palm leaves are very long with prickly tips.

Palms produce dry or fleshy fruits that vary in size, shape, and structure. The date and the betel nut are soft, fleshy fruits. The fruit of the coconut palm is hard on the outside and has moist “meat” and liquid inside.

People of the tropics depend on palms for food, oils, shelter, clothing, timber, fuel, building materials, and more. Coconuts are one of the most valuable tropical crops. They provide oil for cooking. The fiber of the coconut husk, or outer covering, can be woven into ropes and mats. Coconut shells are used to make cups and bottles. The liquid in the center is called coconut milk.

► More to explore

Date • Fruit • Tree

Did You Know?

Palikir is not a residential town. That is, no one lives there.

Panama

The Central American country of Panama links the continents of North America and South America. The Panama Canal cuts through the country. It allows ships to travel easily between the Atlantic and Pacific oceans. Panama's capital is Panama City.

Geography

Panama is on the isthmus, or narrow strip of land, that connects North and South America. Panama borders Costa Rica to the west and Colombia to the east. The Caribbean Sea (part of the Atlantic Ocean) lies to the north. The Pacific Ocean is to the south. More than 1,600 islands are also part of the country.

Tall volcanic mountains extend across Panama. The country's highest peak is the inactive volcano Barú, in the west. Hundreds of rivers flow down from the mountains. The Panama Canal cuts through a low-lying region in central Panama. The country's climate is warm and rainy.

Plants and Animals

Tropical rain forests grow in the northwest and the east. Grasslands cover the dryer side of the country, next to the Pacific.

Panama has a rich mixture of animals from both North and South America. The South American animals include sloths, anteaters, and armadillos. The North American animals include jag-

uars, tapirs, and deer. Among Panama's birds are quetzals, hummingbirds, parrots, and flycatchers.

On Panama's border with Colombia is Darién National Park. It was established to protect the area's many plants and animals. The park covers about 2,305 square miles (5,970 square kilometers).

People

More than half of Panamanians are mestizos, or people with both European and American Indian roots. Many other people have African roots. The rest of the population is white, American Indian, or Asian.

Spanish is the most common language. Most of the people are Roman Catholics. Some people practice Santería, a religion that mixes Catholic and African beliefs. More than half of the population





A hut stands in the shade of some palm trees on a beach in Panama.

lives in cities or towns, especially in and around Panama City.

Economy

Services related to the Panama Canal are very important to Panama's economy. Other services include banking, insurance, and tourism.

Panama's factories make petroleum (oil) products, beverages, clothing, and cement. Farmers grow sugarcane, bananas, rice, corn, and oranges. Cattle and pigs are the main livestock. Shrimp is the most valuable product of Panama's fishing industry.

History

Hundreds of thousands of American Indians lived in the region when Spanish explorers arrived in 1501. The Spanish killed many Indians. They also brought in slaves from Africa. Panama became a center of trade. English pirates called buccaneers destroyed many Spanish settlements in the 1500s and 1600s.

In 1821 Panama gained independence from Spain. It joined a new union called Gran Colombia, which also included Colombia, Venezuela, and

Ecuador. When the union broke up in 1830, Panama remained part of Colombia.

In 1903 the United States helped Panama win independence from Colombia. Panama's new government gave the United States the right to build a canal through a strip of land called the Canal Zone. The Panama Canal opened there in 1914. The United States continued to control the Canal Zone.

Panama went through a long period of unrest. The government was overthrown many times. People also were angry at having U.S. troops in the Canal Zone. In the 1980s the military dictator Manuel Noriega took power. He did not allow anyone to question his rule. He also made money from selling illegal drugs.

In 1989 the United States invaded Panama and removed Noriega from power. Democratic government returned to the country. The United States gave Panama full control over the Panama Canal in 1999.

► More to explore

Central America • Panama Canal
• Panama City

Facts About PANAMA



Population
(2008 estimate)
3,310,000

Area
28,973 sq mi
(75,040 sq km)

Capital
Panama City

Form of government
Republic

Major cities
Panama City, San Miguelito, David, Arraiján, La Chorrera

Panama Canal



Large and small ships pass through one set of locks on the Panama Canal.

The Panama Canal is a waterway that connects the Atlantic and Pacific oceans. It cuts through a narrow strip of land in Panama, a country of Central America. Before the canal was built, ships traveling between the east and west coasts of North America had to go all the way around South America. The canal made the trip about 9,200 miles (14,800 kilometers) shorter.

The Panama Canal is about 40 miles (65 kilometers) long. It connects two of Panama's port cities. One is Colón, which lies on the Caribbean Sea, an arm of the Atlantic Ocean. The other is Balboa, on the Pacific. The canal runs through Gatún Lake and the much smaller Miraflores Lake.

Locks

The different parts of the canal are at different heights above sea level. Gated sections called locks raise and lower ships so they can pass from one water level to another. The canal has three sets of locks.

History

The Panama Canal was built in the early 1900s. In 1903 Panama gave the United States the right to build a canal through the country. It also gave the United States control of a strip of land called the Canal Zone. Building the canal was a huge job. At times more than 40,000 people worked on it. The canal took 10 years to build. It was opened to ships on August 15, 1914.

Even though the canal cut through Panama, the United States governed it through the 1900s. This situation caused much trouble between the United States and Panama. On December 31, 1999, the United States turned over the canal and the Canal Zone to Panama.

► More to explore

Atlantic Ocean • Canal • Pacific Ocean
• Panama

Panama City



Population
(2000 census),
city, 415,964;
(2005
estimate), urban
area,
1,216,000

Panama City is the capital of Panama, a country in Central America. It is Panama's largest city. It lies on a gulf of the Pacific Ocean. The Panama Canal is nearby. The canal links the Pacific and Atlantic oceans.



Panama City has mountains and the Pacific Ocean nearby.

The economy of Panama City depends largely on the canal. Many businesses in the city provide services to ships traveling on the canal and to canal workers. Panama City is also an important banking center.

An American Indian fishing village was once located on the site of Panama City. Spain took over the area in the 1500s. A Spanish soldier named Pedro Arias Dávila founded Panama City in 1519. Pirates destroyed the city in 1671, but the Spanish later rebuilt it.

In 1903 Panama became an independent country with Panama City as its capital. Soon afterward the Panama Canal was built. It was opened to world trade in 1914. Panama City then developed rapidly into a modern city.

► **More to explore**

Panama • Panama Canal

Pancreas

The pancreas is a part of the body's digestive system. It produces juices

called enzymes, which help the body to digest food. The pancreas also produces two kinds of hormones, or substances that control certain activities in the body. All animals that have a backbone have a pancreas.

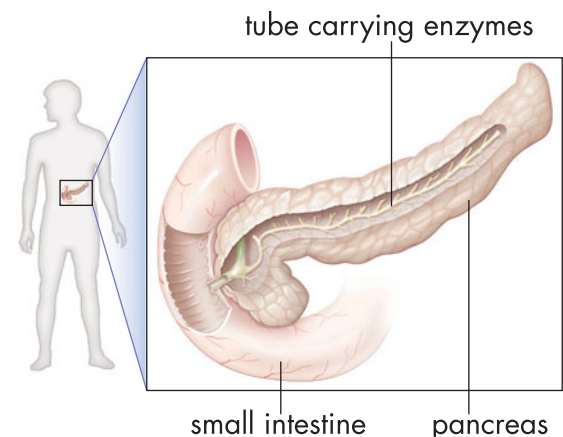
Structure

In human beings the pancreas is soft and yellowish. It is about 6 to 8 inches (15 to 20 centimeters) long and about 1 inch (2.5 centimeters) thick. It lies behind the stomach on the left side of the body.

Jobs of the Pancreas

When food enters the small intestine, the intestine releases hormones. These hormones cause the pancreas to produce digestive enzymes. The enzymes travel through tubes from the pancreas into the small intestine. There the enzymes help digest fats, starches, and proteins.

The pancreas also produces hormones. They are called insulin and glucagon. The job of these hormones is to control the amount of glucose, or sugar, in the blood. Glucose is the main source of energy for the body's cells.



Tubes carry enzymes from the pancreas to the small intestine.

Insulin moves through the bloodstream and helps cells throughout the body take the glucose they need from the blood. Glucagon does the opposite. It causes the liver to add glucose to the blood. Together these hormones keep glucose in the blood at a healthy level.

Problems with the Pancreas

Infections and cancer can affect the pancreas. One type of an illness called diabetes happens if the pancreas produces too little insulin. The lack of insulin means that the blood contains too much sugar. People with this type of diabetes must eat a diet low in sugar. They may also have to take medicines that contain insulin.

► More to explore

Diabetes • Digestive System • Enzyme
• Hormone

Panda

The name panda is used for two mammals that live in Asia: the giant panda and the lesser panda. Even though they share a name, the two animals look very different. The giant panda belongs to the bear family. The much smaller lesser panda is related to raccoons. Both the giant panda and the lesser panda are endangered species, meaning that they are in danger of dying out.

Giant Panda

The giant panda is found only in bamboo forests in central China. The giant panda has a bulky body and a round head. Its fur is white with black on the



The giant panda is found in bamboo forests in the mountains of central China.

shoulders, legs, and ears and around the eyes. Males grow to about 5 feet (1.5 meters) tall and weigh about 220 pounds (100 kilograms). Females are usually smaller.

Giant pandas usually live alone. They spend most of their time on the ground, but they can also climb trees. They eat mostly bamboo. Wild pandas spend up to 16 hours each day eating up to 40 pounds (18 kilograms) of bamboo. In zoos they also eat grains, fruits, and vegetables.

Lesser Panda

The lesser panda lives in high mountain forests in China, Myanmar, and Nepal. It is also called the red, or common, panda. It has thick reddish brown fur and a long, bushy tail like a raccoon's. The lesser panda only grows to about 20 to 26 inches (50 to 65 centimeters) long, not including the tail. It weighs



The lesser panda looks more like a raccoon than a bear.

about 6 to 10 pounds (3 to 4.5 kilograms). Its face is white, with a red-brown stripe running from each eye to the corners of the mouth.

Lesser pandas travel in pairs or small family groups. They eat bamboo and other plants, fruit, and sometimes small animals. They feed on the ground at night. During the day they sleep in trees.

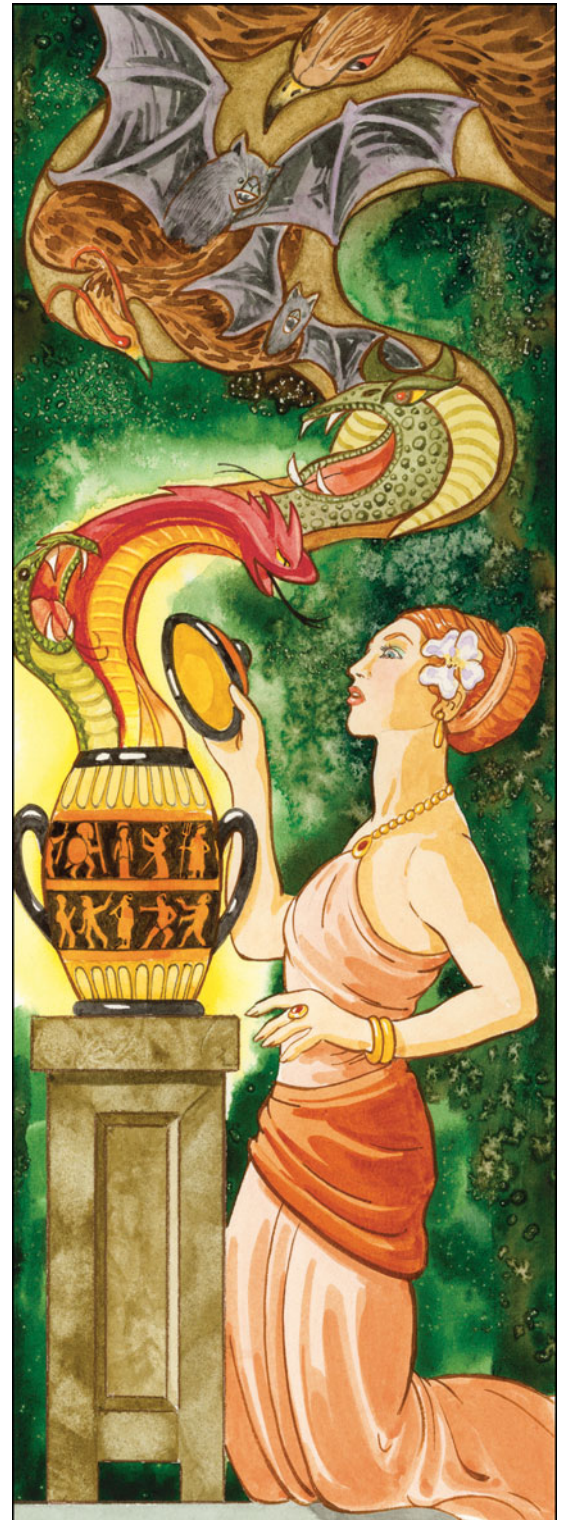
► More to explore

Bamboo • Bear • Endangered Species
• Mammal • Raccoon

Pandora

In ancient Greek mythology Pandora was the first woman on Earth. Her story begins with the fire god Prometheus. Prometheus stole fire from the gods and gave it to humans. This angered Zeus, the ruler of the gods. He plotted to punish humans.

Zeus ordered Hephaestus, the god of fire and craftsmen, to make Pandora out of earth. Each god then contributed some-



Pandora was the first woman on Earth according to ancient Greek mythology. When she opened a jar (known as Pandora's box) troubles flew out into the world.

thing to her. For instance, Aphrodite, the goddess of love, gave her beauty.

Zeus then sent Pandora to Earth. There she found a mysterious jar—which is sometimes called Pandora’s box. Pandora was warned not to open the jar. But she was overcome by curiosity. According to one story, as she lifted the lid, all kinds of evils flew out. She replaced the lid, but it was too late. Troubles had already covered the world. The only thing left in the jar was hope.

► **More to explore**

Greece, Ancient • Mythology
• Prometheus • Zeus

Panther

► see Leopard.

Papacy

► see Pope.

Papago

► see Tohono O’odham.

Papaya

Papayas are tropical fruits. They look like small cantaloupes or honeydew melons. In some places papayas are called papaws or pawpaws. The scientific name of the papaya plant is *Carica papaya*.

Papayas grow in tropical areas around the world. The papaya plant is as tall as a tree. Some papaya plants reach 26 feet (8 meters) in height. Their leaves can be as big as 2 feet (0.6 meter) across.



A papaya fruit contains many small seeds.

Papaya fruits are usually yellow or orange. Some types remain green when ripe. Papayas are about 3 to 20 inches (7.6 to 51 centimeters) long. They can weigh as much as 20 to 25 pounds (9 to 11 kilograms). The inside of a papaya is very juicy. In the center are many round, wrinkled black seeds.

Papayas have a slightly sweet taste. They are also a good source of vitamins A and C. Many people eat papayas at breakfast. Papayas are also used to make salads, jellies, pies, and juices.

► **More to explore**

Fruit • Melon

Paper

Paper is a thin material that people use for writing, printing, wrapping, and many other purposes. People usually make paper out of natural fibers, or long, thin strands of plant material. Today most paper contains wood fibers, called wood pulp.

How Paper Is Made

Hundreds of years ago people made paper by hand. Today machines produce most paper. But the papermaking process remains much the same. First, the wood fibers are soaked in water. This creates a soupy mixture. Next, this mixture is spread on a screen. The fibers stick to the screen and bond together while the water drains through it. Rollers then press out more water. The fibers also may be dried with heat. Once the fibers are dry, they have become a sheet of paper.

The paper may be pressed again to flatten and smooth it. Machines also may coat the paper with chemicals to make it better for printing or other purposes.

Types and Uses

There are many different types, or grades, of paper. Everyday writing and printer paper, called bond, is thin and smooth. Some paper, especially paper used for arts and crafts, is thicker and sometimes textured. Cardboard is a rough, thick type of paper used to



Modern paper mills have equipment to make large amounts of paper very easily.



After paper has dried it can be peeled off the screen that it formed on.

make boxes and other packaging. Paper used for newspapers, called newsprint, is thin and cheap. Recycled paper is made from used paper or leftover bits of new paper.

Paper has many other practical and creative uses. People use paper to make books, cards, gift wrap, money, egg cartons, and hundreds of other items.

History

People in China made the first paper almost 2,000 years ago. This early paper was made from linen fibers, ground up mulberry bark, and other materials. From China the art of papermaking slowly spread throughout the world.

Until the early 1800s people usually made paper from rags and other cloth fibers. Then they began to use wood pulp. At about this time people also began to use machines to make paper.

► More to explore

Book and Bookmaking • Fibers
• Recycling

Papua New Guinea



Masked warriors dance at a gathering of some of the many different peoples of Papua New Guinea.

Papua New Guinea is an island country in the Pacific Ocean. Port Moresby is the capital and largest town.

Papua New Guinea lies north of Australia. Most of the country's land is on the eastern half of the island of New Guinea. (Papua, a province of Indonesia, takes up the western half.) About 600 smaller islands make up the rest of the land. Tall mountains rise on the main island. Papua New Guinea's climate is warm and rainy.



Rain forests cover much of the land. Pine, oak, and cedar trees grow in the higher regions. The country's animals include tree kangaroos, wallabies, and egg-laying mammals called echidnas.

More than 700 different ethnic groups live in Papua New Guinea. The groups are divided into two categories: Papuan and Melanesian. Papuans make up most of the population. They live mainly on the island of New Guinea. Melanesian peoples live near the coasts and on other islands. English, Tok Pisin, and Motu are common languages. Most of the people are Christians.

Mining is an important part of the economy. The country has deposits of gold, copper, oil, and coal. However, most of the people are farmers. Crops include coffee, cocoa, coconuts, bananas, sweet potatoes, tea, and oil palm fruit.

Humans first came to the islands thousands of years ago. In 1884 Germany and Great Britain divided the islands between themselves. Australia took control in the 1900s.

In 1975 Papua New Guinea gained independence. It joined the Commonwealth, a group of countries with ties to Britain.

► More to explore

Echidna • Indonesia • Port Moresby



Facts About PAPUA NEW GUINEA



Population
(2008 estimate)
6,474,000

Area
178,704 sq mi
(462,840 sq km)

Capital
Port Moresby

Form of government
Constitutional monarchy

Major cities
Port Moresby,
Lae, Madang,
Wewak, Goroka



Paraguay

The country of Paraguay in South America is landlocked, or surrounded by land. However, Paraguay has many rivers that flow to the Atlantic Ocean. The name Paraguay came from an American Indian word meaning “river that gives birth to the sea.” Paraguay’s capital is Asunción.

Geography

Paraguay borders Bolivia, Brazil, and Argentina. The Paraguay, Apa, Paraná, and Pilcomayo rivers run along most of the country’s borders.

The Paraguay River also runs through the center of Paraguay. West of the river is a dry, flat region called the Chaco Boreal. Few people live there. East of the river are wooded hills and grassy plains. The country’s highest peak is Mount San Rafael in the southeast. Paraguay’s summers are hot and rainy. Winters are warm and fairly dry.



Plants and Animals

The trees in eastern Paraguay are mostly evergreens. The leaves of one type of tree are used to make yerba maté, a popular tea in South America. Cacti, thorny shrubs, and quebracho trees grow in the west. The bark of the quebracho tree contains a substance called tannin, which is used in making leather.

Animals found in Paraguay include monkeys, armadillos, anteaters, otters, boars, tapirs, and jaguars. Brightly colored parrots, toucans, and other birds live in the forests. Snakes and iguanas are also common.

People

Most of Paraguay’s people are mestizos, or people with a mixture of Spanish and American Indian roots. Spanish and Guaraní are the main languages. About 90 percent of the population is Roman Catholic. More than half of the people live in cities or towns. Almost all of Paraguay’s people live in the east.

Economy

Paraguay’s economy is based on agriculture. The country sells soybeans, meat, and cotton to other countries. Many farmers, however, grow only enough food for their own families. Cassava, sugarcane, corn, oranges, sweet potatoes, and bananas are important crops. Cattle are the main livestock.



Dancers in Paraguay wear colorful clothing.

Paraguay's industries make soybean oil, sugar, cloth, leather goods, and wood products. Dams on Paraguay's rivers produce electricity.

History

Guaraní Indians lived between the Paraguay and Paraná rivers long before Europeans arrived in the 1520s. Spanish

settlers mixed peacefully with the Guaraní. Beginning in 1776 Spain ruled Paraguay as part of a territory called Río de la Plata. In 1811 Paraguay declared its independence.

In the 1860s Paraguay fought a war against Argentina, Brazil, and Uruguay. When the fighting ended in 1870, Paraguay had lost more than one third of its population. During 1932–35 Paraguay fought the Chaco War with Bolivia. Both countries wanted the same land in the Chaco region. Paraguay won most of the Chaco territory.

In 1954 General Alfredo Stroessner seized power in Paraguay. The military finally forced Stroessner to step down in 1989. In the 1990s Paraguay returned to democracy. However, the country still faced many problems.

► More to explore

Asunción • Bolivia

Facts About PARAGUAY



Population
(2008 estimate)
6,238,000

Area
157,048 sq mi
(406,752 sq km)

Capital
Asunción

Form of government
Republic

Major urban areas
Asunción, Ciudad del Este, Encarnación, Pedro Juan Caballero, Caaguazú



The Itaipú Dam on the Paraná River is one of the largest hydroelectric (waterpower) projects in the world. The dam was built by Paraguay and Brazil.

Paramaribo



Population
(1996 estimate)
222,800

Paramaribo is the capital of Suriname, a small country on the northern coast of South America. The city lies on the Suriname River near where it flows into the Atlantic Ocean. It is Suriname's largest city and main port. More than half the country's people live in Paramaribo.

Factories in Paramaribo make paint, margarine, cement, and beer. Shipping goods through the port is also important to the city's economy. The fishing industry catches shrimp, which is sold to North America. Tourism also brings money to the city.

Paramaribo began as an American Indian village. The French built a settle-



Paramaribo still has many buildings from when the Dutch ruled Suriname.

ment there in about 1640. In 1651 the English made it a colony. The Dutch took control of Paramaribo and the rest of Suriname in 1667. In 1975 Suriname became an independent country with Paramaribo as its capital.

► More to explore

Suriname

Parasite

A parasite is an organism, or living thing, that lives on or inside another organism. It depends on the other organism for food and other things that it needs to live. The parasite's victim is called its host. The host is usually much larger than the parasite.

Different kinds of parasites have different effects on their hosts. Some parasites cause disease. Others cause pain. Others are almost never noticed by their hosts. However, the basic relationship is always the same—good for the parasite, harmful for the host.

Kinds of Parasites

Parasites occur among all the major groups of living things. Viruses, bacteria, protozoans, fungi, plants, and animals all may live as parasites.

All viruses and many bacteria are parasites. They live inside cells of the host's body. Diseases caused by viruses include measles, chicken pox, and AIDS. Parasitic bacteria cause diseases ranging from acne to the plague.



The mistletoe plant is a parasite because it digs its roots into a tree branch and takes food from the tree. But mistletoe also makes some food for itself.

Protozoans are one-celled organisms that may live either on their own or as parasites in animals. About one third of the thousands of types of protozoans are parasitic. The protozoans of the scientific group *Plasmodium* cause the disease malaria.

Parasitic fungi attack both plants and animals. Rusts, mildews, and smuts are parasitic fungi that cause diseases in plants. In humans, parasitic fungi cause the skin conditions called ringworm and athlete's foot.

Some types of plants live as parasites on other plants. For example, mistletoe grows on trees and uses them for support. It also gets some nutrients from the trees.

Parasitic animals live either on or inside the host. Certain worms make up one

large group of animal parasites. Many live in their host's digestive system and feed on the food that passes through. Fleas and lice are parasitic insects that live on the bodies of mammals or birds.

How Parasites Are Spread

Parasites can be spread from one host to another through the air, contaminated water or food, or feces. Some parasites rely on a third organism to spread them to their host. *Plasmodium* protozoans, for example, are spread through the bites of certain mosquitoes. Other parasites pass through more than one host. The roundworms that cause the disease called trichinosis are an example. Pigs are their first host, and the humans that eat the meat of the pigs are their second host.

► More to explore

Disease, Human • Living Thing
• Symbiosis

Paris



Population

(2005 estimate), city, 2,153,600; urban area, 9,854,000

Paris is the capital of the country of France. It has long been one of western Europe's major centers of culture and business. Some of the world's greatest artists, writers, scholars, fashion designers, and chefs have lived in Paris.



The Eiffel Tower rises above Paris.

The city is also famous for its beauty. The Seine River flows through the city center.

Places of Interest

Paris has many famous landmarks. The soaring curves of the Eiffel Tower can be seen from far away. It has become a symbol of the city. The Arc de Triomphe is a large arch honoring the military. The cathedral of Notre Dame is a church

built from the 1100s to the 1300s. It is known for its windows of colored glass and its tall stone arches.

The most important of Paris' many museums is the Louvre. It has a huge collection of art, including Leonardo da Vinci's painting of the *Mona Lisa*.

Economy

Many large companies have headquarters in Paris. It is a major banking center. Tourism, government, insurance, and other service industries are also important to the economy. Factories in the city make clothing, jewelry, and cosmetics.

History

Paris began on an island in the Seine River. A people called the Parisii founded a town there more than 2,000 years ago. The Romans captured the



Visitors can see the sights of Paris from boats on the Seine River.

town in 52 BC. The town later spread onto the riverbanks.

In AD 987 Paris became the capital of France. The city and its economy grew. In the 1300s, however, a disease called the plague killed many of its people.

Paris began to grow again in the late 1500s. The major events of the French Revolution took place in the city in the late 1700s. Paris was then the site of great violence. In the 1800s construction projects made Paris more modern and beautiful.

German troops took control of Paris in the 1940s, during World War II. After the war the city rebuilt its economy. In the late 20th century large building projects added new landmarks to the French city.

► More to explore

Eiffel Tower • France • French Revolution

Parkinson's Disease

People with Parkinson's disease slowly lose control of their muscles. The disease causes tremors, or shaking. It usually affects people who are in their 60s or 70s. It is named for a British doctor named James Parkinson. He first described the disease in 1817.

The early symptoms, or signs, of Parkinson's disease include weakness and tiredness. A person's hands may shake. As



The boxer Muhammad Ali and the actor Michael J. Fox suffer from Parkinson's disease. Both men have supported efforts to find a cure.

time passes, the arms and legs become stiff. The person's handwriting gets smaller. It becomes hard to speak. Walking becomes a shuffling movement.

No one is sure what causes Parkinson's disease. Some scientists think that it is caused by harmful chemicals. Others think that the disease runs in families.

Scientists do know how Parkinson's disease affects the brain and the body. For some reason nerve cells in the brain begin to die. These cells normally make a chemical called dopamine. Dopamine helps control movement. When the amount of dopamine is low, a person loses control over the body's movements.

There is no cure for Parkinson's disease. There is also no way to prevent it. However, doctors can treat the symptoms. Certain medications help create dopamine. Others slow down its loss. These

medications can temporarily ease the effects of the disease. Physical therapy may also help. In some cases doctors can perform surgery.

► More to explore

Brain • Disease, Human • Muscle

Parks, Rosa

In 1955 Rosa Parks refused to give up her seat on a Montgomery, Alabama, city bus to a white person. Her action sparked the U.S. civil rights movement.

Early Life

Rosa Parks was born Rosa Louise McCauley on February 4, 1913, in Tuskegee, Alabama. As an African American in Alabama, she had to live with segregation, which means separation of the races.



Rosa Parks sits on a bus in Montgomery, Alabama, in 1956.

Rosa married Raymond Parks in 1932. After her marriage she joined the National Association for the Advancement of Colored People (NAACP). The NAACP worked to make life better and fairer for African Americans. Parks became a leader of the NAACP branch in Montgomery.

The Bus Ride

On December 1, 1955, Parks was riding a then segregated Montgomery city bus. She was sitting in a section where whites had first pick of seats. A white man wanted her seat, but Parks refused to move. She was arrested, jailed, and fined.

The city's African Americans then decided to boycott, or not ride city buses until the segregation law was changed. The boycott was led by Martin Luther King, Jr., who was then just beginning his career as a civil rights leader.

The Montgomery boycott went on until 1956, when the U.S. Supreme Court decided that the U.S. Constitution did not allow segregation of buses. This gave hope to people who wanted all kinds of racial segregation to end. Within the next 10 years much progress was made.

Later Life

Parks was fired from her job and threatened by white people. She and her family moved to Detroit, Michigan, in 1957. She then worked in the office of U.S. Representative John Conyers, Jr. She was honored with two of the country's highest civilian awards: the Presi-

dential Medal of Freedom (1996) and the Congressional Gold Medal of Honor (1999). Rosa Parks died in Detroit on October 24, 2005.

► More to explore

African Americans • Civil Rights Movement • King, Martin Luther, Jr. • National Association for the Advancement of Colored People

Parliament

Parliament is the legislature, or lawmaking group, in the government of the United Kingdom (Great Britain). The government leader, called the prime minister, is always a member of Parliament. This makes Britain different from the United States, which keeps Congress and the president in separate branches of government.

Other countries that Britain once ruled have parliaments also. Australia, New Zealand, Canada, and India are among the former British colonies that have parliaments.

Britain's Houses of Parliament

Britain's Parliament consists of two houses: the House of Lords and the House of Commons. There are about 700 members in the House of Lords, but not all of them participate. There are 646 members in the House of Commons.

For many years most members of the House of Lords were nobles, or people born into the upper classes. These people inherited their seats in the house.



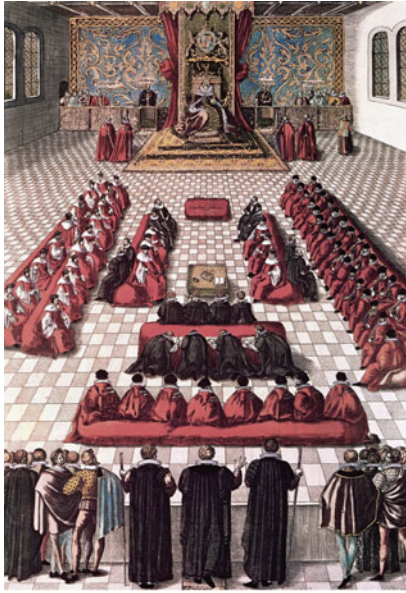
The prime minister of Canada (standing) answers questions from members of the House of Commons. The House of Commons is one part of the Canadian Parliament.

Since 1999 the house has been made up mainly of people chosen by the government for outstanding achievement. Senior judges and senior clergy (church leaders) of the Church of England are also members. The member in charge of the House of Lords is called the lord chancellor.

Members of the House of Commons are elected by the people. The ruling party schedules elections, but there must be an election at least once every five years. The member who leads the ruling party serves as prime minister. The heads of government departments, called the Cabinet, are also members of Parliament. A member called the speaker controls the debates, or arguments, in the house.

How the British Parliament Works

The main function of the House of Commons is to make laws. First a



An illustration shows Queen Elizabeth I at the head of England's Parliament. Elizabeth ruled over England, which is now part of the United Kingdom, from 1558 to 1603.

member—usually a Cabinet member—proposes a law. The members debate the proposed law, or bill. If the members agree, the bill goes to a committee. The committee sometimes makes changes. The committee then sends the bill back to the House of Commons. If the house approves the bill, it sends it to the House of Lords. The Lords may approve the bill or make changes and send it back to the Commons.

Once both houses have approved a bill, it becomes law after the monarch (king or queen) agrees to it. Modern monarchs agree to all bills Parliament passes.

Bills also can start in the House of Lords, but this rarely happens. In addition, it is possible for a bill to become law without being passed by the Lords.

For example, if the House of Lords does not approve a bill, it can become law if the House of Commons passes it again one year later.

History

The beginnings of the British Parliament have been traced back to the witenagemot. This was a council of advisers to Britain's Anglo-Saxon kings. Modern Parliament developed from meetings of nobles and important people in the 1200s. Over time the power of Parliament grew. In 1689 Parliament passed a law that became known as the Bill of Rights. This act gave Parliament power over the monarch.

► More to explore

Congress of the United States • Law
• Legislature • United Kingdom

Parrot Family

Most of the birds of the parrot family are known for their colorful feathers, noisy calls, and curved beaks. They are among the world's most popular pet birds. They are smart and very social, and they tend to live a long time. Some types, such as the African gray parrot, are excellent at imitating human speech.

This scientific family includes many birds besides parrots. Among them are macaws, lovebirds, lorries, lorikeets, keas, and parakeets, including the budgerigar, or budgie. Cockatoos and cockatiels belong to a closely related family. People often call the birds of both these families parrots.

Where Birds of the Parrot Family Live

Parrots and their relatives are found mainly in the southern half of the world. Most of these birds live in warm or hot rain forests.

Physical Features

The birds of the parrot family vary greatly in size—from 3 to 40 inches (8 to 100 centimeters) in length. Several types of parrot are mostly bright green. Red, yellow, and blue feathers are also common. However, cockatoos are mainly white, black, pink, or gray. They often have tufts of feathers, called crests, on their heads.

Parrots and their relatives have sturdy bodies and short necks. Two of the toes on each foot point forward, and the other two point backward. Their feet are useful for both climbing and grasping. These birds also use their thick, hooked bills to help them climb trees. Their strong bills can crack open hard nutshells, too. They eat mainly seeds, nuts, and fruits.

Endangered Birds

Many types of these birds are in danger of dying out completely. People have cut down the trees in many forests where parrots live in order to use the land for farms, houses, or businesses. In addition, people catch many of these endangered birds to sell as pets—even though this is against the law.

► More to explore

Bird • Endangered Species • Pet

Parsiism

► see Zoroastrianism.

Passover

In Judaism, Passover (or Pesach) celebrates the freedom of the Jews from slavery in ancient Egypt. Thousands of years ago the early Jews, called Israelites, moved to Egypt, where they became slaves of the Egyptians. It is believed that Moses was chosen to go to the pharaoh, or king of Egypt, to demand that he free the Israelites from slavery. The pharaoh said no, so God sent down 10 plagues (or punishments) to force the king to change his mind. The word Passover comes from the 10th plague, in which the firstborn sons of the Egyptians were killed. The Israelites were spared from the plague because Moses had told them to mark their door posts so that the angel of death would pass over them. The son of Egypt's pharaoh died from the plague. In his grief the pharaoh ordered Moses and the Jews to leave Egypt.

Did You Know?

Passover is celebrated for seven or eight days beginning on Nisan 15 of the Hebrew calendar.



Brightly colored lorikeets perch on the branch of a tree.



Families and friends often gather for a meal called a seder to celebrate Passover.

The festival of Passover is one of great joy. It takes place for about one week in March or April. A special family meal called a seder is held the first and sometimes the second night of Passover. Before the meal the story of Passover is told through the songs and prayer of the Haggadah, which is the book used during the seder. The most important food of the holiday is matzo, which is a bread made with only flour and water. It is unleavened, which means that it is flat. This reminds the Jews of the bread the Israelites took with them when they fled Egypt for freedom. They did not have time to let it rise because they were in a hurry to leave.

► More to explore

Judaism

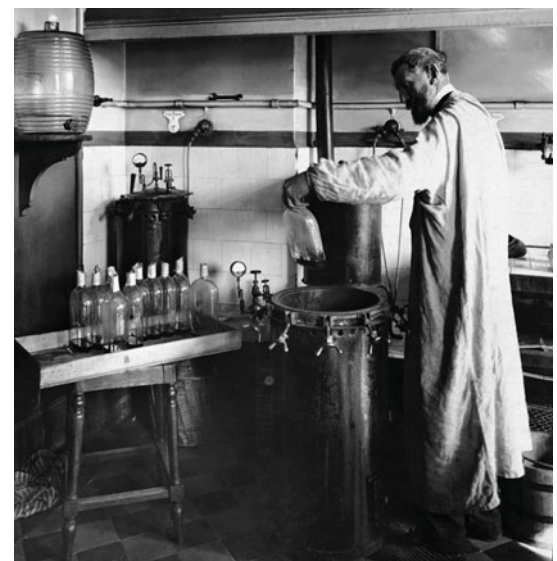
Pasteur, Louis

Louis Pasteur was a French scientist who made important discoveries about the role of microbes (germs) in disease and in food spoiling. These discoveries have saved many lives. They have also made

food safer to eat and protected the health of farm animals. Pasteur was a courageous scientist who constantly asked questions, searched for answers, and challenged incorrect ideas.

Pasteur was born on December 27, 1822, in Dole, France. He received a Doctor of Science degree in 1847. He then taught chemistry at French universities.

While working at the University of Lille, Pasteur discovered that fermentation involved microbes. Fermentation is a chemical change used to make bread, wine, cheese, and other foods. Pasteur showed that heat killed the microbes that cause fermentation. This discovery led to his invention of a process for destroying harmful microbes in food. This process became known as pasteurization. It slows down the spoiling of food. Pasteurization is still used today, especially to make milk safe to drink.



Louis Pasteur performs a scientific experiment in a laboratory.

Pasteur discovered that many diseases are caused by microbes. He developed a method of preventing disease called vaccination. Vaccination involves putting weakened germs into an animal's or person's body. The weakened germs do not make the animal or person sick. Instead, the body "learns" how to fight off the disease caused by that germ.

In 1881 Pasteur successfully vaccinated sheep against a disease called anthrax. He also developed a vaccination against rabies. Pasteur died on September 28, 1895, in Saint-Cloud, France.

► More to explore

Disease, Human • Fermentation
• Vaccine

Pawnee

The Pawnee are Native Americans of Oklahoma. They traditionally lived on the plains of what is now the U.S. state of Nebraska.

The Pawnee lived in large, dome-shaped homes called lodges. They made their lodges using earth, or dirt. Each lodge was large enough for related families. The Pawnee grew corn, beans, squash, and pumpkins. They also hunted bison (buffalo). The Pawnee lived in tepees covered with bison skins while on the hunt.

Spanish explorers arrived in Pawnee lands in the 1500s. In the 1600s and 1700s the Pawnee got horses from the Spanish. They used the horses to hunt



A photograph from the late 1800s shows Pawnee men wearing traditional clothing.

bison. However, unlike other tribes of the Great Plains, they continued to farm for much of their food.

The Pawnee generally had a peaceful relationship with white settlers. Many Pawnee worked for the U.S. Army. But diseases brought by the settlers, such as smallpox, killed many Pawnee.

In the middle of the 1800s the Pawnee turned over their Nebraska land to the U.S. government. In 1876 the government moved the Pawnee to a reservation in Indian Territory (now Oklahoma).

At the end of the 20th century there were about 2,500 Pawnee. Most lived on or near the Oklahoma reservation.

► More to explore

Native Americans

Payton, Walter



Walter Payton was a running back for the Chicago Bears.

Walter Payton was one of the best professional football players in the United States. As a running back for the Chicago Bears, Payton set many records. His impressive abilities quickly made him a superstar.

Walter Jerry Payton was born on July 25, 1954, in Columbia, Mississippi. He was the youngest of three children. He began playing football as a junior in high school.

Payton went on to attend Jackson State University in Jackson, Mississippi. There he earned the nickname Sweetness for his charming personality and his graceful athletic style. While at Jackson State, Payton set a National Collegiate Athletic Association record for most points scored. Payton graduated in 1975 with a degree in special education.

In 1975 Payton joined the Chicago Bears of the National Football League.

He played with the Bears for his entire career. While playing for the Bears, Payton set one record after another. Most of the records were for rushing, or gaining yards toward the goal while carrying the ball. Payton also made 125 touchdowns during his career.

Payton retired at the end of the 1987 football season. He was elected to the Pro Football Hall of Fame in 1993. After his retirement, Payton worked with several charities, helped to open a restaurant, and set up his own business, the Payton Power Equipment Company. Payton died of a rare liver disease on November 1, 1999, in Barrington, Illinois.

► More to explore

Football

Pea

Peas are small, round vegetables. They are high in protein and full of vitamins. Peas are among the oldest plants grown



Peas are considered members of the legume family because they have seeds that grow inside pods.

in the world. They belong to the family of plants called legumes. Beans, peanuts, and clover are other examples of legumes.

Many types of pea plant are grown throughout the world. They are hardy and leafy. Most like well-drained soil, cool temperatures, and warm sun. The climbing stem of a pea plant may reach up to 6 feet (1.8 meters) in length. The plant produces reddish purple, pink, or white flowers. Peas are annuals, meaning that they need to be replanted each year.

Peas grow in what is called a pod. A pod grows to about 4 inches (10 centimeters) long. Inside are 5 to 10 seeds, or peas. The seeds can be smooth or wrinkled, and they can be green, yellow, or white in color. The pea pods split in half when they are ripe, or ready to be eaten.

Most pods are valued only for the peas inside. But some varieties, including snap and snow peas, have pods that are eaten. Peas are sold fresh, dried, canned, and frozen.

► More to explore

Bean • Legume • Peanut

Peace Corps

The organization called the Peace Corps promotes good feelings between the United States and countries around the world. The U.S. government runs the Peace Corps. People who work in the Peace Corps go wherever they are



A Peace Corps volunteer teaches a class in Paraguay.

needed in the world. They build schools, teach important skills, and do many other types of work. Members of the Peace Corps include U.S. volunteers and people from the countries that host the volunteers.

Background

The Peace Corps was created in 1961 under President John F. Kennedy. Kennedy's brother-in-law Sargent Shriver oversaw the program.

The number of volunteers has varied over time. In 1966 there were more than 15,000 Peace Corps workers. By the early 21st century there were fewer than 8,000 volunteers.

Volunteers have to be at least 18 years old. They sign on for a two-year term of service. They get three months of training and money for food and shelter. Volunteers are also rewarded in other ways. They learn new languages and customs. They often make lifelong friends.

Goals

The Peace Corps has three main goals. The first goal is to help people in other countries meet their needs. The second goal is to help the host countries better understand people from the United States. The third goal is to help the United States better understand people in other countries. All these goals are meant to help bring about world peace.

The Peace Corps Today

The Peace Corps has served in about 140 countries. More than 170,000 people have worked as volunteers. Today most Peace Corps volunteers have college degrees. Most are single women under the age of 30.

The services provided by the Peace Corps change according to countries' needs. In the past many volunteers worked as teachers and farmers. Today many developing countries also need help with computer skills. Other fields include health, trade, and community development.

► More to explore

Kennedy, John F. • United States

Peace Movements

War has been a constant part of history. People throughout the world hope for peace, but it is hard to achieve. Since the 1800s groups of people have started organized movements to try to make the dream of peace a reality.

Those who oppose war for any reason are called pacifists. Before peace movements started, some religious groups already opposed all wars. Buddhists think all violence is wrong. Many Christians, including Anabaptists, Mennonites, and Quakers, are also pacifists.

The first nonreligious peace movement started in the United States in 1815. By the late 1800s people around the world were forming groups that supported peace. The horrors of World War I (1914–18) led people and even governments to form peace groups. Forty-two countries set up the League of Nations in 1920 to maintain world peace. After World War II (1939–45) the United Nations replaced the League.

When enemies attack and citizens die, peace movements often lose strength. For example, many people in the United States did not want to join World War II

Did You Know?

Siddhartha Gautama, known as the Buddha, taught that it is wrong to harm any living creature.



War protesters in the Philippines carry a big peace sign in 2003. The peace sign was first used in the United Kingdom but is now recognized around the world.

when it first began. However, after the Japanese bombed Pearl Harbor in 1941, most Americans wanted to fight.

Even during unpopular wars, peace movements may be criticized. For instance, in the 1960s young people around the world formed a peace movement to stop the Vietnam War. Many U.S. citizens, however, felt that the protesters were being disloyal to their country. In 2003 many Americans also disagreed with the peace movement to stop the U.S.-led war in Iraq.

Still, in the late 20th and early 21st centuries most countries agreed that peace was an important goal. Many governments agreed to limit the buildup of nuclear weapons. They also looked for ways to fight terrorism, another threat to world peace.

► More to explore

United Nations

Peach

Peaches are fruits that have fuzzy skins. There are thousands of varieties of peaches. They are among the most widely eaten fruits in the world.

Peach trees grow where the weather is mild. The United States is a major producer of peaches. They grow in such states as California, Washington, South Carolina, and Georgia.

Peach trees can be 21 feet (6.5 meters) tall. Most farmers only let the trees grow to about 10 to 13 feet (3 to 4 meters).



Peaches are often a light orange color, but they can also be yellow, red, or white.

This makes it easier to pick the fruit. Flowers appear in spring. They may be white, pink, red, or purplish. The peach fruits grow from these flowers.

Farmers plant peach trees in orchards. When the fruit begins to develop, farmers cut down some of the tree branches. This helps the fruit left on the tree grow larger.

Peach fruits, or peaches, are round. They are about 3 inches (7.6 centimeters) across. Peaches may be yellow, orange, red, or white. Their skin is usually fuzzy, but some peaches are smooth. These are called nectarines. In the center of a peach is a large stone called a pit. The pit contains a single, oval-shaped seed.

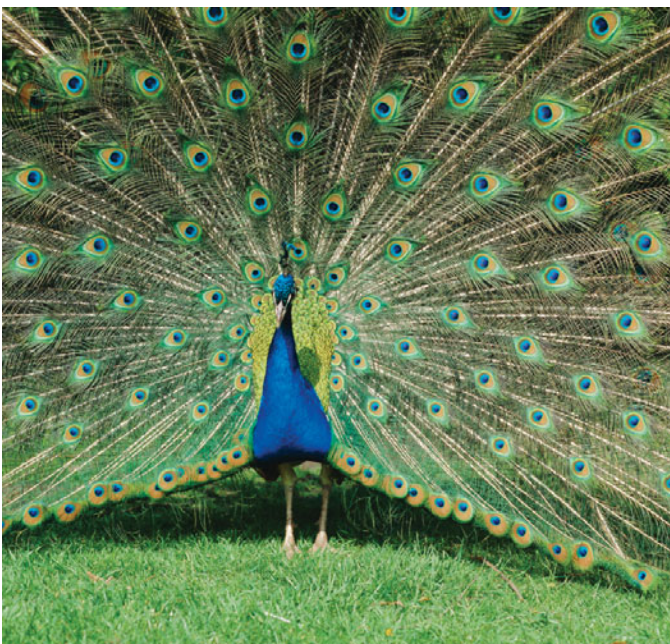
People eat peaches fresh. They also use peaches to make jams, pies, cobblers, and other desserts. Peaches are sometimes canned.

Peacock

Peacocks are known for their huge fan of colorful tail feathers, called a train. People have kept these beautiful blue and green birds for thousands of years. Sometimes the word peacock is used to describe only the male bird. The female is called a peahen.

Peacocks belong to the pheasant family, Phasianidae. There are three species, or types, of peacock—the blue (or Indian) peacock, the green (or Javanese) peacock, and the Congo peacock. The only peacocks that have a train of tail feathers are the males of the blue and green types.

Peacocks usually live in lowland forests. At night they sleep in trees. The blue peacock comes from southern Asia, while the green peacock comes from southeastern Asia. The Congo peacock is found in central Africa.



A male peacock shows its fine tail feathers.

In both the blue and green types, the male's body is about 35 to 50 inches (90 to 130 centimeters) long. Its train of metallic green tail feathers is about 60 inches (150 centimeters) long. Each tail feather has a shining spot at the end of the feather that looks like an eye. A crest, or tuft of feathers, tops the male's head. The peahen of both these species is green and brown. It is almost as big as the male.

Male blue and green peacocks put on a showy display when trying to attract mates. The peacock lifts its train and spreads it like a fan. It then struts about and shakes its train, making the feathers shimmer and rustle.

The Congo peacock is mainly blue and green. Its tail is short and rounded. The peahen is reddish and green.

► More to explore

Bird

Peanut

Peanuts are not true nuts. They are the legumes, or pods, of the peanut plant. Because peanuts ripen underground, they are sometimes called groundnuts. The peanut plant's scientific name is *Arachis hypogaea*. It belongs to the pea family, which also includes peas, beans, and clovers.

Peanuts are grown in warm areas throughout the world. They grow best in sandy soils. China, India, the United States, and Nigeria grow most of the world's peanuts.



People crack the shells of peanuts to eat the seeds inside.

The peanut plant is a low bush. Some plants grow short branches and have an upright stem. Others have a shorter stem but grow long branches, called runners, that lie close to the soil. Small yellow flowers grow on the lower part of the plant.

After a peanut flower receives pollen from another flower, it begins to wither. A stem called a peg then grows from the bottom of the flower. It anchors itself in the soil. The tip of each peg develops into a pod beneath the soil. This underground pod becomes the peanut—a shell with two to four seeds inside.

Many people eat roasted peanut seeds as a snack. People also crush peanuts to make cooking oil and peanut butter. In the early 1900s the U.S. scientist George Washington Carver developed many other uses for peanuts. Among them were new forms of cheese, coffee, flour, ink, plastic, wood stain, and soap. Farmers feed peanut plants to livestock.

Usually the tops of the plants are fed as hay after the pods are removed.

► More to explore

Carver, George Washington • Legume
• Nut • Pea

Pear

Pears are a popular fruit that can be dried, cooked, or eaten fresh. People use pears in salads, desserts, and jams. They also drink pear juice. Pears are a good source of potassium and fiber.

Pears grow in mild regions throughout the world. China, Italy, and the United States are the countries that grow the most pears. Among U.S. states, Washington, Oregon, and California usually grow the largest amount of pears.

Pear trees can grow as tall as 50 feet (15 meters) and can live for 75 years or more. They have broad, spreading



Anjou pears have green skin, often with a touch of red.

branches and rounded or oval leaves. The leaves appear on the tree about the same time that the flowers do. Pear flowers are about 1 inch (2.5 centimeters) wide with five rounded, white petals. Part of the flower later develops into the fruit.

The fruit may be yellow, green, red, or brownish in color. Some pears are narrow at the stem and rounder on the bottom. Others are round like an apple. Pears are generally sweeter and softer than apples, though some can be slightly tart. Well-known types grown in the United States include Bartlett, Bosc, and Anjou pears.

► More to explore

Fruit



Robert E. Peary, wearing fur clothing, stands next to his ship's steering wheel.

always depended on help from the local Eskimo (Inuit) people.

In 1892 Peary discovered the northern coast of the island of Greenland. This proved that Greenland did not extend all the way to the North Pole. In fact there is no land at the pole, only drifting ice. In Greenland Peary found meteorites, or rocks that had fallen from space.

North Pole

Peary tried several times to reach the North Pole before he succeeded. During one trip he lost several toes due to frostbite. In 1905–06 he used a powerful ice-breaking ship for the first part of his trip. This time Peary came closer to the Pole than anyone before him had come.

Peary tried again in 1908. He, Henson, and four Eskimo made the last stage of

Did You Know?

A doctor and explorer named Frederick A. Cook claimed that he reached the North Pole in 1908, a year before Peary. Few people now take Cook's claim seriously.

Peary, Robert E.

Robert E. Peary was the most famous U.S. explorer of the Arctic regions. He may have been the first person to reach the North Pole.

Robert Edwin Peary was born in Cresson, Pennsylvania, on May 6, 1856. He grew up in Maine. He studied engineering in college and then joined the U.S. Navy.

Early Exploring

Peary made his first expedition, or exploring trip, to the Arctic in 1886. Then he met Matthew Henson, who had traveled the world while working on a ship. Henson went with Peary on all his later expeditions. The explorers

the trip on dogsleds. They did not always stay together. Peary and Henson probably both reached the North Pole on April 6, 1909. Some people believe that Henson reached the Pole before Peary. As an African American, however, Henson faced racial prejudice. This may have kept him from receiving credit for the accomplishment.

Peary retired from the Navy in 1911. He died in Washington, D.C., on February 20, 1920.

► More to explore

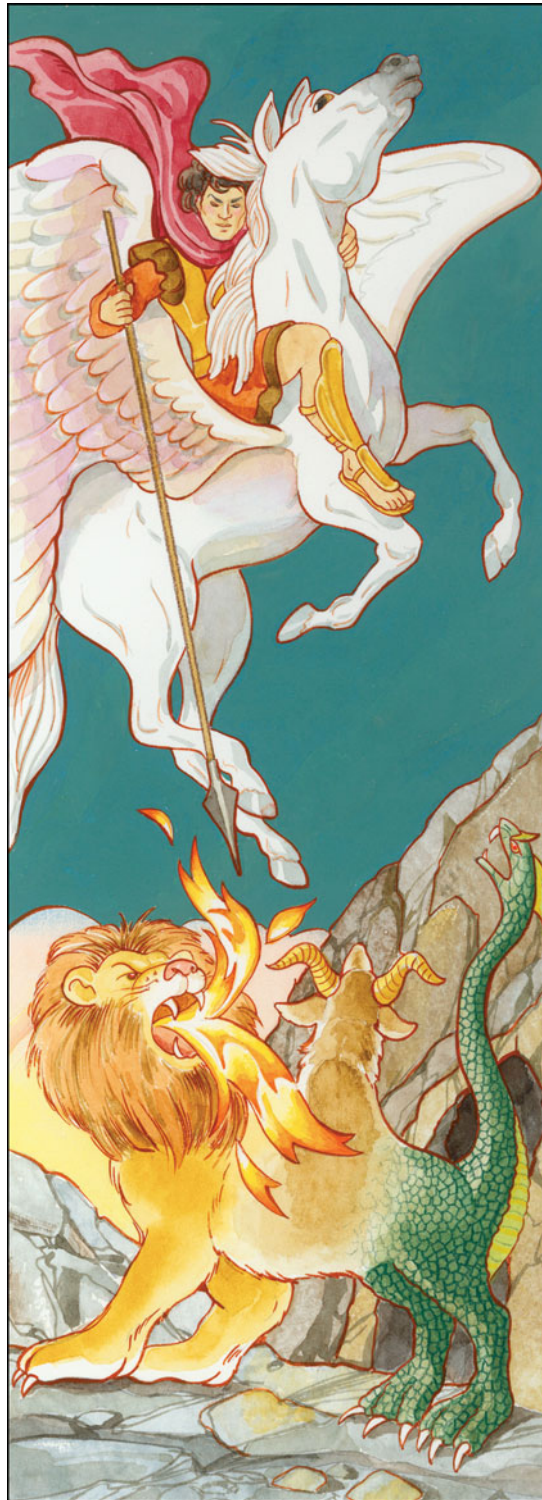
Greenland • Henson, Matthew • Polar Exploration

Pegasus

Pegasus was a winged horse in ancient Greek mythology. According to legend, he was created when the hero Perseus cut off the head of a frightful monster. Pegasus sprang from the monster's blood.

One famous story about Pegasus involves a young man named Bellerophon. Bellerophon wanted to ride Pegasus. Athena, the goddess of wisdom, helped him catch the flying horse. When he was riding Pegasus, Bellerophon was unbeatable. He was even able to kill the Chimera, a fire-breathing creature that was part lion, part goat, and part dragon.

Pegasus and Bellerophon had many adventures together. Bellerophon became a hero. But one time he tried to ride Pegasus up to Mount Olympus, the



In ancient Greek mythology, Pegasus was a horse with wings.

home of the gods. Pegasus knew it was wrong for Bellerophon to attempt such a thing. He threw Bellerophon to the ground.

According to the story, the gods rewarded Pegasus with a home on Mount Olympus. Pegasus became the favorite of Zeus, the chief god. The Greeks believed that whenever Zeus wanted to throw his thunderbolt, Pegasus brought him the thunder and lightning. Eventually, Pegasus was turned into a constellation, or a group of stars.

► **More to explore**

Greece, Ancient • Mythology • Perseus
• Zeus

Peking

► see Beijing.

Pelé

Pelé was a world-famous soccer player from Brazil. He was known for his



Pelé takes the ball down the field.

tremendous speed and balance, his jumping and ball-controlling abilities, and his spectacular goals. During his career Pelé played in 1,363 games and scored 1,281 goals.

Pelé was born on October 23, 1940, in the small village of Três Corações, Brazil. His real name is Edson Arantes do Nascimento. At some point he took the nickname Pelé, which has no particular meaning.

Pelé's father taught him how to play soccer. Pelé dropped out of school so he could spend more time on the game. By age 11, he began to receive professional coaching.

In 1956 Pelé began his professional career. He played for the Santos Football Club. Pelé led Santos to many championships and broke many records. He remained with the team until 1974.

Pelé led Brazil's national team to three World Cup championships. The first time was in 1958, when he was only 17 years old. He astonished the world by scoring six goals, including two in the championship game. With Pelé's help, Brazilian teams also won the World Cup in 1962 and 1970.

In 1975 Pelé joined the New York Cosmos. He led the team to a league championship in 1977 and then retired.

After retiring, Pelé composed music, wrote several books about his life, and appeared in a number of films. He also worked for children's causes. In the

1990s Pelé served as Brazil's minister of sports for four years.

► More to explore

Brazil • Soccer

Pelican

Pelicans are among the largest flying birds. They are famous for their huge throat pouches. A pelican uses its pouch and its very long bill to scoop up fish.

Pelicans live around lakes, rivers, and seacoasts in many parts of the world. They often fish and fly in small groups. They breed in very large groups on islands.

Scientists classify pelicans in the genus, or group, called *Pelecanus*. There are several different species, or types, of pelican. They are related to cormorants and gannets.

Most pelicans have mainly white feathers. The best-known types are the North American white pelican and the European white pelican. The brown pelican is darker. In all types the throat pouch does not have any feathers.

Some kinds of pelican can be more than 70 inches (180 centimeters) long. They may weigh more than 30 pounds (13 kilograms). Pelicans have long wing-spreads. Their wings can sometimes stretch more than 9 feet (2.7 meters) from tip to tip. This makes them good flyers. Their webbed feet help them swim. However, their short legs make them look clumsy on land.



A brown pelican perches on a net.

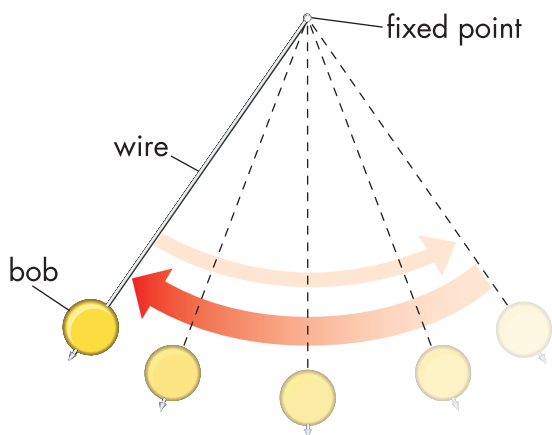
Pelicans eat several pounds of fish each day. Swimming pelicans often line up in a group and herd fish into shallow water. There they can easily scoop up the fish. A pelican holds fish in its throat pouch while squeezing water out of the corners of its mouth. Then it swallows its catch. The brown pelican fishes in a different way. It dives from high above the water.

► More to explore

Bird

Pendulum

In its simplest form, a pendulum is a weight that hangs from the end of a wire or a string. One end of the wire is attached to a fixed point. The weight, called the bob, hangs at the other end. If a person pulls the bob back and lets go, the pendulum swings freely. Once a pendulum is moving, it never twists or spins.



The bob of a pendulum swings back and forth in a path called an arc.

In the 1500s the Italian scientist Galileo discovered that the swing of a pendulum is constant. In other words, it always takes the bob the same amount of time to swing out from its starting point and come back again. The bob will eventually move a shorter distance back and forth. Nevertheless, the bob still takes the same amount of time to complete a swing. The length of the wire or string determines how long the swing takes.

This information soon became useful in clock making. In the 1600s scientists learned to use pendulums to make more accurate clocks. Even today many clocks have pendulums inside them. The pendulum swings back and forth at a regular rate. This keeps the other parts, including the hands on the face of the clock, moving at a regular rate as well.

In 1851 a French scientist named Jean Foucault used a giant pendulum to prove that Earth rotates. He hung a heavy bob on a thick wire attached to the inside of a dome. As the bob moved,

it traced a line in the air. As the day passed, the line seemed to be changing direction. Because the pendulum was not spinning, Earth had to be rotating underneath it.

► More to explore

Clock • Galileo

Penguin

Penguins are the only birds that can swim but cannot fly. These black and white seabirds move about very easily in the water. On land they stand upright and waddle about.

Where Penguins Live

There are 18 species, or types, of penguin. They are found mainly in the southern half of the world. Many types are found in the cold regions of Antarctica or nearby islands. Penguins also live along the cool coasts of Africa, New Zealand, Australia, and South America. The Galápagos penguin lives in a warm region off the coast of Ecuador.



Emperor penguins gather on the ice in Antarctica.

Physical Features

A penguin typically has a black back and a white belly. Different types range in height from about 14 to 45 inches (36 to 114 centimeters). The largest type is the emperor penguin, which weighs about 80 pounds (36 kilograms).

Penguins are excellent swimmers and divers. They can swim faster than 25 miles (40 kilometers) per hour. Penguins use their short, paddlelike wings as flippers for swimming. Their feet are webbed, and their bodies are shaped like torpedoes. Penguins have short legs, but they can run fairly quickly. To travel over ice and snow, a penguin may slide on its belly.

A penguin is covered nearly all over with short feathers. The feathers keep water out and trap warm air against the skin. A thick layer of fat also protects this bird from the cold.

Behavior

Penguins may stay at sea for weeks at a time. They dive after small sea animals to eat. Different types eat small fishes, squid, and shrimplike animals called krill.

Penguins breed in large groups called nesting colonies. Some types travel long distances to reach their nesting colonies. They may return to the same nesting place year after year.

► More to explore

Bird

Penicillin



Penicillium mold is the source of penicillin.

The discovery of penicillin was one of the greatest scientific achievements of the 1900s. Penicillin belongs to a group of medical drugs called antibiotics. These medicines fight infections caused by small living things called bacteria.

Infectious diseases once caused many deaths. The discovery of penicillin therefore saved millions of lives.

In 1928 an English doctor named Alexander Fleming discovered the effects of penicillin. While doing research on bacteria, Fleming noticed that the bacteria would not grow near a certain mold. He found that the mold was a type called *Penicillium notatum*. This mold is similar to the green fuzzy mold that grows on bread. From the mold Fleming developed the antibiotic now known as penicillin.

By the late 1930s penicillin was being used to treat infections in hospitals.

During World War II in the 1940s, military doctors used penicillin to treat infected wounds. Penicillin is now widely used in the treatment of throat infections, meningitis, and other infections.

► **More to explore**

Antibiotic • Bacteria

Penn, William

William Penn founded the colony of Pennsylvania in 1681. He wanted to create a place where many religious faiths would be allowed.

Early Life

William Penn was born in London, England, on October 14, 1644. His father was a wealthy admiral in the English Navy. As a young man, Penn left the Church of England and joined the Quakers.



William Penn

The Quakers (also known as the Society of Friends) were a Christian group that had no ministers. Instead, they held meetings at which anyone could speak. Other Christians saw the Quakers as disrespectful or even dangerous. Penn went to jail four times for his beliefs.

Founder of Pennsylvania

Like others before them, the Quakers decided to look for religious freedom in North America. In 1681 King Charles II gave Penn the right to build a colony there. The colony's name, Pennsylvania, combined Penn's family name with a Latin word for woodland.

Penn wanted Pennsylvania to be a "holy experiment" in tolerance. This meant that the colony welcomed all Christians, not just Quakers. In addition, Penn prepared a constitution, or document of government, for the colony. The constitution provided for an assembly of elected representatives.

Penn arrived in his colony in 1682. Using his instructions, the colonists had already laid out the new city of Philadelphia. Penn signed treaties of friendship with the region's Native Americans, the Delaware (Lenni Lenape) people. In 1684 Penn had to return to England. He went back to the colony in 1699 but left again in 1701. Money problems and bad health kept Penn from ever returning to Pennsylvania. He died in Buckinghamshire, England, on July 30, 1718.

► **More to explore**

Pennsylvania • Quaker

Pennsylvania

The U.S. state of Pennsylvania was named after William Penn. The state's name actually means "Penn's Woods." William Penn founded the original colony in the early 1680s. Pennsylvania's nickname, the Keystone State, refers to its central location among the 13 original states. The capital is Harrisburg.

Pennsylvania played an important role in the history of the United States. From 1790 to 1800 the city of Philadelphia served as the country's capital. And during the American Civil War, one of the most important battles was fought at the Pennsylvania town of Gettysburg.

Geography

Pennsylvania is in the Middle Atlantic region of the United States. Pennsylvania's eastern boundary is the Delaware River. The river separates Pennsylvania from New Jersey and New York. In the north, Pennsylvania borders New York and Lake Erie. Southeast of Pennsylvania is the state of Delaware. West Virginia borders Pennsylvania on both the south and west. Maryland is also south of Pennsylvania, and Ohio is to the west.

Most of Pennsylvania lies within the Appalachian Mountains. High, rugged land called a plateau covers all of the north and west except for a lowland plain along Lake Erie. The Allegheny Mountains, a section of the Appalachians, run across the state from southwest to northeast. In the southeast are a hilly farming region and a plain.

People

More than four fifths of Pennsylvania's population is white. Many whites are of German, Irish, or Italian heritage. African Americans are the largest minority group in Pennsylvania. They make up about one tenth of the state's population. About 3 percent of the people are Hispanic, and about 2 percent are Asian.

The Amish are a unique religious group who live in Pennsylvania. They speak a type of German as well as the English language. The Amish way of life is the same as it was centuries ago. They live in small communities of hand-built buildings and do not use electricity. Instead of automobiles they travel in horse-drawn wagons.

Economy

Pennsylvania has one of the strongest economies of all the states. The major manufactured products are chemicals,



Facts About PENNSYLVANIA

Flag



Population

(2000 census)
12,281,054—
rank, 6th state;
(2008 estimate)
12,448,279—
rank, 6th state

Capital

Harrisburg

Area

46,055 sq mi
(119,283 sq
km)—rank, 33rd
state

Statehood

December 12,
1787

Motto

Virtue, Liberty,
and
Independence

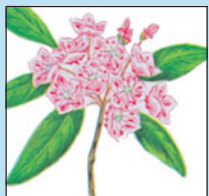
State bird

Ruffed grouse



State flower

Mountain laurel



metal goods, and processed foods. Two companies in the state make well-known food products. The Hershey company is famous for its chocolate and H.J. Heinz is famous for its ketchup.

Although much of the land is mountainous, Pennsylvania has many valleys suitable for farming. Dairy and beef cattle and chickens account for much of the state's farm income. Pennsylvania is a major producer of milk, cheese, eggs, mushrooms, and fruit. Forestry is also important.

Tourism adds billions of dollars to Pennsylvania's economy each year. The tourism industry creates jobs in hotels, restaurants, and the travel business. Each year millions of tourists visit the state's famous historical sites. Many people go to Philadelphia to see Independence Hall and the Liberty Bell. Tourists also visit the historical parks at Valley Forge and Gettysburg.

History

Before the 1600s only Native Americans lived in the region now known as Pennsylvania. The region's four major Native American groups were the Delaware, the Susquehannock, the Shawnee, and the Iroquois. Swedes from northern Europe founded the area's first colony in 1638. The Dutch took over the territory in 1655, and nine years later the English seized the land.

In 1681 King Charles II of England granted the Pennsylvania region to William Penn. Penn wanted to start a new



An Amish family works on a farm in Pennsylvania. The Amish first came to Pennsylvania in the 1700s.

colony in America. He was a member of the religious faith known as the Society of Friends, or Quakers. In England, the Quakers had been punished for their religious beliefs. Penn established the new colony in order to create a safe place for the Quakers. In Pennsylvania the religious practices of the Quakers and other religions were respected. The religious freedom of Pennsylvania attracted many people to the colony. Philadelphia, the colonial capital, became the largest city in the American Colonies.

Pennsylvania was a key state during the period of the American Revolution (1775–83). The Declaration of Independence was signed in Philadelphia. Valley Forge was the site of the Continental Army's winter camp in 1777–78. After the Revolution was won, the U.S. Constitution was written in Philadelphia in 1787. Pennsylvania became the second state to approve the document, on December 12, 1787.

Pennsylvania remained with the Union during the American Civil War (1861–65). In 1863 one of the key battles of the war took place at Gettysburg, in the southern part of the state. Not long after the bloody fight had ended, a part of the battlefield was dedicated as a national cemetery. During the dedication ceremony, President Abraham Lincoln delivered his famous Gettysburg Address.

Many parts of Pennsylvania became industrial centers in the 1800s. Coal mining and steelmaking were very important industries. The steel industry was centered in Pittsburgh. During World War I (1914–18) and World War II (1939–45), Pennsylvania's industries were major suppliers of iron and steel, arms, and machinery. In the decades after World War II, however, the state's coal and steel industries became much less important.

In 1979 the first major nuclear accident in the United States took place at the Three Mile Island nuclear power plant near Harrisburg. Cleanup of the radioactive waste cost more than a billion dollars.



An old cannon stands in the Gettysburg National Military Park in southern Pennsylvania. The park has many monuments to the soldiers who fought there. It also features exhibits that explain what happened during the battle.

On September 11, 2001, an airplane flying over western Pennsylvania was taken over by a group of hijackers. The passengers stopped the hijackers from continuing to the East Coast and crashing the airplane into a building. Instead the airplane crashed in a field southeast of Pittsburgh. The plane was one of several taken over by terrorists on that day.

► More to explore

American Civil War • Appalachian Mountains • Harrisburg



The Allegheny River and the Monongahela River join to form the Ohio River in Pittsburgh, Pennsylvania.

Peony



Garden peony flowers range in color from white to pink to deep red.

Peonies are flowering plants with large blossoms. There are two basic types: garden peonies and tree peonies. Most garden peonies are native to Europe and Asia. All tree peonies originated in China.

Peonies grow best in sunny areas. Flowers bloom in late spring or early summer and last about one week. Then the plants produce seed pods. Some garden peonies can live for more than 30 years.

Garden peonies grow to about 3 feet (1 meter) in height. Most types produce only one flower on a stem. Flowers may grow up to 6 inches (15 centimeters) across. They are commonly white, pink, magenta, or deep red. Each flower has 5 to 10 petals. The flowers often have ants crawling on them. The ants are attracted to the nectar the buds produce.

Tree peonies are shrubby plants. Their woody stems can grow to about 7 feet (2 meters) tall. Flowers may be white, yellow, lilac, violet, or red. Dozens of flowers can grow on one shrub. Blossoms measure about 6 to 8 inches (15 to 20 centimeters) across.

Peonies are valued as garden flowers. People also use peonies in floral arrangements.

Pepper

Peppers are the fruits of many different garden plants. They are eaten as vegetables and used to flavor foods. Garden peppers come from plants of the nightshade family, which also includes tomatoes, potatoes, and eggplant. The spice called black pepper comes from an unrelated plant.

Peppers are grown widely in the tropical parts of Asia and Central and South America. The first Europeans to visit the



Garden peppers come in many colors and flavors.

Americas carried pepper seeds back to Spain in 1493. From there the plants spread quickly throughout Europe.

Pepper plants reach 2 to 4 feet (0.6 to 1.2 meters) in height. The fruits differ in size, shape, and taste. When ripe, peppers range in color from yellow to deep red and purple.

Peppers can be mild or hot. Mild peppers are usually large. Bell, or sweet, peppers are mild peppers that are bell-shaped, wrinkled, and puffy. They are often used in salads and in cooked dishes. Bell peppers are rich in vitamins A and C. Paprika is a mild pepper that is usually made into a powder and used as a spice.

Hot peppers include tabasco, chili, and cayenne peppers. These peppers contain a substance called capsaicin, which gives them a strong, burning taste. Hot peppers are generally used as relishes or are ground into a fine powder for use as spices. Tabasco peppers are ground and mixed with vinegar to make a popular hot sauce.

► More to explore

Potato • Spice • Tomato

Pequot

The Pequot are a Native American people of eastern Connecticut. In the 1600s the tribe was nearly wiped out by disease and war with English settlers.

The Pequot lived in wigwams, which were dome-shaped houses made from



A decorated Pequot canoe is displayed in a Connecticut museum.

wooden poles and bark. They grew corn and other crops. They also fished and hunted for deer and other animals.

Dutch and English settlers arrived in Pequot territory in the early 1600s. At first the Pequot got along with the settlers. Soon, though, many Pequot died from diseases brought by the settlers. And within a few years the Pequot and the English began fighting over land. In 1637 the English and other Native American groups attacked the main Pequot village in Connecticut. About 600 Pequot were killed.

After the war some Pequot tried to flee. Many were captured or killed by the English or other Indian tribes. The English sold some Pequot as slaves. They sent other Pequot to live with other tribes. Many of the Pequot were put under the control of the Mohegan. The Mohegan treated the Pequot so badly that the English had to separate the two groups in 1655. The English moved the Pequot to land along the Mystic River in Connecticut. At the end of the 20th

century there were about 1,300 Pequot in Connecticut.

► More to explore

Mohegan • Native Americans

Perseus

Perseus was a hero in ancient Greek mythology. He was the son of Zeus, the chief god. His mother was Princess Danaë.

According to legend, a king fell in love with Danaë. But he wanted to get rid of Perseus. So he tricked Perseus. He made Perseus promise to get the head of the evil monster named Medusa. Medusa was a Gorgon, a winged creature with snakes for hair. Anyone who dared to look at her turned to stone. The cruel king believed he would never see Perseus again.

In his quest to kill Medusa, Perseus received help from the gods. Hermes, the messenger god, guided him on his journey and gave him a magic sword. Athena, the goddess of wisdom, gave Perseus a bronze shield. Minor goddesses called nymphs gave him a helmet that made him invisible.

Perseus attacked Medusa while wearing the magic helmet. He also was careful not to look right at her. Instead, he looked only at her reflection in the polished shield. With one stroke of his sword he cut off Medusa's head. He then put the head in a bag. Perseus returned home and went to the king's palace. There he pulled out Medusa's



In ancient Greek mythology, Perseus was a son of the god Zeus. Perseus was known for killing Medusa, a monster with snakes for hair.

head. The king looked directly at it and instantly turned to stone. Later Perseus

Did You Know?

After his death, Perseus was taken up to the sky by Zeus and made into a constellation (a group of stars).

gave the head to Athena, who placed it on her shield.

► More to explore

Athena • Hermes • Mythology • Zeus

Persia

Persia was a mighty kingdom centered in what is now Iran. The Persians rose to power in about 550 BC. For about 200 years they ruled a vast empire. It stretched from the Indus River in southern Asia to parts of southern Europe and northern Africa.

After the fall of the empire, a number of peoples ruled Persia. The present-day country of Iran had its beginnings in the early 1500s. But the outside world called it Persia until 1935.

The Persian Empire

In about 550 BC Cyrus II became king of Persia. Over the next 40 years the Persians brought one region after another under their control. Persian kings treated the groups they conquered with fairness and respect. They allowed conquered peoples to follow their local customs.

In 522 BC Darius I became king. During his rule the Persian Empire grew to its greatest size and power. The empire was divided into 20 provinces. A governor ruled each of the provinces. The governors enjoyed a great deal of freedom in ruling. However, military forces in each province kept the governors from becoming too strong. Persian kings also



Persian kings built a hall called the Apadana in the city of Persepolis about 2,500 years ago. A stairway still stands. Carvings on it show a lion attacking a bull.

used spies to keep track of the governors' activities.

The Persians built a series of roads to increase communication and business activity throughout the empire. The most famous road was the Royal Road. The Royal Road stretched more than 1,500 miles (2,400 kilometers) west from the Persian capital of Susa.

Later Persia

In about 500 BC the Persian Empire slowly began to weaken. It suffered military defeats and rebellion. In the 300s BC a kingdom known as Macedonia had come to power in Greece. By 330 BC the Macedonian ruler Alexander the Great had conquered the Persians.

Persians known as the Parthians and the Sasanians ruled Persia from about 247 BC until the AD 600s. At that time Muslim Arabs invaded. The Persians became

Muslims but kept their own language, which is called Farsi or Persian. A ruling family from Persia called the Safavids regained control in the early 1500s. They called their country Iran.

► More to explore

Greece, Ancient • Iran • Persian Wars

Persian Gulf War

In 1990 an army from Iraq took over the country of Kuwait. In January 1991 the United Nations (UN) sent in armies from many countries to push out the Iraqis. The war they fought is called the Persian Gulf War. (Kuwait and Iraq lie on the Persian Gulf, a body of water in the Middle East.)

Background

Iraq needed money after fighting the Iran-Iraq War, which ended in 1988. Iraq's neighbor Kuwait was rich because it produced oil. To get control of Kuwait's oil, President Saddam Hussein of Iraq sent in troops on August 2, 1990. Kuwait fell quickly to the Iraqis.



General H. Norman Schwarzkopf gets U.S. troops ready to fight in the Persian Gulf War.

Almost every other country disapproved of what Iraq had done. On November 29 the UN threatened Iraq with military force unless it got out of Kuwait by January 15, 1991.

The United States and other countries thought that Iraq might also try to get the oil supply in Saudi Arabia. (Saudi Arabia is next to Kuwait and Iraq.) To shield Saudi Arabia, they sent forces there. This military buildup was called Operation Desert Shield.

By January 1991 there were about 700,000 troops in the Persian Gulf region ready to fight Iraq. These allied troops came from the United States, the United Kingdom, France, Canada, Australia, Egypt, Saudi Arabia, Syria, and several other countries. Meanwhile, Saddam Hussein ignored the UN's deadline. He built up his army in Kuwait to about 300,000 troops.

War

During the night of January 16–17, the Persian Gulf War began with a massive attack on Iraq by allied warplanes. This campaign was named Operation Desert Storm. A ground attack, called Operation Desert Saber, followed on February 23–24. Within just four days, Iraq's troops stopped fighting. Arab and U.S. forces easily recaptured Kuwait's capital. The war ended on February 27, 1991. About 300 allied soldiers and thousands of Iraqis died in the war.

Results

The UN had banned most trade with Iraq before the war. The ban remained

in force after the fighting ended. At the same time, the UN told Iraq that it must destroy many of its weapons. The UN sent inspectors to Iraq to make sure that the Iraqis destroyed the weapons. In about 1998, however, Iraq stopped cooperating with the inspectors. This and other disputes led to another war. Troops from the United States and other countries invaded Iraq in March 2003.

► More to explore

Iran-Iraq War • Iraq • Kuwait • United Nations

Persian Wars

By 500 BC Persia ruled a large empire that was centered in what is now Iran. The Persians had conquered a number of ancient Greek cities, called city-states, that lay along the eastern Mediterranean Sea. The city-states were independent of each other. But in about 499 BC they united in rebellion against their Persian rulers. This rebellion started the Persian Wars, a long series of battles between the Greeks and the Persians.

During the rebellion Athens sent 20 ships to help the Greek rebels. Athens was a powerful city-state on the Greek mainland. Despite the help from the Athenians, the rebels lost to the Persians.

The Persians vowed revenge against Athens for its part in the rebellion. In 490 BC a Persian army invaded mainland Greece. The Athenians faced the Persians in battle on the plain of Marathon,



An illustration shows a united force of Greeks (right) defeating the Persians in battle in 479 BC.

about 25 miles (40 kilometers) from Athens. Although there were fewer Athenians than Persians, the Athenian troops badly defeated the Persians.

Ten years later the Persians returned. This time both their army and navy were huge and powerful. One battle followed another. Finally, in 480 BC the Greeks defeated the Persians in a great sea battle in the Strait of Salamis. (The Strait of Salamis is a narrow body of water a few miles west of Athens.) Another Greek victory came the following year.

Smaller battles raged for the next 30 years, but the Persians never again conquered the Greeks. In 449 BC the Greeks and the Persians agreed to a final peace treaty. The Greek victory allowed Greek culture and political ideas to last long after the end of the Persian Empire.

► More to explore

Athens • Greece, Ancient • Iran • Marathon



Peru

The country of Peru sits on the west coast of South America. For hundreds of years the great Inca Empire ruled the land that is now Peru. The capital of Peru is Lima.

Geography

Peru shares borders with Ecuador, Colombia, Brazil, Bolivia, and Chile. The Pacific Ocean lies to the west.

The Andes Mountains run north and south through the center of the country. In southern Peru many of the mountains are volcanoes. Also in the south is Lake Titicaca, one of the world's highest lakes.

Low desert lands lie west of the Andes. East of the Andes is a large, humid region called the montaña. In the northeast several rivers flow out of the Andes to join the Amazon River. The area near the river is hot and rainy year-round.



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Plants and Animals



A blue-and-yellow macaw shares a perch with five scarlet macaws in Peru. Macaws are birds that are closely related to parrots.

The dry coastal region and the mountains have few plants besides shrubs, cacti, and grasses. Llamas, alpacas, vicuñas, and guanacos—all relatives of the camel—live in the Andes.

Thick, tropical rain forests grow in the montaña. Parrots, monkeys, jaguars, and crocodiles live in the forests. The world's largest rodent, the capybara, also lives there.

People

About half of the population is American Indian. Mestizos, or people with both Indian and European roots, make up about a third of the population. Whites, mainly with Spanish roots, make up a small part of the population. They control most of Peru's power and money. There are also small groups of Japanese, Chinese, and others.

Most Peruvians live in cities and towns along the coast. However, many Indians live in the Andes or in the Amazon region. The Indians speak Quechua or Aymara. Other Peruvians speak Spanish. Roman Catholicism is the country's main religion.

Economy

Peru's natural resources are important to its economy. Peru has deposits of gold, copper, zinc, silver, lead, and iron ore. It also mines some petroleum (oil). Farmers in Peru grow sugarcane, rice, corn, cotton, and potatoes. They also raise sheep, cattle, pigs, goats, and chickens.

Many industries in Peru use the country's resources or farm products. For example, Peruvians make cloth from the wool of llamas, alpacas, and sheep. Factories also make food products, metals, clothing, and wood products.

History

More than 3,000 years ago several cultures developed in parts of what is now Peru. In the 1400s the Inca built a large empire along the west coast of South America.



Some valleys of the Andes have good farmland.

In 1533 the Spanish explorer Francisco Pizarro conquered the Inca Empire. Millions of Inca died. The Spanish grew rich from the land's gold and silver.

In 1821 a general from Argentina captured Lima and declared Peru independent from Spain. From 1879 to 1883 Peru fought a war with Chile.

Military leaders ruled Peru off and on until 1980. Alberto Fujimori became president in 1990. However, Peruvians accused him of illegal activities. He left the country in 2000.

► More to explore

Andes • Inca • Lima



A town plaza, or square, in the center of Arequipa, Peru, features a Roman Catholic cathedral (left) and church (right). Arequipa is one of Peru's largest cities.

Facts About PERU



Population
(2008 estimate)
28,534,000

Area
496,225 sq mi
(1,285,216 sq km)

Capital
Lima

Form of government
Republic

Major cities
Lima, Arequipa,
Trujillo, Chiclayo,
Iquitos

Pet

Pets are animals that people keep mainly for enjoyment and companionship. Some pets also help or protect their owners. Pets need a lot of attention and care. However, they also add a lot of fun and happiness to their owners' lives.

Popular Pets

Cats and dogs have long been the most common pets. People tamed wild dogs thousands of years ago. Ancient Egyptians worshipped cats and even buried them with people. Today birds, fish, guinea pigs, hamsters, and snakes are also popular pets.

Working Pets

Some pets are more than just companions for people. Cats often help people by catching mice. Many dogs protect the home of their owner. Sled dogs carry people and goods across the snowy wilderness. Farm dogs may herd sheep or cows. Guide dogs go everywhere with their blind owners. People with other disabilities sometimes have animals to help them, too.



Many children keep dogs as pets.

Pet Care

Pets need almost as much care as children. They need food, water, and shelter. They need to be kept clean, and they need exercise. They should also be taken to an animal doctor, or veterinarian, on a regular basis. The veterinarian can help keep pets healthy by giving them shots to protect against certain diseases.

Wild Animals as Pets

Most of the animals that people keep as pets are tame. But sometimes people keep wild animals as pets. But these animals usually do better in their natural habitat. Some rare animals cannot survive at all if taken from the wild. Even if they do survive, wild animals rarely become completely tame. They need to be watched carefully.

When people try to obtain wild pets, animals suffer in many ways. People called poachers illegally hunt and trap them. Many baby animals die when they are taken from their mothers and shipped off to be sold as pets. Poachers hunt some kinds of animals until almost none of the animals are left.

► More to explore

Animal • Cat • Dog

Peter the Great

The Russian tsar, or emperor, Peter I is called Peter the Great because of his outstanding career as a ruler and reformer. He made Russia more modern and more powerful.



Peter the Great

Early Life

Peter was born on June 9, 1672, near Moscow, Russia. He was about 4 years old when his father died. Peter's half-brother Fyodor became tsar, but he died in 1682. Peter and another half-brother, Ivan, were then made tsars together. Ivan's sister Sophia ran the country while Peter grew up in a village outside Moscow.

Peter seized power from Sophia in 1689. In 1696 Ivan died, leaving Peter as Russia's only tsar.

Russian Expansion

At the beginning of Peter's reign, Russia covered a huge territory. However, it did not have good access to the sea. Peter wanted to change this. In 1700 Peter led Russia into war against Sweden, which controlled the Baltic Sea. During the war Peter built a new capital city, Saint

Petersburg, on land captured from Sweden. Russia won the war in 1721.

After the victory over Sweden, the Russian Empire was formed. Peter expanded the empire in a war against Persia in 1722–23. Russia won land around the Caspian Sea.

Reforms at Home

Peter also made many changes within Russia. He looked to western Europe for ideas. The countries there had already made some of the kinds of changes he wanted to make in Russia. In 1697 Peter traveled to Europe. He disguised himself and worked in shipyards in England and the Netherlands. He learned as much as he could about the West.

Peter brought Western ideas back to Russia. He made the government and the army more modern. He encouraged industry and trade. He built schools and hospitals. He even tried to make Russians look more Western by taxing people who wore beards and Asian clothing. Not everyone liked the changes. Peter died in Saint Petersburg on February 8, 1725.

► More to explore

Russia • Saint Petersburg • Tsar

Petroleum

Petroleum is another name for oil, a liquid found deep underground. Petroleum is a valuable natural resource. It is used to make many products that people use every day. These products include gasoline, paints, and even lip balm.

Did You Know?

The war between Russia and Sweden for control of the Baltic Sea is called the Great Northern War.

How Petroleum Formed

Petroleum formed from the remains of tiny plants and animals that lived hundreds of millions of years ago. When these living things died, they sank into mud. As layers of mud and rock piled up, they pushed down on the lower layers. Eventually this pressure and Earth's heat changed the plant and animal remains into petroleum.

Drilling and Refining

Underground, petroleum collects in reservoir rock. This is rock that has thousands of tiny holes in it. Sometimes reservoir rock has large, bowl-shaped spaces in it. These spaces trap huge amounts of petroleum near Earth's surface. Workers drill down to collect the petroleum from reservoir rock traps.

After workers pump the crude, or raw, petroleum from the ground, it goes to large factories called refineries. There the crude petroleum is refined, or cleaned, to make it ready to use.



A ship called a tanker unloads petroleum at a port in California.

Uses

People use refined petroleum to make many different products. Some parts of the petroleum go into fuels such as gasoline, diesel fuel, and jet fuel. Other parts are used to make waxes and greases such as petroleum jelly. Plastics, fertilizers, explosives, and certain drugs also come from refined petroleum.

Disadvantages of Petroleum

Burning fuel made from petroleum releases harmful gases into the air. These gases can mix with moisture to create acid rain, a dangerous form of pollution. Burning petroleum also helps to trap heat in Earth's atmosphere. This process is called global warming. It may harm plants and animals and cause ocean levels to rise.

In addition, the world has a limited supply of petroleum. It is called a nonrenewable resource because it cannot be replaced once it is removed from the ground. People are using up petroleum so fast that eventually the supply may be gone.

► More to explore

Fossil Fuel • Global Warming
• Pollution

Pharaoh

The rulers of ancient Egypt were called pharaohs. The word pharaoh means "great house." It originally described the royal palace but later described the rulers themselves.



A huge statue of the pharaoh Ramses II stands at the temple of Luxor in Egypt.

Role

Pharaohs were absolute, or all-powerful, rulers. They made laws, controlled the land and its resources, and maintained an army. Assistants called viziers and other officials helped pharaohs to govern. Pharaohs were also religious leaders. In fact, Egyptians worshipped their pharaohs as gods.

Burial

When pharaohs died, their bodies were preserved as mummies. Egyptians then buried the mummies in tombs, sometimes in or under pyramids. They buried treasures along with the mummies. Egyptians believed that pharaohs lived on as gods in the afterlife.

Famous Pharaohs

One of the best-known pharaohs is Tutankhamen. He ruled in the 1300s BC, from about age 8 until he died 10 years

later. Archaeologists found his tomb in 1922. In addition to his mummy, there was a gold mask of the pharaoh's face, jewelry, furniture, weapons, and other treasures buried in the tomb.

In the 1200s BC Ramses II ruled as pharaoh for about 67 years. He fought many successful wars. He also ordered many temples and statues to be built. Giant statues of Ramses II survive in Egypt today.

Ancient Egypt also had some female pharaohs. Many of them ruled with their husbands or for their young sons. Hatshepsut, however, ruled on her own as a pharaoh in the 1400s BC. Cleopatra is probably the most famous woman ruler of Egypt. Part of a line of pharaohs from Macedonia, she ruled from 51 to 30 BC. After her death the Roman Empire took over Egypt, and the rule of the pharaohs ended.

► More to explore

Cleopatra • Egypt, Ancient • Hatshepsut
• Pyramid • Tutankhamen

Did You Know?

Tutankhamen's mummy was found lying within a nest of three coffins. The innermost coffin was made of solid gold.

Philadelphia



Population

(2000 census),
city, 1,517,550;
(2007 estimate)
1,449,634

Philadelphia is the largest city in the state of Pennsylvania. It is also one of the largest cities in the United States. Philadelphia played a central role in the



Independence Hall is part of Independence National Historical Park in downtown Philadelphia, Pennsylvania.

country's early history. It was the capital of the United States from 1790 to 1800. The city lies where the Delaware and Schuylkill rivers meet.

Places of Interest

Two important U.S. historical documents—the Declaration of Independence and the U.S. Constitution—were created in Philadelphia's Independence Hall. The city is home to the Liberty Bell, a famous symbol of U.S. freedom. Philadelphia also has museums about the inventor, publisher, and political leader named Benjamin Franklin. He lived in the city for most of his life.

Economy

Philadelphia's economy is based mainly on services, including health care, education, trade, and communications. The city is a center of banking, scientific research, and business. Factories in Philadelphia make medicines, processed

foods, machinery, electronics, and metal products.

History

The Philadelphia area was once home to Delaware Indians. The area became part of the colony of Pennsylvania in 1681. William Penn, a leader of the Quaker religion, established the colony as a place of religious freedom. Penn founded Philadelphia in 1682. Its name is Greek for “the city of brotherly love.” Philadelphia soon grew into a major center of trade and industry.

Philadelphia played a special role in the American Revolution, which led to the creation of the United States. The Declaration of Independence was signed in Philadelphia on July 4, 1776. Eleven years later the U.S. Constitution was written in the city.

For many years Philadelphia was the center of U.S. politics, culture, and banking. However, in the 1800s it lost those roles to Washington, D.C., and New York City. Today Philadelphia remains a center of business, higher education, and the arts.

► More to explore

Declaration of Independence • Franklin, Benjamin • Liberty Bell • Penn, William • Pennsylvania • United States Constitution

Philip, King

► see Metacom.

Philippines

The Republic of the Philippines is a country of Southeast Asia. It is made up of about 7,100 islands in the western Pacific Ocean. The capital is Manila.

Geography

The South China Sea lies to the west and north of the Philippines. The Philippine Sea is to the east. The country's nearest neighbors are Taiwan, Indonesia, and Malaysia.

Eleven large islands have more than nine tenths of the land. The two largest islands are Luzon in the north and Mindanao in the south. Most of the Philippine islands are mountainous. Mount Apo, on Mindanao, is the country's highest peak. Some of the mountains are active volcanoes.

The country has a hot and humid climate, with rainy and dry seasons. Earthquakes and typhoons (storms similar to hurricanes) are common.

Plants and Animals

The forests of the Philippines contain lauan (Philippine mahogany) and other trees. Mangrove swamps, grasses, flowering plants, and ferns also grow on the islands. Wildlife includes monkeys, deer, water buffalo, civet cats, bats, wild pigs, and poisonous cobras.

People

The people of the Philippines are called Filipinos. Nearly all Filipinos are Malay.

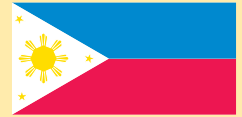
Their ancestors came from the Malay Peninsula in Southeast Asia. Some of the Malay also have Spanish or U.S. ancestors. There are small groups of Chinese and mixed Malay-Chinese. The original people of the islands, the Negritos, form a very small part of the population.

The population is also divided into groups based on language. The largest groups speak Tagalog, Cebuano, Ilocano, and Ilongo. Many Filipinos speak English and Filipino (a form of Tagalog) as second languages.

Most Filipinos are Roman Catholics. More than half of the people live in cities, mainly on Luzon Island.

Economy

Services and manufacturing are important parts of the economy. Services include transportation, health care, and





An active volcano called Mount Mayon rises above a field on the island of Luzon in the Philippines.

Facts About PHILIPPINES



Population
(2008 estimate)
90,227,000

Area
122,121 sq mi
(316,294 sq km)

Capital
Manila

Form of government
Republic

Major cities
Quezon City,
Manila, Caloo-
can, Davao,
Cebu

education. The country's industries make food products, electronics, clothing, chemicals, and wood products.

Farming is also important. Filipinos raise rice, corn, pigs, chickens, and goats for food. Crops sold to other countries include coconuts, sugarcane, bananas, and pineapples. Fishing is another source of food and money.

History

The ancestors of the Negrito people lived on the islands about 50,000 years ago. The Malay began arriving about 2,000 years ago from what are now Indonesia and Malaysia.

Spain took over the islands in the 1500s. In the late 1800s Filipinos began fighting for independence from Spain. Meanwhile, Spain fought the United States in

the Spanish-American War of 1898. After Spain lost the war, the United States took control of the Philippines.

The Filipinos fought against the United States but failed. The United States shaped the government, economy, and culture of the islands until the 1940s. The Japanese took over the islands during World War II. The Philippines gained full independence after the war, in 1946.

Ferdinand Marcos became president in 1965. Marcos used the military to help him rule the country. Corazon Aquino defeated Marcos in the presidential election of 1986. She returned democracy to the Philippines. However, the country continued to face problems in the economy and in the government. Plus, the Philippines faced two rebellions. Communist rebels wanted to overthrow the government. Muslim rebels wanted more power to govern themselves.

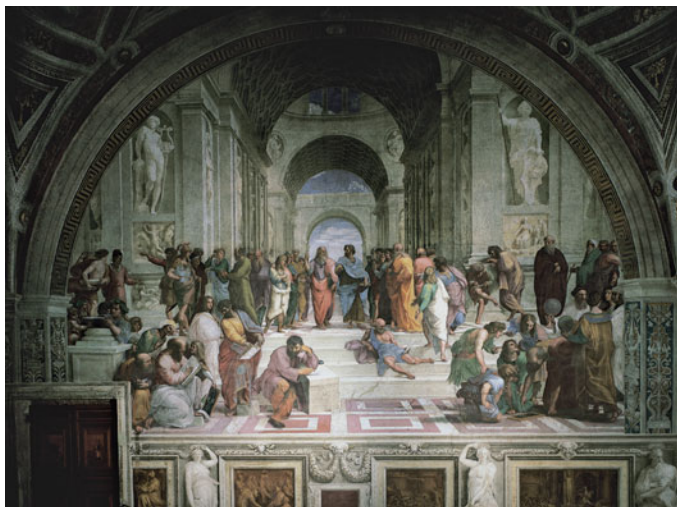
► More to explore

Manila • Spanish-American War



Workers plant rice in a flooded field. Rice is one of the most important crops produced in the Philippines.

Philosophy



Raphael, an Italian painter of the 1500s, imagined a meeting of philosophers from all periods of history.

The word philosophy comes from the Greek language. It means “love of wisdom.” Philosophy is the study of some of the most basic questions about human life. For example, what can people really know about life? Or, are human beings basically good or evil?

There are many branches, or areas, of philosophy. Some branches deal with questions about reality and how people understand and experience it. Other branches deal with questions about how people behave and what is good or bad behavior.

Philosophers are people who study philosophy. They usually choose a particular branch of philosophy to study. The work of philosophers includes observing the world, doing experiments, and thinking. Philosophers may write books and articles on the issues that they study. They also may look at the ways other

philosophers have answered questions. Then they may agree or disagree with what these other philosophers have said.

Some of the most famous philosophers lived in ancient Greece more than 2,000 years ago. Socrates, Plato, and Aristotle were the most important ancient Greek philosophers. Philosophy was very important in the 1700s, too, during a time called the Enlightenment. The ideas of Enlightenment thinkers, who were called the philosophes, helped lead to the American and French revolutions.

► More to explore

Enlightenment • Greece, Ancient

Phnom Penh



Population
(2005
estimate), urban
area,
1,364,000

Phnom Penh is the capital of Cambodia, a country in Southeast Asia. It is the largest city in Cambodia by far.

Phnom Penh is a major river port and trading center. It is also Cambodia's main center of business and industry. Tourism also brings money to the city.

In 1434 the Khmer people built Phnom Penh to be the new capital of their king-



The Royal Palace in Phnom Penh, Cambodia, is built in the traditional Cambodian style.

dom. In 1865 the king of Cambodia made Phnom Penh the country's capital. The French ruled Cambodia from the city from 1886 until the 1950s.

Cambodia became an independent country in 1953. As its capital, Phnom Penh grew into a large center of culture and education.

In 1975 Communist rebels called the Khmer Rouge seized power in Cambodia. They forced most of Phnom Penh's citizens to work on farms in the countryside. The city lost almost all its people. The Khmer Rouge were forced out of power in 1979. Afterward Phnom Penh grew into a large city again.

► More to explore

Cambodia • Mekong River

Phoenicia

Phoenicia was an ancient region at the eastern end of the Mediterranean Sea. It

covered the land where the country of Lebanon is today. The people who lived there were called Phoenicians. They traded with many other peoples and set up many colonies.

The Phoenicians lived on the seacoast and made their living from the sea. They were skilled shipbuilders and navigators. Their trade routes reached as far as Spain and the British Isles. The Phoenicians traded wood, linen, dyes, and wine. They also carved wood and ivory and worked with metals and glass. The art of glassblowing was probably invented in Phoenicia.

The Phoenicians spoke a language that was similar to Hebrew. They had their own form of writing and an alphabet of 22 letters. The Phoenician alphabet was the source of the Greek alphabet and of the Latin alphabet, which most people use today.



A stone carving from the 1st century AD shows the kind of ship that the Phoenicians used on the Mediterranean Sea.

Historians think that the Phoenicians arrived in Phoenicia in about 3000 BC. They probably came from the region of the Persian Gulf, to the southeast. They built the cities of Sidon, Tyre, and Berot (modern Beirut). The Phoenicians set up colonies all around the Mediterranean. Carthage, in North Africa, was a very successful colony that became a power in its own right.

Over the centuries a number of foreign powers controlled all or parts of Phoenicia. They included Egypt, Assyria, Babylonia, and Persia. The Macedonians, led by Alexander the Great, conquered Phoenicia in 332 BC. In 64 BC Phoenicia became a part of the Roman Empire.

► More to explore

Carthage • Colony • Lebanon
• Mediterranean Sea

Phoenix

► see Animals, Legendary.

Phoenix



Population
(2000 census),
city, 1,321,045;
(2007 estimate)
1,552,259

Phoenix is the capital of the U.S. state of Arizona. It is one of the largest cities in



Giant saguaro cacti grow in the Tonto National Forest east of Phoenix, Arizona.

the United States. It lies on the Salt River within the Sonoran Desert. Mountains surround the city. Its warm, sunny climate has made it a popular vacation spot.

Many people in Phoenix work for the government. Many others work in tourism, health care, or other service industries. Factories in and around Phoenix make spacecraft, aircraft, electronics, and computer parts.

Phoenix lies in a dry area. The city developed as people were able to bring water there. In ancient times a Native American people called the Hohokam lived in the area. They dug canals from the Salt River to carry water to their crops.

In modern times there were no towns in the Phoenix area until the late 1800s. In 1867 a businessman named Jack Swilling built new water canals in the area. New farms were soon established there. Phoenix grew near the farms.

The capital of the Arizona Territory was moved to Phoenix in 1889. In 1912 Arizona became a U.S. state with Phoenix as its capital.

Roosevelt Dam was built on the Salt River in 1911. The dam allowed much more water to be brought to Phoenix. The city grew very quickly after that.

► More to explore

Arizona • Hohokam Culture

Photography

Using a camera to take photographs is called photography. A photograph is an image, or picture, that has been captured on film or some other material. People who take pictures are called photographers.

Uses of Photography

Photography is a useful form of communication. Photographs give information

about people, places, objects, and events that words may not be able to describe.

Newspapers and magazines have printed photographs of interesting people and events since the 1800s. Advertisers and other businesses use photography to show people their products. Scientists, doctors, and police officers use photography to record important information.

Photography is a form of art as well. Many museums and galleries display photographs created by artists.

Finally, photography is a very popular hobby. People take photographs of places they visit. They also photograph important family events, such as birthdays, holiday celebrations, graduations, and weddings.

Making Photographs

Photographers use cameras to take pictures. Traditional cameras use film to record images. Other cameras, called digital cameras, use computer chips.

Film is a thin, see-through material. It has a special coating that goes through chemical changes when light comes into the camera from the outside. These changes create the image. After taking pictures, the photographer takes the film out of the camera. Then the photographer treats the film with more chemicals. This process is called developing. It creates a photographic negative. On a negative, dark areas of the image are light and light areas are dark. Photographers create prints, or photographs, by passing light through the negative onto



A young photographer learns to develop photographs. The room she works in has special lighting because ordinary light would spoil the images on the film.

special paper. One negative can make many prints.

Digital cameras and cell phones do not use film. They turn images into electric signals, which they store on microchips. People can load images from a digital camera or a cell phone onto a computer. Then they may use their computer's printer to print the images. Or they may send the images to a company that can print them on special photograph paper.

Cameras have features that allow photographers to control how the image is created. One feature is the shutter, which controls the amount of light that enters the camera. A photographer can adjust the shutter to create certain effects with the light. Another feature is the lens, which focuses the light. One special type of lens allows the camera to capture a wider view than a regular lens would. Another lens can make objects far away look much closer than they are.

History

Louis Daguerre of France invented one of the earliest forms of photography in 1837. Daguerre's camera recorded images on metal plates. His photographs were called daguerreotypes. The main problem with daguerreotypes was that no copies could be made of the original image.

A few years after Daguerre's invention, British scientist William Henry Fox Talbot invented a way to produce paper negatives. This made it possible to print any number of photographs from a



A photographer prepares to photograph a woman in his studio in about 1900.

single negative. Photographers still use this method today.

Early photography was difficult because cameras were large and heavy. They recorded images on stiff plates instead of film. In the late 1800s the U.S. inventor George Eastman invented flexible film and a small, easy-to-use camera. Eastman's inventions made it possible for anyone to take photographs.

Before 1907, when color film was invented, camera film was black and white. Black-and-white film that developed itself appeared in 1947. This type of film was used in a special camera, called a Polaroid Land camera. The film came out of the camera after a picture was taken and revealed an image within minutes. Color Polaroid film became available in 1963. Digital cameras appeared in the 1990s.

► More to explore

Arts • Camera • Communication
• Hobby • Light

Photosynthesis

Photosynthesis is the process in which green plants use sunlight to make their own food. Photosynthesis is necessary for life on Earth. Without it there would be no green plants, and without green plants there would be no animals.

Photosynthesis requires sunlight, chlorophyll, water, and carbon dioxide gas. Chlorophyll is a substance in all green plants, especially in the leaves. Plants take in water from the soil and carbon dioxide from the air.

Photosynthesis starts when chlorophyll absorbs energy from sunlight. Green plants use this light energy to change water and carbon dioxide into oxygen

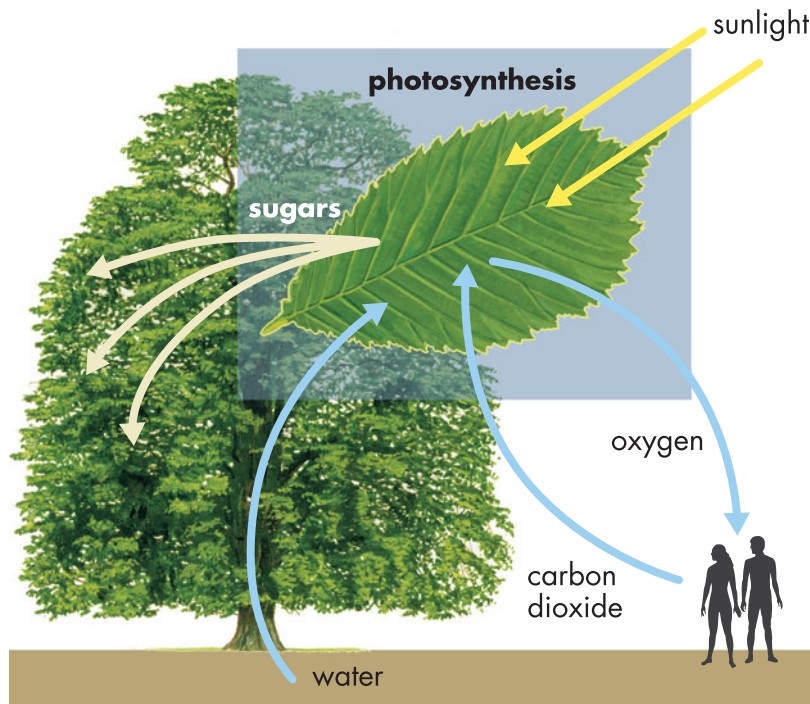
and nutrients called sugars. The plants use some of the sugars and store the rest. The oxygen is released into the air.

Photosynthesis is very important because almost all living things depend on plants for food. Photosynthesis is also important because of the oxygen it produces. Humans and other animals need to breathe in oxygen to survive. Without photosynthesis, all Earth's oxygen would be used up.

Some living things other than plants also make their own food through photosynthesis. They include certain types of bacteria and algae.

► More to explore

Energy • Plant



Green plants such as trees use carbon dioxide, sunlight, and water to create sugars. Sugars provide the energy that makes plants grow. The process creates oxygen, which people and other animals breathe.

Physics

Physics is one of the major branches of science. People who work in physics are called physicists. Physicists study matter and the forces (pushes or pulls) that act on it. (Matter is what makes up all physical objects.) Physicists also study many different forms of energy. The objects that physicists study range in size from the tiny building blocks of matter to huge groups of stars.

Fields of Study

Physics is divided into many fields of study. Mechanics deals with the effect of forces on objects and the motions of objects. Acoustics is concerned with sound. Optics is the study of light. Thermodynamics deals with the form of energy called heat. Electronics and mag-



A young visitor to a science museum explores an electric spark generator. Museums can provide interesting ways to learn about physics.

netism are concerned with a basic property of matter called electric charge. Atomic physics concerns the structure of atoms (the building blocks of matter) and the forces that act on them. Quantum mechanics explains the behavior of very small particles—such as the particles that make up an atom.

History

Physics first developed as people began to wonder about the physical world around them. The ancient Greeks studied the motion of objects in the sky and the physical properties of things on Earth.

Early in the 1600s the Italian scientist Galileo studied how all things fall to Earth at the same speed. At the end of the 1600s the English scientist Isaac

Newton explained the laws of gravity (a force) and motion.

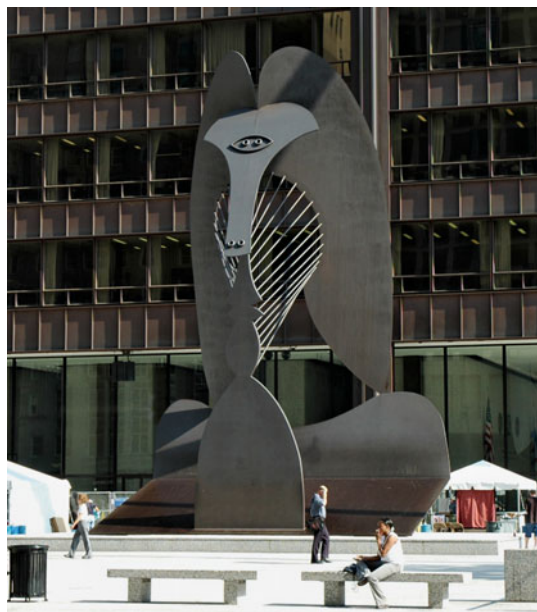
In the late 1800s scientists discovered that tiny particles make up atoms. In the early 1900s the German-American physicist Albert Einstein helped to explain the behavior of these particles. Einstein also proposed entirely new ways of thinking about space, time, and gravity.

► More to explore

Einstein, Albert • Electronics • Energy
• Force • Galileo • Gravity • Heat
• Light • Magnet and Magnetism
• Matter • Motion • Newton, Isaac
• Sound

Picasso, Pablo

Pablo Picasso experimented with many different styles of painting during his long career as an artist. His work was a



Picasso designed a steel sculpture for an outdoor site in Chicago, Illinois. The sculpture stands about 50 feet (15 meters) high.

major influence on the development of modern art. Picasso also created sculpture, prints, pottery, poetry, and ballet scenery.

Early Life

Pablo Ruiz y Picasso was born on October 25, 1881, in Málaga, Spain. He learned to draw from his father, a professional art teacher. Picasso held his first exhibition at age 13 and then studied at an art academy. But in 1899 he decided to break with his formal training and join a group of experimental artists.

Blue and Rose Periods

Picasso was deeply affected by the death of a close friend in 1901. He began painting images of death, poverty, and despair. He used mostly blue tones, so this part of his career is called his blue period.

Picasso moved to Paris in 1904. By 1905 he was painting in shades of rose, or pinkish red, and his subject matter was less sad. This rose period lasted until about 1907.

Cubism and Later Styles

With his painting *Les Femmes d'Alger* in 1907, Picasso touched new ground. It shows five nude women in flat, angled shapes. Two of their faces look like African masks. At the time many people found the painting shocking.

Picasso and another painter named Georges Braque then created a new

style of art called cubism. This style does not show people or objects in a realistic way. Instead the subjects are broken apart into many flat shapes. Several sides of the same subject might show at once.

Picasso later used more traditional painting styles and a less severe style of cubism. In 1937 he painted *Guernica*, which many consider his masterpiece. It shows images of suffering after the bombing of the town of Guernica during the Spanish Civil War. Picasso continued to work into his 90s. He died on April 8, 1973, in Mougins, France.

► More to explore

Painting • Sculpture

Pierce, Franklin



Franklin Pierce was the 14th president of the United States.

Franklin Pierce was president of the United States between 1853 and 1857. Slavery was then an important issue.

Did You Know?

Picasso designed costumes and scenery for five ballets performed by a Russian ballet company.



TIMELINE

Pierce is born in Hillsboro, New Hampshire.

November 23, 1804

Pierce is elected president.

1852

Pierce is elected to Congress.

1832

In the Gadsden Purchase, the United States gains land from Mexico.

1853

The United States tries to buy Cuba from Spain but fails.

1853

Pierce signs the Kansas-Nebraska Act, which leads to violence.

1854

Pierce dies in Concord, New Hampshire.

October 8, 1869

Early Life

Franklin Pierce was born on November 23, 1804, in Hillsboro, New Hampshire. His father, Benjamin Pierce, served as governor of that state. After graduating from Bowdoin College in Maine, Pierce studied law. He became a lawyer in 1827. In 1834 Pierce married Jane Means Appleton. They had three sons.

Political Career

Pierce entered the New Hampshire legislature in 1829. In 1832 he was elected to the U.S. House of Representatives. From 1837 to 1842 he served in the Senate. Pierce then practiced law in Concord, New Hampshire. During the Mexican War (1846–48) he served briefly as an officer.

By the 1850s both major political parties, the Democrats and the Whigs, were divided over the issue of slavery. In 1852 none of the best-known Democrats

could win enough support to become the party's presidential candidate. Pierce was not well known, but the Democrats eventually compromised by choosing him. Pierce defeated General Winfield Scott in the election.

Presidency

As president, Pierce focused on expanding U.S. territory. In 1853 he unsuccessfully tried to buy Cuba from Spain. In the same year, however, the United States bought almost 30,000 square miles (78,000 square kilometers) of land from Mexico in a deal called the Gadsden Purchase.

Pierce tried to satisfy both sides of the slavery debate. He appointed Northerners and Southerners to government posts. He also signed the Kansas-Nebraska Act in 1854. The act allowed the voters in the territories of Kansas and Nebraska to decide whether to allow slavery there. Violent clashes broke out

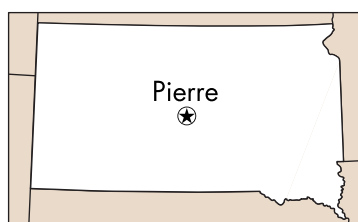
between proslavery and antislavery settlers in Kansas.

Because of the situation in Kansas, the Democrats chose another candidate for president in 1856. Pierce retired to Concord to practice law. He died there on October 8, 1869.

► More to explore

Buchanan, James • Gadsden Purchase
• Kansas-Nebraska Act • Slavery
• United States

Pierre



Population
(2000 census)
13,876; (2007
estimate)
14,032

Pierre is the capital of the U.S. state of South Dakota. The city lies on the Missouri River.

Farmers from the surrounding area go to Pierre to sell and ship out their cattle and crops. Many people in the city work for the government. Tourism also brings money to Pierre. The region's lakes attract tourists to the city.

Before 1800 the Arikara Indians had their capital in the Pierre area. Pierre was founded in 1880. It was named after the French fur trader Pierre Chouteau, Jr. The city grew because it was an important stop on the railroad used by the local mining industry. It was also a trade center for a large area. In 1889 South



The South Dakota state Capitol in Pierre was finished in 1910.

Dakota became a U.S. state with Pierre as its capital.

► More to explore

South Dakota

Pig

Pigs are stout, barrel-shaped mammals. Some kinds of pigs are wild, while others are domestic (raised by humans). Farmers raise domestic pigs for their



Piglets stay close to their mother.

meat, which is called pork, and their fat, which is called lard. The skin of pigs is made into leather. Their stiff hair is used for brush bristles.

Several different names are used to describe pigs. Both wild and domestic pigs are also called swine. Domestic pigs that weigh more than 120 pounds (50 kilograms) are called hogs. That term can also be used to describe wild or domestic pigs in general. Before giving birth a female pig is called a gilt. After her first litter she is called a sow.

Where Pigs Live

Domestic pigs live on every continent except Antarctica. Several types of wild pig are found in Europe, Asia, and Africa. They live in forests and grasslands. China has the world's largest population of domestic pigs, followed by the United States.

Physical Features

A pig has a bulky body with short legs. It has thick skin covered with a coat of stiff hairs. Pigs range in length from about 2 to 7 feet (0.6 to 2.1 meters) long. Domestic pigs can weigh as much as 700 pounds (320 kilograms). The largest wild pig, called the wild boar, is smaller.

A pig's snout ends in a flat, rounded disk. Pigs use their snout to find food in the ground and dig it out. Wild pigs have sharp tusks to dig with, too. They also use their tusks as a weapon to defend themselves. Domestic pigs do not have tusks, but they have tusklike teeth.



The bush pig is an African wild pig that is known for its long hair.

Behavior

In the wild, female pigs live together peacefully. But males fight, so they usually live alone. Wild pigs eat a wide variety of foods, including leaves, roots, fruit, reptiles, and rodents. Domestic pigs eat grains and food waste.

A female pig gives birth after a pregnancy of about four months. The average litter includes about 10 or 11 baby pigs, called piglets.

► More to explore

Mammal

Pigeon and Dove

The bird called the domestic pigeon is a familiar sight on city streets. It is only one species, or type, of pigeon. About 250 species of pigeons and doves are found around the world. These birds make up the scientific family Columbidae. Often the larger members of the family are called pigeons, and the smaller ones are called doves. But there is no clear distinction between the

names. For example, the traditional “dove of peace” is a white domestic pigeon.

Pigeons and doves are found nearly all over the world. They live in farmlands, woodlands, deserts, and cities.

Physical Features

These birds have plump bodies with short necks, small heads, and long wings. They range in length from about 6 to 33 inches (15 to 84 centimeters). Many of them are gray, brown, black, or white. They are strong fliers. On the ground a pigeon or dove struts about, bobbing its head up and down.

Behavior

Most pigeons and doves eat mainly seeds, which they pick up from the ground. Some types eat leaves or fruit.

Pigeons and doves are the only birds to feed their young a liquid called milk. Both parents produce the “milk” from a

gland in the throat. The parents typically stay together for as long as they live.

Relationship to Humans

Pigeons and doves have an excellent sense of direction. For thousands of years people have trained pigeons to carry messages over long distances. A trained bird can find its way home after being carried hundreds of miles away.

People also hunt pigeons and doves for sport. Hunters killed so many passenger pigeons that this type became extinct, or died out. The last one died in 1914. Since then people have tried to limit the numbers of birds hunted.

► More to explore

Bird

Pilgrimage

A journey to a holy place is called a pilgrimage. A person who makes such a journey is a pilgrim. Pilgrimages have been a part of the world’s major religions since ancient times.

People go on pilgrimages for many reasons. Some religions require or encourage believers to make a pilgrimage as an expression of faith. People may also journey to a shrine because they want a favor, such as a cure for an illness, from a saint or divine being. Others give thanks or ask to be forgiven for a wrong they have done.

The first Christian pilgrims traveled to Jerusalem, where Jesus died. Those first



The mourning dove is a common bird of North America.



Hindu pilgrims bathe in the Ganges River in India.

pilgrimages took place in the AD 100s. In later years, Muslims controlled Jerusalem, which often made the pilgrimages impossible. Christians started a series of wars known as the Crusades partly so that Christian pilgrims could again travel to Jerusalem.

Modern Christian pilgrimage sites have included places where people are thought to have seen visions of the Virgin Mary. They include Lourdes, France, and Fátima, Portugal.

Every follower of Islam who can manage the journey is required to make a pilgrimage to the holy city of Mecca, Saudi Arabia, where Muhammad was born. This pilgrimage is called the hajj. In Mecca the pilgrim must walk seven times around a sacred shrine called the Kabah and touch a black stone in one of its walls. Muslims believe that this stone

was given to Adam when he was forced out of the Garden of Eden.

In Hinduism, certain places are considered holy because of a connection with a historical event, a legendary person, or a god. Many Hindu pilgrimage sites lie along India's rivers, especially the Ganges. For Hindus, bathing in a holy river symbolizes the washing away of sin. A yearly bathing festival for hundreds of thousands of pilgrims takes place on the Ganges near Allahabad.

The pilgrimage centers of Buddhism are tied to the life of the Buddha. The most important pilgrimage site for Buddhists is Bodh Gaya, in northeastern India. This is where the Buddha is said to have become enlightened (or awakened to the truth about life). Most Buddhist countries now have their own shrines at which pilgrims gather.

► More to explore

Crusades • Ganges River • Jerusalem • Mecca

Pima

The Pima are Native Americans who live in southern Arizona. They call themselves the Akimel O'odham. The Pima are related to the Tohono O'odham people. They are probably descendants of the ancient Hohokam Indians.

The Pima traditionally lived in round, one-room houses. The houses had pole frames and walls of grass and mud. The Pima were farmers who built canals (artificial waterways) to carry river water

Did You Know?

In ancient times Jewish men were expected to make pilgrimages to Jerusalem during three yearly festivals.



Pima women used curved sticks to play a game.

to their fields. They grew corn, squash, pumpkins, kidney beans, tobacco, and cotton. They gathered cactus fruits and other wild plants. They also fished and hunted small animals, including jackrabbits.

Spanish explorers arrived in the land of the Pima in the 1690s. The Spanish taught the tribe how to grow barley and wheat and how to raise sheep and cattle.

In 1853 the tribe's land became part of the United States. Then whites began settling there. They changed the direction of rivers to water their own fields. The Pima eventually lost much of their land. They kept one reservation on the Gila River and another on the Salt River. At the end of the 20th century there were about 8,500 Pima living in the United States. Most lived on the tribe's reservations in Arizona.

► More to explore

Hohokam Culture • Native Americans
• Tohono O'odham

Pine

Pines are believed to be among the oldest trees on Earth. Some can live as long as 6,000 years. There are 90 species, or types, of pine. They are most common in the mountains.

Pines vary widely in size. Some are only a few feet tall. Others grow taller than 200 feet (61 meters). Pines have thin leaves that are called needles. Pines are evergreens, which means that they do not lose their leaves in autumn. Pines contain a liquid called resin. It fights infection. Pines burn easily because of their resin.

Pines belong to the group of trees called conifers, which means that they produce cones. Both male and female cones grow on a pine tree. Usually the male cones grow on the lower branches of the tree. Male cones are less than 1 inch (2.5 centimeters) long. They are smaller than the female cones. Female cones are usually called pinecones.



Pine trees grow in Tongass National Forest in Alaska.

In spring or early summer pollination occurs. In this process the male cone releases tiny grains called pollen. The pollen is then carried by the wind to the female cone. Over the next several years the female cone makes seeds. These seeds can become new plants.

Pine trees are a major source of timber. Their wood is used in construction and to make paper. The resin of pine trees is used to make paints, turpentine, and varnishes. Pine oil can be used as medicine.

► More to explore

Conifer • Tree

Pineapple



A pineapple fruit rises out of a cluster of sword-shaped leaves.

Pineapples are sweet, juicy fruits. They grow on a plant with the scientific name *Ananas comosus*. *Ananas* means “excellent fruit” in an Indian language from South

America. Pineapples are native to warm regions of the Americas.

Pineapples now grow in tropical (warm) areas around the world. The leading producers of pineapples include Thailand, the Philippines, India, China, Brazil, and the U.S. state of Hawaii.

Pineapples grow on plants that have leaves shaped like long swords. The plants also have purple flowers and smaller leaves. As they grow, these flowers and leaves join together to form the pineapple fruit.

A ripe pineapple looks like a cactus. The outer peel is very tough. It has sections that look like eyes. Each “eye” is formed from one flower. A group of leaves grows out of the fruit’s top. These leaves are called the crown. The inside of the fruit is fleshy and yellow.

Some pineapple plants do not produce seeds. In such cases, new plants are grown from cuttings, or pieces of the plants. Farmers prepare for planting by laying a covering of heavy paper or plastic over the soil. Then they plant the cuttings through holes in the covering. The covering protects the young plants.

Pineapples can be eaten fresh or canned. In some areas people use them in baked desserts. Pineapple leaves contain a silky fiber. In the Philippines people weave the fiber into a delicate fabric called piña cloth.

► More to explore

Fruit

Did You Know?

Christopher Columbus and other early explorers found the pineapple growing in the West Indies.

Pioneer Life

Pioneers were men, women, and children who started new lives on the U.S. frontier in the 1800s. After a long journey from the East, they built simple homes and small farms. They often lived miles from any neighbors and worked hard every day to survive.

Moving Westward

Pioneers had different reasons for moving westward. Many settlers went west during the California gold rush of 1849. Others wanted a piece of free land, which the U.S. government began giving away in the 1860s. Some groups were looking for religious freedom. Many former slaves wanted to start a new life after the Civil War ended in 1865.

The trip west was difficult. Many pioneers traveled in covered wagons pulled by horses, mules, or oxen. They often followed well-worn paths such as the Oregon Trail or the Santa Fe Trail.



Pioneers on the prairies built houses out of sod if they could not find trees to use for wood.

Along the way, pioneers and Native Americans sometimes fought. Many pioneers died from accidents and disease. In 1869 railroads linked the East and West coasts. However, pioneers used the wagon trails until about 1880.

Pioneer Settlements

Early pioneers made houses out of sod, or bricks of dirt and prairie grass. Others lived in dugouts, or spaces dug out of a hillside or the ground. Still others made houses out of logs and mud. Most homes had dirt floors, a fireplace, and a chimney. The simple furniture was usually made of wood.

Towns developed only as more people settled in the area. This meant that pioneer families had to do everything on their own. They grew crops and raised farm animals for milk, eggs, and meat. In the winter they hunted and ate preserved food, including beans and grains. Pioneers also made their own clothes out of wool, flax, old cloth, and leather.

► More to explore

American Civil War • Gold Rush
• Oregon Trail • Santa Fe Trail

Pirate

Pirates are criminals who attack ships at sea. The most famous pirates sailed the seas from the late 1500s to the early 1800s. A common symbol of piracy was the Jolly Roger—a black flag with a white skull and crossbones.

Many of the ideas that people have about pirates have come from books and



Blackbeard was an English pirate of the early 1700s. His real name was Edward Teach.

movies. These tell of lives of adventure and buried treasure. The stories are a mix of fact and fiction. For example, there are many colorful stories about characters named Henry Morgan, Captain Kidd, and Blackbeard. The stories are mostly made up, but the characters were actual people, and they were pirates.

A Pirate's Life

Real pirates used ships that were small and swift. They could attack much larger, better-armed ships. Armed with swords and pistols, they went aboard the other ship. Pirates not only stole a ship's cargo—they also took the ship itself. Pirates sold the ships that they captured or made them into pirate ships. Sometimes pirates held the ship's passengers or crew for ransom. This means that

they demanded money before they would release their captives.

Some pirate crews obeyed strict rules on their ships. Death could be the punishment for stealing another man's share of the loot. Women were not allowed on board pirate ships. However, there were some women pirates. They disguised themselves as men in order to join pirate crews.

History

In ancient times pirates from Phoenicia, Greece, and Rome threatened ships in the Mediterranean Sea. About a thousand years ago some of the Viking warriors in northern Europe committed piracy.

Pirates are now criminals throughout the world. However, there was once a legal form of piracy called privateering. Privateers were privately owned ships that had a government's permission to attack an enemy's cargo ships. The privateer's owners and crew got to keep the cargo they captured.

During the 1500s many Spanish ships carried treasure from Mexico back to Europe through the Caribbean Sea. They were attacked by pirates and by privateers such as the Englishman Sir Francis Drake. Caribbean pirates of the 1600s were known as buccaneers.

In the Mediterranean Sea, dangerous pirates received support from countries along the Barbary Coast of North Africa. These countries were called pirate states. The British, French, and U.S.

Did You Know?

Buccaneers were originally French, Dutch, and English sailors, many of whom had left their countries to escape the law.

navies ended piracy in this region in the early 1800s.

Piracy and privateering decreased in the 1800s and 1900s, but it still exists. For example, pirate attacks are still a threat to shipping in the South China Sea and off the northern coast of Africa near Somalia. Modern pirates do not sail the seas on pirate ships. Instead they attack from the coast using speedboats and small gunboats.

► More to explore

Drake, Francis

Pitcher Plant



Pitcher plants have special leaves that they use to trap insects.

Most plants get the nutrients that they need from soil. Pitcher plants also get nutrients by catching and digesting insects. For this reason they are called carnivorous, or meat-eating, plants.

There are several different species, or kinds, of pitcher plant. Some are related to the Venus's-flytrap, another carnivorous plant. Many types of pitcher plant grow in North and South America, but some species grow in other parts of the world.

Pitcher plants have structures shaped like pitchers, bowls, or trumpets. In some types the structures make up the whole of the plant's leaves. In other types the structures are just part of the leaves. In these types the structures grow at the ends of stringlike parts called tendrils. The purple, or common, pitcher plant has green to reddish leaves and purple-red flowers. The yellow, or trumpet, pitcher plant has green, trumpet-shaped leaves and bright yellow flowers.

Most types of pitcher plant catch and digest prey in a similar way. Glands in a plant's pitcher produce nectar. Nectar is a sweet, sometimes sticky liquid that attracts insects. Once an insect crawls into the pitcher, it falls into a pool of enzymes, or digestive juices. These enzymes dissolve the insect's soft parts. The plant then absorbs the soft parts through the walls of the pitcher.

► More to explore

Insect • Plant • Venus's-flytrap

Pizarro, Francisco

Francisco Pizarro was a Spanish explorer and adventurer. He conquered the Inca, who had established an advanced



Francisco Pizarro

civilization in South America. Pizarro also founded the city of Lima, now the capital of the South American country Peru.

Francisco Pizarro was born in Trujillo, Spain, in about 1475. His father was an army captain. As a young man Pizarro explored Central America.

Pizarro heard stories of a large and wealthy empire in South America. In 1523 he made a plan to take the Inca lands for Spain. Few people believed he could succeed. Early expeditions failed, but in 1531 he reached the lands of the Inca in what is now Peru.

On November 15, 1531, Pizarro and his men entered the Inca city of Cajamarca. The Spaniards had better weapons and easily defeated the Incas. Pizarro and his men took gold and silver from the Inca

and killed their emperor. Pizarro went on to take control of all of Peru.


In 1535 Pizarro founded the city of Lima. The city was the center of Pizarro's new government. But there was trouble between Pizarro and another Spaniard named Diego de Almagro. Almagro's followers killed Pizarro on June 26, 1541.

Plague

In the 1300s a disease called the plague killed about 25 million people in Europe. The plague became known as the Black Death because of the black patches that appeared on a victim's skin. Today people commonly use the word plague in two ways. They use it to refer to the disease itself. They also use it to mean a large outbreak of any dangerous disease. In the second case "plague" has the same meaning as the word epidemic.



An old illustration shows a doctor visiting a patient infected with the plague.



Did You Know?

Rats traveling aboard ships have spread plague to all areas of the world.

Plague is caused by tiny living things called bacteria. It is mostly a disease of rats. Fleas that bite infected rats pick up the plague bacteria. They then spread it to other rats or to people through bites. Infected people sometimes spread the disease to others when they cough.

Once inside a person's body, the plague bacteria enter the bloodstream. They travel to the liver, spleen, kidneys, lungs, and brain. Fever, weakness, headache, and shaking chills quickly develop. The most common form of plague, called bubonic plague, also causes swelling in a person's lymph nodes. (The lymph nodes help to protect the body from disease.) Swollen nodes are called buboes, which is why this form is called bubonic plague. Pneumonic plague mostly infects the lungs. Septicemic plague mainly infects the bloodstream.

Outbreaks of the plague are now rare. Because cities are cleaner than they used to be, there are fewer infected rats and fleas to spread the disease.

► More to explore

Bacteria • Disease, Human • Epidemic
• Flea • Rat

Planets

Planets are large natural objects that orbit, or travel around, stars. Eight planets orbit the star called the sun. In order from the closest to the sun, these planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The solar system is the collection of the sun

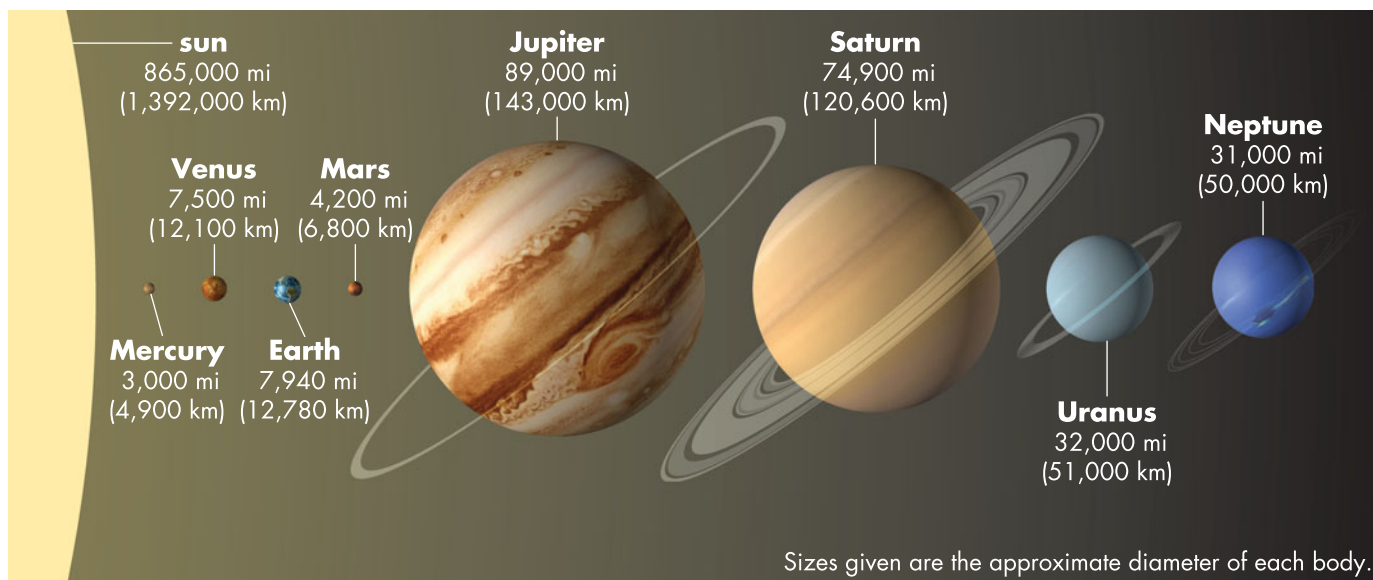
and the objects that orbit around it, including the eight planets.

Planets differ from other objects such as comets, asteroids, and meteors. In general, planets are the largest objects in the solar system after the sun. Most of them orbit the sun in a path shaped like a circle. They also have an atmosphere, or a layer of gases surrounding them. Most of the planets have at least one moon.

However, scientists have long debated what makes a planet a planet. For many years most people believed that there were nine planets in the solar system. This number included Pluto, which was discovered in 1930. Pluto is a planetlike object that is usually beyond Neptune. But Pluto orbits the sun in a different way than the eight planets do. Pluto's orbit overlaps the orbit of Neptune. Also, Pluto is much smaller than the eight planets. In 2006 a large group of scientists decided to make a new category for Pluto and similar objects in the solar system. They called the objects dwarf planets.

Types of Planets

There are two main types of planets in the solar system. The four planets nearest the sun—Mercury, Venus, Earth, and Mars—are called inner planets. They are rocky planets about the size of Earth or somewhat smaller. Jupiter, Saturn, Uranus, and Neptune are called gas giants. They are made up mostly of gases and have no solid surfaces. They are all much larger than Earth. Also, the gas giants each have many moons and a system of



Mercury, Venus, Earth, and Mars are rocky planets. They are closer to the sun than Jupiter, Saturn, Uranus, and Neptune, which are gas giant planets.

rings. Saturn's rings are the largest and best known.

Motion

Planets move in two ways. Each planet travels around the sun in a path called an orbit. The time it takes a planet to complete one orbit is equal to a year on that planet. For example, Earth completes one orbit every 365 days, so a year on Earth is that long.

Each planet also rotates, or spins about its center. As the planet spins, it turns different sides toward and then away from the sun. In one day, a person on the planet would see the sun appear overhead, then set, then rise overhead again.

On most planets, a day is roughly equal to the time it takes the planet to complete one rotation. For example, Earth completes one rotation in about 24 hours, and a day on Earth lasts 24

hours. Mercury and Venus are different because they spin slowly. By the time they complete one rotation, they have traveled very far in their orbit. A different part of the planet is then facing the sun. Therefore their day is not yet complete. It takes much longer for the same part of the planet to face the sun again.

Other Planets

In the 1900s scientists began to discover planets outside the solar system. These planets orbit around stars other than the sun. It is difficult to tell much about such planets because they are so far away. Scientists can find them by looking for certain tiny changes in the position and light of stars. These changes occur when a planet travels around a star.

► More to explore

Earth • Jupiter • Mars • Mercury
 • Neptune • Saturn • Solar System • Sun
 • Uranus • Venus

Plankton

Countless tiny living things float and drift in the world's oceans and other bodies of water. These living things, or organisms, are known as plankton. They include plants, animals, and other kinds of organisms. Plankton have an important place in the food chain that supports fish and other sea creatures—and the people who eat them.

Types of Plankton

Plankton that is made up of plants or plantlike organisms is called phytoplankton. These organisms are often no larger than a single cell. For example, a single-celled type of algae, called a diatom, is a common form of phytoplankton. Phytoplankton floats near the surface of the water. Like other plants it uses sunlight to produce energy and then releases the gas oxygen. This process is called photosynthesis.

Plankton that is made up of animals or animal-like organisms is called zooplankton. Some of these organisms,

such as miniature crustaceans and protozoans, are very small. Others, such as jellyfish, are larger. Some fishes and shellfish begin their lives as eggs or tiny larvae. These eggs and larvae are also zooplankton.

Besides phytoplankton and zooplankton, bacteria and fungi float in the world's waters. These living things may also be considered plankton.

Importance

Plankton is very important to life on Earth. Phytoplankton produces much of the oxygen that people and animals need to survive. Plankton is also a major source of food. Zooplankton feeds on phytoplankton. In turn, fish and other larger animals eat the zooplankton. Many types of whale feed on zooplankton. The huge whales catch the tiny plankton by using a series of filters, called baleen, in their mouths.

► More to explore

Algae • Crustacean • Food Chain
• Photosynthesis • Protozoan



An almost transparent zooplankton is seen in an enlarged view.

Plant

Hundreds of thousands of different species, or kinds, of plant grow on Earth. Some plants are so tiny that people can hardly see them. Others are trees that grow as tall as skyscrapers.

Most plants have several things in common. They need sunshine, water, and air to grow. They are not able to move around. Their cells have stiff walls made of a tough material called cellulose. All

green plants use the sun's energy, water, and a gas called carbon dioxide to make their own food. This process is called photosynthesis.

Where Plants Grow

Plants grow nearly everywhere on Earth. Most plants grow in soil. They get the water and nutrients they need from the soil. But some plants do not need soil. Plants called epiphytes grow on hard surfaces, such as other plants or rocks. They get most of the water and nutrients they need from rain and the air. Still other plants float in water. A few species of plant live on and get their nutrients from other plants.

Types

All plants belong to one of two main groups, vascular plants and nonvascular plants. Vascular plants have special tissues, called xylem and phloem, that carry water and food throughout the plant. Vascular plants also have roots, stems, and leaves. Vascular plants include herbaceous plants, shrubs, and trees. Herbaceous plants have soft stems. Shrubs and trees have woody stems.

Nonvascular plants do not have xylem or phloem. They also lack true roots, stems, and leaves. Nonvascular plants include mosses, liverworts, and hornworts. They are generally small and grow in moist places.

Reproduction

Plants reproduce, or make more of their kind, either by seeds or spores. Seeds and spores are small structures that



Most plants grow flowers of some kind. The flowers are where the plant produces its seeds.

develop on plants and then fall off. They then may grow into new plants. Seeds are larger and more complex than spores.

Most vascular plants reproduce by seeds. Most seed-bearing plants grow flowers. Fruits grow from the flowers, and seeds grow inside the fruits.

Other vascular plants do not grow flowers or fruits. For example, the plants



Plants called conifers have cones that contain the plant's seeds.

How a plant grows from a seed



A bean is the seed of a bean plant. When the seed germinates, or starts to grow, small parts inside the seed grow into the root and stem. Most of the seed is used for food by the young plant. When the plant grows green leaves it begins to make its own food by photosynthesis.

called conifers form their seeds inside cones. Conifers include pines, spruces, firs, and similar trees and shrubs.

Nonvascular plants reproduce by spores. A few kinds of vascular plants, such as ferns, also reproduce by spores.

Sometimes plants can reproduce without spores or seeds. Stems, leaves, or other parts of a plant may grow into new plants. For instance, strawberry plants grow runners, or stems that creep along the ground. These stems may form roots and grow into new plants.

Importance

Without plants, no other living thing could survive. Plants provide food for

people and animals. They also make the oxygen that other living things breathe. They produce the oxygen as part of the process of photosynthesis.

Human beings use plants in countless ways. They get many foods, drinks, and flavorings from plants. They build homes from wood and many other parts of plants. People also burn wood for heat and energy.

Many of the fibers used to make cloth come from plants, especially cotton. A type of cloth called linen is made from the flax plant. Other useful things made from plants include medicines, paper, chewing gum, cork, rubber, and cocoa butter.

People also use flowers for decoration. They plant trees and flowers in their yards and in large formal gardens.

► More to explore

Conifer • Fern • Fibers • Flower
• Garden • Leaf • Moss • Photosynthesis
• Root • Seed • Tree

Plastic



Women sort plastic containers for recycling.

A plastic is a kind of material that is made by people and can be formed into almost any shape. Most plastics are strong, long-lasting, and lightweight. They resist damage by water, heat, chemicals, and electricity. In addition, plastics can be made in many colors.

Plastics have countless uses. Manufacturers often use plastics in place of more expensive materials. In nylon stockings, for example, plastic takes the place of silk. In vinyl house siding, plastic takes

the place of wood. In many automobile parts, plastic takes the place of metal.

Making Plastics

Most plastics are made from chemicals that come from petroleum (oil), natural gas, or coal. Heating these chemicals causes them to break down into molecules. (Molecules are groups of two or more atoms, which are the tiny building blocks of everything.) Scientists then join these molecules into chains. These chains make up plastics. Different combinations of molecules form different kinds of plastic.

Plastics can be made into almost any shape by heating them at a high temperature. The heat softens the plastic, which can then be poured into a mold. As the plastic cools, it hardens. When reheated, some types of plastic will soften again. The plastic can then be made into new shapes. Other types of plastic will stay hard even when reheated.

History

In 1869 John Wesley Hyatt, a U.S. inventor, made the first plastic. He called it celluloid because he made it from a plant material called cellulose. In 1909 a U.S. chemist named Leo H. Baekeland developed the first plastic made completely from synthetic (human-made) materials. Baekeland named the new material Bakelite. Scientists have developed many more plastics since then.

► More to explore

Molecule • Petroleum

Did You Know?

Some plastics can be recycled by being ground up and made into such products as plastic lumber and filler for down jackets and sleeping bags.

Plate Tectonics

The theory, or idea, of plate tectonics says that Earth's outer layer, or crust, is made up of large, moving pieces called plates. All of Earth's land and water sit on these plates. Under the plates is a layer of melted rock called magma. The plates float on top of the magma.

Plate Movements

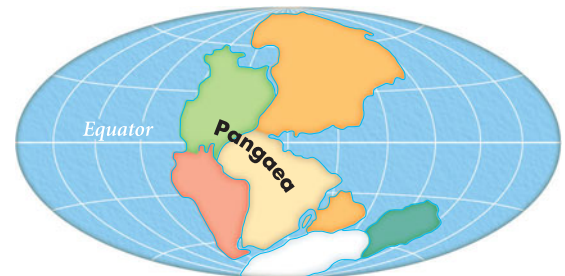
As the plates move they come into contact with each other. One of three things happens at these plate boundaries. First, the plates may move past each other in opposite directions. Second, the plates may crash into each other. In this case the edge of one plate may slide under another plate and be destroyed. Or the two edges of the plates may rise up and form mountains. Third, magma may rise to the surface and force the plates to move apart. As the rising magma cools, it hardens to create new crust.

Earthquakes and volcanoes often happen along plate edges. Many happen around the plate under the Pacific Ocean.

Continental Drift

The plates have moved across Earth's surface for hundreds of millions of years. As the plates move, the continents on them move, too. This movement is called continental drift.

Scientists think that all the continents were once joined together in one big continent. This supercontinent, called Pangaea, had formed by about 250 million years ago. Pangaea lay across a plate



225 Million Years Ago



180–200 Million Years Ago



135 Million Years Ago



Earth Today

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boundary. Slowly, Pangaea broke apart at this boundary. Rising magma filled in the space, which eventually became the floor of the Atlantic Ocean.

One piece of Pangaea included parts of what are now North America, Europe, and Asia. This piece, called Laurasia,



The plates that make up Earth's crust are all different shapes and sizes.

drifted north. The other piece of Pangaea included parts of what are now Antarctica, Africa, South America, and Australia. This part, called Gondwanaland, drifted south. Eventually Laurasia and Gondwanaland broke apart, too. The continents then slowly moved to the places they are now.

The continents continue to move today. Scientists believe that in about 250 million years they will join together again.

► More to explore

Continent • Earth • Earthquake
• Mountain • Volcano

Platypus

The platypus is an unusual mammal of eastern Australia and Tasmania. The

platypus and its relatives the echidnas are the only mammals that lay eggs. The platypus also looks odd. It has a “bill” and webbed feet like a duck and a flat tail like a beaver. The platypus is sometimes called a duckbill. Its scientific name is *Ornithorhynchus anatinus*.

The platypus has a squat body with short legs. It is about 15 to 24 inches (38 to 60 centimeters) long, including the tail. It has thick brown fur. Its eyes, ears, and nostrils close underwater.

Male platypuses have a sharp spur on each back foot. The spurs are connected to glands that make poison. The males use their spurs to fight each other, especially during mating season. The poison can cause great pain.

Did You Know?

When European scientists first saw stuffed platypuses, they thought they were fake. They changed their minds only after seeing live platypuses.



The platypus uses its strong front limbs for swimming as well as for digging.

The platypus lives in and near rivers and lakes. It eats insects, worms, shellfish, fish, frogs, mollusks, and tadpoles. The amount of food it eats every day is almost equal to its own weight.

About two weeks after mating, a female platypus lays one to three eggs. The babies hatch about 6 to 10 days later. Like other mammals, the mother feeds her babies with milk.

► More to explore

Echidna • Mammal

PLO

► see Palestine Liberation Organization.

Plum

Plums are small fruits that may be sweet or tart. People have eaten them since ancient times. Some grow on trees that are also valued for their beauty.

There are many varieties of plum. They grow in Europe, Asia, and North America. The leading producers of plums are China, the United States, Germany, and Romania. Most of the plums grown in the United States come from California.

Plums grow on trees and shrubs. These plants come in many sizes, shapes, and colors. Some shrubs are only 3 feet (1 meter) tall. Certain trees can be 33 feet (10 meters) high. Their leaves may be green, green with red or purple, or red-dish purple.

Most plum trees have thorny twigs. These twigs are called spurs. Groups of flowers grow on the spurs. They may be white, pink, or red. The flowers develop into the fruits, or plums.

Some plums are as small as a cherry. Others are larger than a hen's egg. Their skin may be yellow, green, red, or dark purple. Sometimes the skin has a whitish coating. At the center of the fruit is a



Plums are popular fruits that are eaten fresh or baked into pies and pastries.

hard stone, or pit. Inside the pit is a seed. Cherries, peaches, and apricots are other fruits that have pits.

Many people eat plums fresh. The fruits are also made into jams, pastries, and drinks. Some types of plums are dried to make prunes.

► More to explore

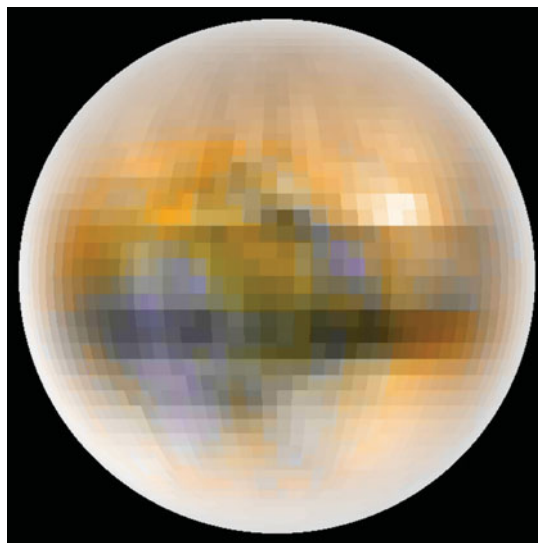
Apricot • Cherry • Peach

Pluto

Pluto was considered the smallest planet in the solar system until 2006. In that year a large group of scientists decided that Pluto was not a true planet. They voted to call Pluto a dwarf planet instead. Pluto is very far from Earth. It is difficult to observe from Earth, even with the most powerful telescopes.

Pluto orbits, or travels around, the sun at an average distance of about 3.6 billion miles (5.9 billion kilometers). It is usually farther from the sun than the planet Neptune. However, Pluto's path around the sun is shaped like an oval, not a circle. Its distance from the sun varies greatly as it orbits. About every 228 years Pluto's orbit takes it closer to the sun than Neptune. This last occurred from 1979 to 1999.

Pluto's oval orbit, small size, and other unusual features make it unlike the eight planets. In the 1990s scientists discovered a ring of millions of small, icy objects. These objects orbit the sun beyond Neptune. Pluto seems to be similar to some of them.



Pluto is very difficult to photograph clearly because it is so small and so far away.

Physical Features

Pluto's diameter, or distance through its center, is about 1,430 miles (2,300 kilometers). This is less than half the diameter of the smallest planet, Mercury.

Scientists think that Pluto consists of rocky material and frozen gases. Some areas of Pluto's surface are very bright, while others are dark. The bright regions are probably a frozen gas called nitrogen.

Pluto is so far from the sun that it receives only a little sunlight. Scientists believe that the average temperature on its surface is about -387°F (-233°C).

Orbit and Spin

Like the planets, Pluto has two types of motion: orbit and spin. Pluto completes one orbit around the sun every 248 Earth years. That means that a year on Pluto lasts 248 Earth years. Pluto spins about its center slowly. It completes one rotation in about 6.5 Earth days, so a Pluto day lasts about 6.5 Earth days.

Pluto is tilted so that it spins nearly on its side.

Moons

Pluto has three known moons: Charon, Nix, and Hydra. Pluto and Charon are closer in size than any of the planets and their moons.

Observation and Exploration

In 1930 U.S. astronomer Clyde Tom-
baugh discovered Pluto with the use of a telescope. Scientists believed that Pluto was the ninth planet in the solar system. In 2006 the United States launched a spacecraft, called New Horizons, to explore Pluto. The journey to Pluto was expected to take about nine years. Later in 2006 scientists decided that Pluto should be called a dwarf planet rather than a planet. This brought the number of planets down from nine to eight.

► More to explore

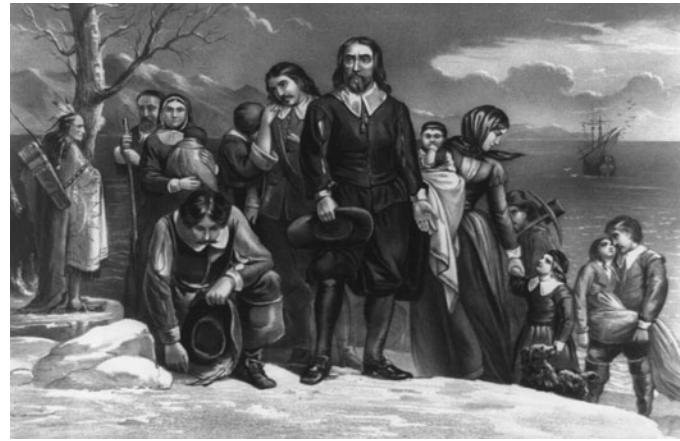
Neptune • Planets • Solar System

Pluto, god

► see Hades.

Plymouth Colony

Plymouth Colony was the first lasting English settlement in New England. It was located on the site of the modern-day city of Plymouth, Massachusetts. The city lies on Plymouth Bay, 37 miles (60 kilometers) southeast of Boston.



An old picture shows the landing of the Pilgrims at Plymouth Rock.

Plymouth was founded by people called Puritans. The Puritans were an English religious group that practiced a strict form of Protestant Christianity. They disagreed with some practices of the Church of England. Some Puritans were called Separatists because they wanted to separate themselves from the Church of England. The Separatists who left England and founded Plymouth are now known as the Pilgrims.

The Pilgrims crossed the Atlantic Ocean on a ship called the *Mayflower*. They reached Cape Cod in November 1620. It took them until December 21 to decide where to settle. They named the chosen site Plymouth because the *Mayflower's* voyage had started in Plymouth, England. According to tradition, the Pilgrims landed on Plymouth Rock on December 26.

Winter had already set in when the Pilgrims landed. They were short of food. Many became ill. More than half the Pilgrims did not survive the first winter. The Pilgrims who did survive got help

Did You Know?

Pluto is only about two-thirds as large as Earth's moon.

from Native Americans who lived nearby. The Wampanoag people taught the Pilgrims how to plant crops, fish, and hunt.

Between 1630 and 1640 the Plymouth colonists made a good living by trading with the new Massachusetts Bay Colony. In 1691 Plymouth Colony became a part of the Massachusetts Bay Colony.

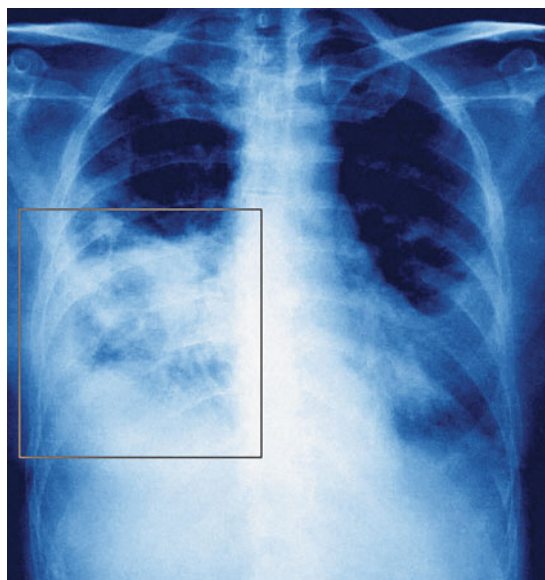
► More to explore

Colony • Massachusetts Bay Colony
• Mayflower • Puritans • Wampanoag

Pneumonia

Pneumonia is an inflammation, or swelling, of tissue in the lungs. An infection usually causes this inflammation. Pneumonia makes breathing difficult and even painful.

The main symptoms, or signs, of pneumonia are coughing, fever, chest pain, and shortness of breath. People with



Doctors find pneumonia by looking at chest X-rays. The lung at left is infected.

pneumonia may also have headaches, sweating, and confusion.

Pneumonia is not a single disease. Many things, including bacteria, viruses, and fungi, can infect the lungs and cause pneumonia. The infection can spread to others when the infected person coughs or sneezes.

Substances called vaccines can prevent some forms of pneumonia. Washing one's hands may also help to stop infections that lead to pneumonia. In addition, people should always cover their mouth when sneezing or coughing.

Treatment for pneumonia includes taking medicines that fight the infection and getting plenty of rest. Some people with pneumonia may need to go to a hospital for drugs and extra oxygen. With medical treatment, most people recover from pneumonia within a few weeks.

► More to explore

Cough • Lung • Vaccine

Pocahontas

Pocahontas may be the most famous Native American in history. She helped to make peace between Native Americans and the English colonists of Jamestown, Virginia.

Pocahontas was born in about 1595. Her father, Powhatan, was a powerful Indian leader. Pocahontas was about 12 years old when she first met the colonists. The English leader John Smith

Did You Know?

Viruses cause about half of all cases of pneumonia.



Pocahontas

later claimed that young Pocahontas saved his life. Smith said that Powhatan's men took him prisoner and were going to kill him. But Pocahontas got her father to free him.

The story has become part of American folklore, but it may not be true. Smith liked to tell tales. Nevertheless, Pocahontas was helpful. She brought food to the settlers as their supply ran low. She also warned them of possible Indian attacks.

Smith returned to England in 1609. Relations between the settlers and Powhatan grew worse. Pocahontas probably stopped visiting her English friends.

In 1613 an English sailor took Pocahontas prisoner. The sailor hoped that Powhatan would release some English prisoners in return for Pocahontas. He took Pocahontas to Jamestown. The colonists taught her Christianity. In 1614 Pocahontas married a colonist named John Rolfe. The wedding began

eight years of peace between the Native Americans and the colonists.

In 1616 the Rolfe sailed to England. The king and queen welcomed Pocahontas. But while in England Pocahontas caught the disease smallpox. She died in Gravesend, England, in March 1617.

► More to explore

Native Americans

Podgorica



Population
(2007 estimate)
174,000

Podgorica is the capital of Montenegro. The city is located in the southern part of the country, on a plain surrounded by mountains.

Although it is a very old city most of the buildings in Podgorica are less than 100 years old. Much of the city was destroyed during World War II (1939–45). Only a clocktower, a mosque, and a few houses survived. Today Podgorica is a modern city that is home to several art galleries, theaters, and museums.

Podgorica's economy is based on services such as banking, government, and telecommunications. Factories process aluminum and produce medicines.

The earliest records for the city show that the site was a caravan stop during ancient times. The city was first called Podgorica in 1326. In 1474 it became part of the Turkish Ottoman Empire. Four hundred years later Podgorica was awarded to Montenegro after a war between Turkey and several states, including Montenegro.

The city was occupied by Austria during World War I (1914–18). After the war Montenegro became part of the Kingdom of Serbs, Croats, and Slovenes. That later became Yugoslavia.

Podgorica suffered major damage during World War II. After that war the city was renamed Titograd in honor of Josip Broz Tito. Tito was the Communist leader of Yugoslavia from 1945 to 1980. After the collapse of Communism in 1992 the city once again became Podgorica. When Montenegro became an independent country in 2006 Podgorica remained its capital.

► More to explore

Montenegro • Yugoslavia

Poetry

Poetry is a type of literature, or artistic writing, that attempts to stir a reader's imagination or emotions. The poet does this by carefully choosing and arranging language for its meaning, sound, and rhythm. Poetry has many forms and styles. Poems may tell a story or express feelings. They may be serious or funny.

One thing that makes poems different from other types of writing is their structure. The words of a poem are arranged in lines and groups of lines, called stanzas. For example, here is the first stanza of the poem “From a Railway Carriage,” about an exciting train ride, by Robert Louis Stevenson:

Faster than fairies, faster than witches,
Bridges and houses, hedges and
ditches;
And charging along like troops in a
battle,
All through the meadows the horses
and cattle:
All of the sights of the hill and the
plain
Fly as thick as driving rain;
And ever again, in the wink of an eye
Painted stations whistle by.

Rhythm

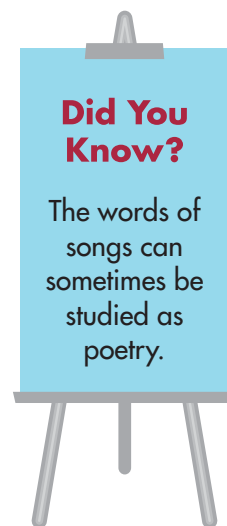
Poets use patterns of rhythm to create various effects. Some syllables, or parts of words, in a line receive more emphasis, or stress, than others. For example, in the phrase “hedges and ditches,” the “hedg” and “ditch” sounds are stressed more than the other sounds. The stressing of certain syllables creates a rhythm. A poem's rhythm is called its meter.

Sound

Poets also use patterns of sound. Some poems rhyme, or use two or more words that end with the same sound, such as “hat” and “bat.” A poem may repeat sounds in many other ways. For example, in “high as a kite,” the long “i” sound is repeated. In “a stroke of luck,” the “k” sound is repeated. A group of

Did You Know?

The words of songs can sometimes be studied as poetry.



words can also start with the same sound, as in “a dark and dangerous day.”

Form

Some poems follow strict patterns of meter, sound, and length. For instance, the sonnet is a form of poetry that consists of 14 lines of 10 syllables each. It also follows a set pattern of rhythm and rhyme. Haiku is a form of poetry with three lines. Each line has a fixed number of syllables: five syllables in the first and third lines and seven syllables in the second line.

Some poems do not use any set form. Instead they use rhythms that are closer to those of everyday speech. These poems are known as free verse. However, the poet may still carefully arrange the sounds and rhythm.

► More to explore

Literature • Nursery Rhyme • Writing

Poison

A poison is a substance that causes harm when it enters the body or touches the skin. Certain household cleaners are poisons. Parts of certain plants are poisons. The venoms in certain snakes, spiders, insects, fish, and other animals are poisons. Foods that have spoiled also may have poisons in them.

Some poisons, such as the oil on the leaves of poison ivy, cause rashes or pain. Other poisons, such as those in certain molds and mushrooms, cause serious illness or death.



The skull-and-crossbones symbol is often used as a warning that something is poisonous.

Some poisons can harm people in seconds. Others can build up over days, weeks, or months and then harm people. For example, a person feels the sting of a poisonous scorpion right away. But if a person regularly breathes in paint dust that has lead in it, the lead will gradually build up in the body. The damage will happen slowly.

A person who thinks someone has been poisoned should immediately telephone a poison control center or emergency call center. The person should be ready to explain what happened and wait for instructions. Doctors can treat many types of poisoning.

Still, people should learn to identify poisons in order to prevent poisoning. It is especially important to keep medicines, household cleaners, and other poisonous substances out of the reach of children.

► More to explore

Food Poisoning

Poland

The Republic of Poland is a country in eastern Europe. The outline of Poland often changed during its history. At times it did not exist at all when foreign powers took control of the land. In the late 20th century Poland led the fight against Communism, a strict form of government, in eastern Europe. Poland's capital is Warsaw.

Geography

Poland borders Germany, the Czech Republic, Slovakia, Ukraine, Belarus, Lithuania, and Russia. The Baltic Sea lies to the north.

Most of Poland is low and flat. Hills and mountains rise in the south. The Tatra Mountains, on the border with Slovakia, are the highest range. Poland's main rivers are the Vistula and the Oder. Both flow northward into the Baltic Sea.

Poland has warm summers and cold, snowy winters. The mountains get the most rain and snow.

Plants and Animals

Forests cover about one quarter of the country. Larch, beech, oak, birch, pine, and spruce are common trees. The animals of the forests include deer, wild pigs, beavers, and elk. Bears, wildcats, and chamois (goatlike animals) roam the mountains. Small numbers of wisent, or European bison, live in the east.

People

Most of Poland's people are Poles. They speak Polish, a language related to Czech and Slovak. Small numbers of Ukrainians, Germans, and Belarusians also live in the country. The main religion is Roman Catholicism. More than half of the population lives in cities and towns.

Economy

Services such as banking, communications, and tourism are the fastest-growing parts of Poland's economy. Manufacturing is also important. Factories make food products, machinery, transportation equipment, iron and steel, and chemicals. The country also mines coal, sulfur, copper, and silver.

Agriculture is a small part of the economy, but many Poles still work as farmers. The main crops include pota-





Children wear traditional clothing at a ceremony in Poland.

toes, wheat, and sugar beets. Farmers produce pork, eggs, and dairy products as well.

History

People called Slavs came to what is now Poland more than 3,000 years ago. The written history of Poland begins in the AD 900s. At that time the Piast dynasty (ruling family) gained power in the region. The Piast ruler adopted Christianity in 966.

The Piast dynasty ruled Poland until the 1300s. In 1386 Poland's Queen Jadwiga married Wladyslaw II Jagiello, the grand duke of Lithuania. The marriage united Poland and Lithuania, which were known together as the Commonwealth. The marriage also started the Jagiellon dynasty. The Jagiellon rulers controlled Hungary and Bohemia (now part of the Czech Republic). They fought off powerful enemies.

Weakened Poland

After the Jagiellon dynasty ended in 1572, weak kings ruled the Common-

wealth. In the 1600s the Commonwealth fought costly wars with Sweden, Russia, and Turkey.

In 1772 Russia, Prussia (part of Germany), and Austria each took part of the Commonwealth's territory. The three powers divided the land again in 1793. After a third division in 1795, Poland no longer existed as a separate state.

The Poles formed a new Polish kingdom in 1815, but the Russians controlled it. The Poles revolted against Russian rule several times. Russia responded by stamping out Polish culture. For example, Russia ordered that Polish schools use the Russian language.

Rebirth of Poland

World War I (1914–18) led to the rebirth of Poland. The war weakened



Tourists visit an old monastery of the Roman Catholic church in Poland. A monastery is a home for monks.

Facts About POLAND



Population
(2008 estimate)
38,111,000

Area
120,728 sq mi
(312,685 sq km)

Capital
Warsaw

Form of government
Republic

Major cities
Warsaw, Łódź,
Kraków,
Wrocław, Poznań



TIMELINE

Poland adopts Christianity.		Russia, Austria, and Prussia take Poland's land; Poland ceases to exist.		Germany invades Poland.		Poland's Communist government falls.
966	1386	1772–95	1918	1939	1945	1989
	Poland and Lithuania unite.		Poland is reborn as an independent republic.		Poland becomes a Communist country.	

Russia, Austria, and Germany. Poland became an independent republic in 1918.

World War II

Germany and Russia (by then part of the Soviet Union) still wanted parts of Poland's land. In 1939 the two countries secretly agreed to divide Poland between them. In September 1939 Germany invaded western Poland. The invasion started World War II. Soon the Soviet Union took over the east.

In 1941 Germany turned against the Soviet Union and took over all of Poland. The Nazis of Germany killed about 3 million Polish Jews. This was part of a massacre called the Holocaust.

Communism

The Soviet Union drove the German army out of Poland in 1945. After the war Poland lost its eastern lands to the Soviet Union. However, it gained Ger-

man lands in the west. Meanwhile, the Soviet Union set up a Communist government in Poland. Secret police arrested and sometimes killed people who disagreed with the government.

In 1980 an electrician named Lech Walesa helped bring together almost 10 million Polish workers into an organization called Solidarity. It protested the Communist government. In 1981 the government made the group illegal.

Modern Poland

After more protests the government made Solidarity legal in 1989.

Communism soon collapsed. In 1990 Poland elected Walesa president. He and later leaders worked to improve the economy. Poland joined the European Union in 2004.

► More to explore

Communism • European Union
• Holocaust • Lithuania • Warsaw
• World War II

Did You Know?

On May 1, 1986, members of the Steger International North Pole Expedition reached the North Pole assisted only by dogs.

Polar Exploration

Polar exploration is the exploration of the lands around the North and South poles. The poles are the coldest and most remote regions on Earth. The North Pole is in the Arctic Ocean, which is covered by a huge, floating ice sheet. The South Pole is on land, in the frozen continent of Antarctica.

Some early polar explorers used dogsleds or went on foot. This was dangerous, as huge cracks in the ice could swallow dogs, sleds, and people. Other explorers used ships. This also was dangerous, as floating ice could wreck the ships. Later explorers used icebreakers (ships that can cut through ice), dirigibles (aircraft that float like balloons), airplanes, and snowmobiles.

Reasons for Polar Exploration

People made early polar explorations for a number of reasons. Some people wanted the fame that would come from being the first to reach an unknown land. Others were hoping to discover shorter sailing routes from Europe to eastern Asia. Still others sought to get rich from whale and seal hunting. More recently, people began exploring the polar regions to gather scientific information. Many adventurous explorers died or risked their lives trying to achieve these goals.

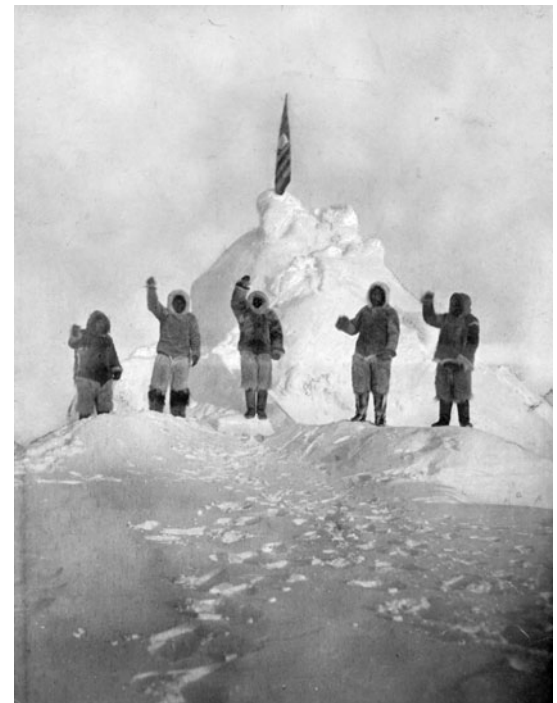
Exploring the Arctic

Native peoples have lived in the regions around the Arctic Ocean for thousands of years. The first outsider to reach the

Arctic was probably an ancient Greek named Pytheas. He reached Norway or Iceland in about 300 BC. The Vikings of Norway traveled to Iceland and Greenland in the 800s and 900s.

By the 1500s the Dutch and the English were venturing to the Arctic in search of trade routes. In 1878–79 a Swedish explorer, Baron Adolf Erik Norden-skiöld, sailed from Europe through the Arctic Ocean to the Pacific Ocean. This route was called the Northeast Passage. In 1905 the Norwegian explorer Roald Amundsen became the first to sail through the Northwest Passage. This was a route through the Arctic from the Atlantic Ocean to the Pacific Ocean.

The U.S. explorer Robert E. Peary claimed to be the first person to reach the North Pole, in 1909. Peary, Mat-



Matthew Henson (center) waves from the North Pole in 1909. With him stand other members of the group led by Robert E. Peary.

threw Henson, and four Eskimo (Inuit) made the last part of the trip on dogsleds. Some people later questioned whether Peary really did reach the pole.

In 1926 Amundsen and two companions flew over the North Pole in a dirigible. In 1937 pilots from the Soviet Union flew an airplane to the United States over the North Pole. In 1958 a U.S. submarine became the first ship to cross the North Pole under the Arctic ice sheet.

Exploring Antarctica

Several explorers first saw Antarctica in 1820. People first landed on the continent in 1895. British explorers Robert F. Scott and Ernest Henry Shackleton each led expeditions there in the early 1900s.

Scott reached the South Pole on January 18, 1912. He had hoped to be the first to do so. However, Roald Amundsen and four companions had reached the pole a month earlier, on December 14, 1911. Scott and his men died on their return trip.

In 1928 the U.S. explorer Richard E. Byrd set up a base on an ice shelf on Antarctica's coast. Byrd made the first flight over the South Pole in 1929.

Meanwhile, many countries were becoming interested in the scientific study of Antarctica. During 1957–58 scientists from several countries set up 50 bases throughout Antarctica for scientific research. In 1959 a number of countries signed the Antarctic Treaty.



Ross Island is in the Ross Sea, just off the coast of Antarctica. Several explorers have used the island as a base.

This agreement preserves the entire Antarctic continent for scientific research.

► More to explore

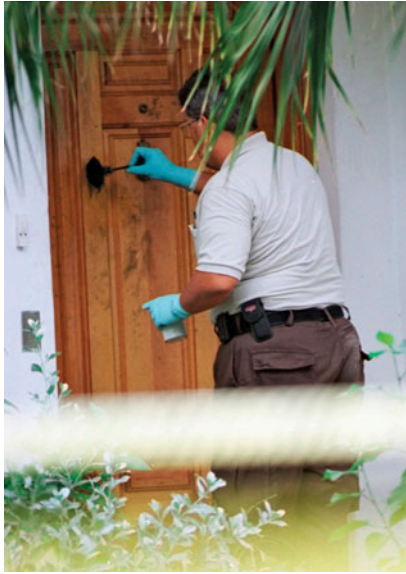
Amundsen, Roald • Antarctica • Arctic Ocean • Eskimo • Henson, Matthew • Peary, Robert E.

Police

The police are people whose job is to make sure that citizens follow the law and do not harm others. Police officers work for the governments of towns, cities, counties, states, and countries.

Police Today

The police have many tasks. First, they patrol, or keep watch over, streets and neighborhoods. Most police officers patrol in cars. But sometimes they patrol on foot, on horseback, on motorcycles, or on bicycles. Second, police go to the scenes of crimes and emergencies to catch criminals and to help victims. Third, police investigate, or study, crimes to find out who committed



A police officer at a crime scene brushes powder on a door in the hope of finding fingerprints. Police use fingerprints to identify criminals.

them. Police fight many types of crimes. One of the most serious is terrorism. (Terrorists use violence to try to affect people's beliefs or ways of life.)

Some police officers wear uniforms. Others work in everyday clothing, called plain clothes. Many police officers carry handcuffs, a notebook, and a two-way radio. Some also carry a handgun. Some use a stun gun or pepper spray to stop criminals without seriously harming them. Some officers travel with specially trained police dogs.

Police officers whose main job is investigating crimes are called detectives. Detectives usually work in plain clothes. They talk to witnesses, or people who may know something about the crimes. They also talk to suspects, or people they think may be guilty of the crimes.

Detectives sometimes use hidden microphones or cameras to record the conversations and actions of suspects.

At the scene of a crime, detectives look for evidence, or clues to help them figure out who committed the crime. Evidence includes fingerprints, footprints, bits of cloth, blood, hair, and anything else that the criminal may have left behind. When they find the person who they think committed the crime, they arrest that person. The person may then be put on trial to determine if they did commit the crime. During the trial, the detectives and other police officers often talk about the evidence they gathered when they were investigating the crime.

History

Ancient peoples, including the Sumerians, the Egyptians, and the Babylonians, had police forces. Their job was mostly to make sure that the people followed the rulers' orders. Emperor Augustus of Rome put together a large and well-organized police force in 7 BC.



Police officers block off a street in London, England, while they investigate terrorist attacks.

Over the centuries other cities and countries set up police forces.

By the 1800s police were using many modern tools and methods to do their jobs. Police first used telephones in Washington, D.C., in 1878. Finger-printing was introduced in the 1890s. Police first rode in cars in the United States in 1899. In the 1920s police started using ballistics—the study of bullets to match them to the gun that fired them. In the 1930s police began using small two-way radios to communicate with each other. Today police depend on computers to keep records and to search for information while solving crimes.

► More to explore

Crime • Government • Law

Polio

Polio, called poliomyelitis in full, is a disease caused by a tiny germ called a virus. In the past, polio attacked many children and left them paralyzed, or unable to move their muscles.

The first symptoms, or signs, of polio can be very mild. In fact, many people who get the disease feel fine. Others think they have caught a cold. In serious cases people complain of having pains in their neck, back, and legs. The pains are a sign that the polio virus has attacked the spine. The spine has nerves that control the muscles of the body. If the virus damages those nerves, the muscles become weak.



A child wears a brace on a leg that has been affected by polio.

Some people recover their muscle strength. Others become permanently paralyzed. If the virus damages the nerves controlling the leg muscles, the person can no longer walk. If the virus attacks the nerves controlling the lungs, the person cannot breathe without the help of a machine. There is no cure for polio.

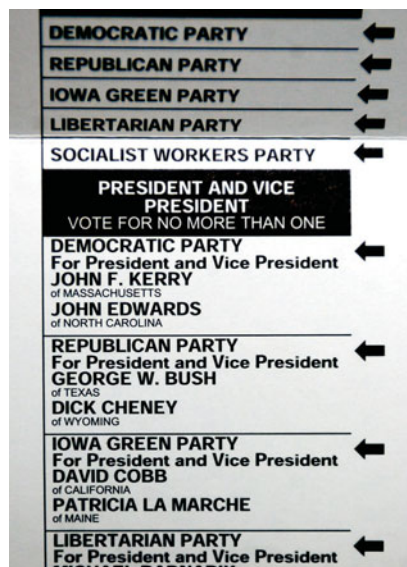
As recently as the 1950s polio affected thousands of people in the United States. Polio affected mostly children, but some adults got it as well. The U.S. president Franklin D. Roosevelt was paralyzed by polio as an adult.

In the early 1950s the medical researcher Jonas Salk made a substance called a vaccine to protect people from the virus that causes polio. Polio has disappeared from most countries because almost every child is vaccinated.

► More to explore

Disease, Human • Salk, Jonas • Virus

Political Party



A portion of a ballot from a U.S. presidential election shows candidates from large and small political parties.

Political parties are groups of people that work to be in charge of a government. The main way in which a political party gains power is through the election of its members to office. “Office” is a word for a government position—for example, the presidency or a seat in a legislature (lawmaking body). In many countries the party with the most members in the legislature has great control over the government.

Government leaders are the most powerful members of political parties. But ordinary voters may belong to political parties, too. Party members usually have similar beliefs about the role of government and how it should be run.

The number of political parties differs from country to country. Some countries have several parties, and all of them

may be represented in the government. Many European countries have three or more major political parties.

Other countries function with only two major parties. In the United States the two main political parties are the Democratic Party and the Republican Party. Other parties, called third parties, may exist in such a system. However, most people support either of the two main parties. It is almost impossible for third parties to gain power.

Still other countries have one-party systems. China, Cuba, and several African countries have such systems. There all members of the government must belong to the same party. People might form opposing parties, but their candidates may not run for office. Opposing parties may even be illegal. Such groups are sometimes called underground political parties.

► More to explore

Government • Legislature • Voting

Polk, James K.

James K. Polk was the 11th U.S. president. During his term the United States won a war with Mexico and gained much land along the Pacific coast and in the Southwest.

Early Life

James Knox Polk was born on November 2, 1795, in Mecklenburg County, North Carolina. He was the eldest child of Samuel and Jane Knox Polk. At age 11 he moved with his

Did You Know?

In the United States, the Republican Party's symbol is an elephant. The Democratic Party's symbol is a donkey.



James K. Polk was the 11th president of the United States.

family to Tennessee. He graduated in 1818 from the University of North Carolina.

Polk then returned to Tennessee and studied law. In 1820 he started a law practice in Columbia, Tennessee. Four

years later he married Sarah Childress. They had no children.

Political Career

A Democrat, Polk was elected to the Tennessee legislature in 1823. A year later he was elected to the U.S. House of Representatives. He served there for 14 years, including four years as speaker (leader) of the House. In 1839 Polk was elected governor of Tennessee. He failed to win reelection in 1841 and again in 1843.

Presidency

The Democrats planned to choose Polk to run for vice president in 1844. A dispute over the presidential candidate, however, led the Democrats to ask Polk to run for president instead. In the election Polk defeated Henry Clay of the Whig Party.

As president, Polk settled a fight over the Oregon Territory. The United States and Great Britain both claimed the land.



TIMELINE

Polk is born in Mecklenburg County, North Carolina.

November 2, 1795

Polk becomes governor of Tennessee.

1839

Polk settles the Oregon dispute.

1846

Polk dies in Nashville, Tennessee.

June 15, 1849

Polk is elected to the U.S. House of Representatives.

Polk is elected president.

The Mexican War ends; the United States gains land.

Did You Know?

Polk was 49 years old when he became president. He was the youngest U.S. president up to that time.

Polk proposed dividing the territory at the line of 49° north latitude (the 49th parallel). After refusing, Britain finally accepted Polk's offer. In 1846 the United States received the part of Oregon south of the 49th parallel.

Polk also gained Texas and much of the Southwest for the United States. In 1845 the United States admitted Texas, formerly part of Mexico, as a state. That action caused the Mexican War of 1846–48. After the United States defeated Mexico, it bought more Mexican land. That territory included parts of what are now Arizona, California, Colorado, Nevada, New Mexico, and Utah.

Retirement

At the end of his term in 1849, Polk retired to his home in Nashville, Tennessee. He died soon afterward, on June 15, 1849.

► More to explore

Mexican War • Oregon • United States

Pollen

Pollen is the substance that causes plants to form seeds. New plants then can grow from the seeds. Both flowering plants and conifers (plants that grow seeds inside cones) make pollen. A grain of pollen is so tiny that it is best viewed through a microscope.

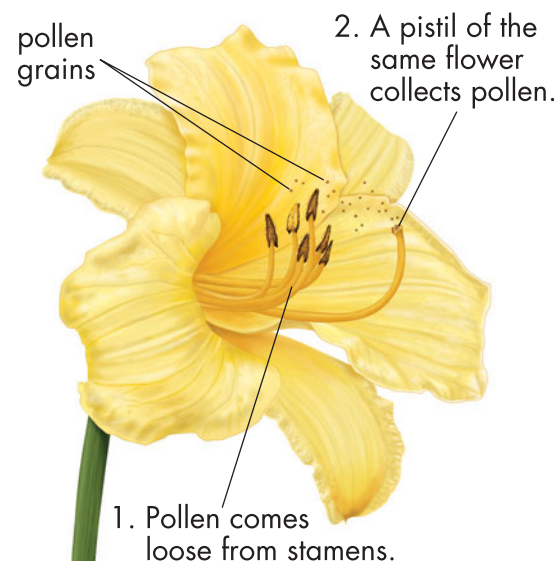
Pollination

The male parts of a plant, called stamens, make pollen grains. These grains

contain sperm cells. The female parts of a plant, called pistils, contain egg cells. During pollination, pollen grains travel from the male parts to the female parts. There, a sperm cell from the pollen joins with an egg cell. The fertilized cell then develops into a seed.

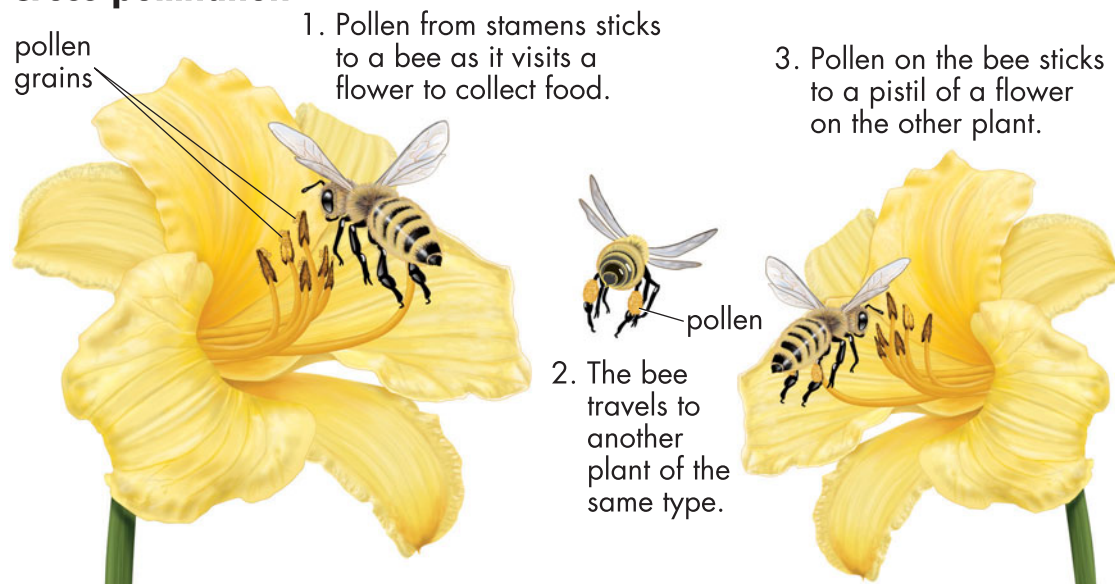
Some plants have only male or only female parts. They need help transporting pollen between plants. This is called cross-pollination. Other plants have both male and female parts. They can pollinate themselves. This is called self-pollination.

Pollen travels in many ways. Wind, water, and animals can carry it. Many plants have fragrant or colorful flowers to attract birds or insects (especially bees). These animals come to drink a sweet liquid called nectar. While an animal drinks the nectar, pollen from the flower sticks to its body. The animal

Self-pollination

A plant can pollinate itself if it has both stamens and pistils.

Cross-pollination



Most plants depend on a carrier, such as a bee, to bring pollen to them from another plant.

carries the pollen to other flowers when it moves on for more food.

Hay Fever

Some people have an allergic reaction when they breathe in pollen. They may sneeze, get a stuffy nose, or have itchy eyes. This condition is known as hay fever. People with hay fever suffer most during seasons when there is a lot of pollen in the air.

► More to explore

Allergy • Conifer • Flower • Plant • Seed

Pollution

Pollution happens when the environment is contaminated, or dirtied, by waste, chemicals, and other harmful substances. Pollution is a problem all over the world. But it is especially bad in large cities with a lot of industries and automobiles. There are three main forms of pollution: air, water, and land.

Air Pollution

Wildfires, volcanoes, and industrial chemicals cause some air pollution. But most air pollution comes from burning fossil fuels. These include coal, oil, and natural gas. Factories, electrical plants, and automobiles burn these fuels for power. The burning of fossil fuels may release solid particles, such as ash and soot, into the air. It also may release harmful gases. This type of pollution may be seen in the form of smog over



The smokestacks of chemical plants send pollution into the air.



Workers clean a seacoast that is coated with oil spilled by a tanker ship.

big cities. The word smog is a combination of “smoke” and “fog.” Smog-filled air is hazy, or hard to see through.

Air pollution may cause such diseases as cancer and asthma. Air pollution also leads to acid rain, or polluted rain that can harm living things. In addition, air pollution may be a cause of global warming, which is a steady rise in Earth’s average temperature. Finally, air pollution damages a part of the atmosphere called the ozone layer. The ozone layer is important because it protects Earth against harmful rays from the sun.

Water Pollution

Some causes of water pollution are easy to see. People dump garbage and sewage into creeks, rivers, ponds, lakes, and oceans. Factories or cities sometimes release oils, poisonous chemicals, and other wastes into water.

Other causes of water pollution are not so direct. The use of chemicals in farming is one example. Farmers use some

chemicals as fertilizers, or substances added to soil to help crops grow. They use other chemicals as pesticides or herbicides. These are substances that kill pests or weeds. When these chemicals seep into the ground, they may make the groundwater unfit to drink. Chemicals also may drain into rivers and lakes, where they can harm fish and other forms of life.

Land Pollution

Littering, or tossing garbage on the ground, is a form of land pollution. Litter is unpleasant to look at. It also can destroy the habitats, or homes, of plants and animals.

The buildup of dangerous chemicals in the ground is another form of land pollution. The chemicals may come from farms or factories. These chemicals can spread to plants and animals. They may even harm people who eat the contaminated plants and animals.

Controlling Pollution

Many governments, environmental groups, and ordinary people are working to control pollution. Governments have passed laws to keep people from releasing dangerous chemicals into the environment. Some companies and people are trying to use fewer fossil fuels.

Instead they are getting power from the sun, wind, water, and other energy sources that produce less pollution.

Many communities use recycling to reduce pollution. Recycling is the process of making new products out of used

paper, plastic, glass, aluminum, or other materials.

► More to explore

Acid Rain • Environment • Fossil Fuel
• Global Warming • Recycling

Polo, Marco

During the Middle Ages the Italian merchant Marco Polo spent many years in China. He wrote a famous book about his experiences. The book helped Europeans to learn about Asian peoples and goods.

Marco Polo was born in about 1254, probably in Venice (now in Italy). His father and uncle were merchants who traveled to many lands. In 1271 they took young Marco to Asia. The Polos sailed over the Mediterranean Sea to what is now Israel. Then they traveled overland through Turkey, Persia (now Iran), and Afghanistan. In central Asia

they followed a trail called the Silk Road. The Silk Road was a trade route for fine silk cloth from China.

In 1275 the Polos reached Shangdu, in Mongolia. This was the summer home of Kublai Khan, the Mongol emperor of China. For about 17 years Marco Polo worked for the emperor. His errands took him all the way to southwestern China and probably to Burma (now Myanmar).

For their return trip to Venice, the Polos took 14 of Kublai Khan's ships. They sailed from eastern China to the coast of Persia. Then they went overland through Persia and Turkey. They finally reached Venice in 1295. Everyone was amazed to see them alive after so many years.

Marco Polo soon went back to sea. Forces from the trading city of Genoa, a rival of Venice, captured his ship. They put Polo in prison. There he met a



Marco Polo traveled thousands of miles from Venice to China and back again.

writer who helped him to describe his travels in a book. Polo was released from prison in 1299. He returned to Venice, where he died on January 8, 1324.

► More to explore

China • Mongol Empire • Venice

Pomo



An old photograph shows a Pomo woman gathering seeds into a basket.

The Pomo are Native Americans of northern California. There are about 72 separate tribes grouped together as Pomo.

Pomo along the coast of the Pacific Ocean traditionally lived in cone-shaped homes made from the wood and bark of redwood trees. The Pomo farther inland lived in larger rectangular houses built from poles, brush, and grass. The Pomo fished and hunted deer, birds, and small animals. They also gathered and ate many types of wild plants.

Spanish explorers may have visited the Pomo in 1542. In 1811 or 1812 Russian fur traders founded Fort Ross in Pomo territory. The Russians forced the Pomo to hunt sea animals and give them the animals' furs.

A few years later Spanish priests built a mission in the area. They got some Pomo to live and work at the mission. The Spanish often treated the Pomo harshly. In addition, many Pomo died from smallpox and other diseases brought by the Spanish.

Gold was discovered in California in 1848. Thousands of U.S. settlers rushed to the area, taking Pomo lands. The settlers killed many Pomo. They forced other Pomo to work in mines as slaves. At the end of the 20th century there were about 5,000 Pomo living in the United States.

► More to explore

Missions, Spanish • Native Americans

Pompeii

Pompeii was an ancient city in southern Italy. In AD 79 a volcano called Mount Vesuvius erupted close by. Thousands of people died, and the city was buried. Archaeologists later cleared away much of the rubble. They uncovered ruins that gave historians a look at life in the Roman Empire.

The Ancient City

People lived in the Pompeii region in prehistoric times. The Romans took control of Pompeii in about 290 BC.



Many of the buildings that were excavated in Pompeii are now open to the public. On display in one room is a plaster cast of one of the people who died in the city. The people who excavated Pompeii discovered that the ashes that covered the city made molds of some of the people who died there. Scientists later made models from those molds.

They brought Roman architecture and culture to the city.

Mount Vesuvius began to erupt on August 24, AD 79. The eruption lasted for several days. Poison gases from Vesuvius choked many people. Then volcanic stones and ashes covered the city. When the eruption ended, Pompeii was buried to a depth of 19 to 23 feet (6 to 7 meters).

The Archaeological Site

The debris protected Pompeii from vandals and the weather for hundreds of years. An Italian architect discovered the ruins in the late 1500s. Archaeologists began excavating, or digging out, the city in 1748. The work at Pompeii and Herculaneum, another city buried by Vesuvius, marked the start of modern archaeology.

The early excavations were not well organized. Many early diggers were interested only in finding treasure. After 1860, however, archaeologists made sure that the work was done in an orderly way. By the 1990s about two thirds of the city had been excavated.

Historians have learned a lot about the Roman world from the excavations. They can walk down streets and look at temples, public baths, houses, and shops. The digging uncovered charred nuts and fruits in market stalls and loaves of bread in bakeries. Historians have also learned about life in Pompeii from statues and pictures.

► More to explore

Archaeology • Rome, Ancient
• Vesuvius, Mount

Did You Know?

The ancient city of Stabiae was also destroyed by the eruption of Mount Vesuvius.

Ponca

The Ponca are Native Americans of Oklahoma and Nebraska. They once lived along the coast of the Atlantic Ocean, but they later moved west.

The Ponca lived in earth-covered lodges. They fished, hunted, and gathered wild plants for food. In spring and autumn they lived in portable tepees while hunting bison (buffalo).

By the late 1600s the Ponca were living in what is now Minnesota. Warfare with the Sioux people forced the Ponca to move even farther west. They settled in southwestern Minnesota and the Black Hills of South Dakota.



Standing Bear was a Ponca chief. In 1879 he went to court to challenge the U.S. government's treatment of his people. The court ruled in his favor. The case was very important to the cause of Native American rights.

By the early 1800s diseases brought by white settlers had reduced the tribe from about 800 people to about 200. In 1877 the U.S. government forced the Ponca to move to Indian Territory (now Oklahoma). Some Ponca left Indian Territory and traveled north on foot for 600 miles (965 kilometers) to eastern Nebraska. The Ponca who settled in Nebraska became known as the Northern Ponca. The Ponca who stayed in Indian Territory became known as the Southern Ponca. By the late 20th century the number of Ponca had grown to more than 3,000.

► More to explore

Kaw • Native Americans • Omaha
• Osage • Quapaw

Ponce de León, Juan

Juan Ponce de León was an early Spanish explorer of the Americas. He was the first European to visit Florida. He is also famous for his search for the legendary Fountain of Youth.

Ponce de León was born in 1460 in the Spanish province of León. He may have sailed to the Americas with Christopher Columbus in 1493. In 1502 he helped to conquer the island of Hispaniola, in the Caribbean Sea. In 1508 he founded Puerto Rico's earliest European settlement. In 1509 he became governor of the island.

While in Puerto Rico, Ponce de León heard about an island where a spring flowed with water that kept people young. In March 1513 he went looking



Juan Ponce de León

for the island. He landed on the mainland of North America, though he thought he was on an island. He named the territory Florida.

Ponce de León had landed near what is now Saint Augustine, in the northeastern part of the state. He did not find the fountain so from there he traveled south along the coast. He continued through the chain of islands called the Florida Keys to Florida's west coast. On the way he discovered the Gulf Stream, a warm ocean current that flows northward.

Ponce de León returned to Spain in 1514. The king gave him permission to start colonies in the areas he had visited. In 1521 Ponce de León sailed again to Florida. He was wounded in an attack by Native Americans. His crew took him to Havana, Cuba, where he died.

► More to explore

Americas, Exploration and Settlement of the • Florida • Puerto Rico

Pontiac

Pontiac was a Native American chief of the Ottawa people. He is best known for leading a war to stop the British from taking control of the Great Lakes area. The war is now called Pontiac's War.

Pontiac was born in about 1720 in what is now Ohio. Little is known of his early life. By 1755 he had become a chief.

At first Pontiac was friendly to British settlers. But he soon realized that they were trying to take control of his peo-



Pontiac

ple's land. In 1762 he asked other Native American tribes in the region to help stop the British. He planned surprise attacks on British forts. In 1763 Pontiac himself tried to capture a fort on the site of Detroit, Michigan. He was defeated after five months of fighting.

In all, Pontiac's forces attacked 12 forts and captured 8 of them. They also destroyed many British settlements. After a few years of war Pontiac grew tired. He agreed to a peace treaty with the British in 1766. On April 20, 1769, Pontiac was killed by a Peoria Indian in what is now Cahokia, Illinois.

► More to explore

Native Americans • Ottawa

Pony Express

The Pony Express was a service that delivered mail on horseback between Missouri and California. The service

lasted for only about a year and a half in the early 1860s. Nevertheless, the Pony Express is well remembered in the stories of the American West.

Starting in the 1840s many people moved to the western United States. Mail from the East took a long time to reach the Westerners. It took about a month for a letter to travel from New York to California by sea. A stagecoach service from Saint Louis, Missouri, to San Francisco, California, took 24 days.

A company called Russell, Majors, and Waddell decided to set up a horseback mail service from Saint Joseph, Missouri, to Sacramento, California. The route was about 1,800 miles (2,900 kilometers) long. Along the way there were

157 stations—one about every 10 to 15 miles (16 to 24 kilometers).

A rider carried about 15 pounds (7 kilograms) of letters in a pouch. He changed horses at every station. After 6 to 8 stations a new rider took over. Only the pouch of mail traveled the entire distance. This usually took about 10 days.

The first mail pouch left Saint Joseph on April 3, 1860, and arrived in Sacramento on April 13. The service was closed down after a telegraph system was completed in October 1861. The Pony Express lost only one load of mail, even though the riders faced outlaws, unfriendly Native Americans, and rough country. The most famous Pony Express



The Pony Express crossed the Rocky Mountains and the Sierra Nevada on the route between Missouri and California.

rider was William Cody, who later became known as Buffalo Bill.

► More to explore

Cody, William Frederick • Postal Service
• Telegraph

Pope

The pope is the head of the Roman Catholic church. The office or institution associated with the pope is called the papacy. The pope rules the church much as a king rules a country.

Duties

The pope does many things. He has an organization called the Roman Curia to help him. The pope decides the church's position on issues. He makes church laws. He has the power to call ecumenical councils, which are general meetings that decide church policy. The pope also appoints clergymen called bishops and assigns them to regions called dioceses. A bishop is in charge of all the Catholic churches within his diocese.

The pope himself is the bishop of Rome, Italy. He rules Vatican City, which lies within Rome's borders but is a separate country. Vatican City is all that remains of the Papal States, a region of Italy that the popes ruled from 756 to 1870.

Elections

The pope is elected to his position. Only the highest-ranking bishops, who are called cardinals, have votes. After a pope dies, all the cardinals under age 80 gather in a building called the Sistine



The pope blesses a gathering of people in Vatican City.

Chapel. There they secretly vote for a new pope. White smoke from the chapel chimney is the signal that a new pope has been elected.

History

Catholics consider Saint Peter, who died in about AD 64, to be the first pope. Peter was one of the 12 disciples, or first followers, of Jesus Christ. Since then there have been more than 260 popes.

During the Middle Ages, which lasted from about AD 500 to about 1500, unhappy cardinals sometimes chose their own popes. These unofficial popes are now known as antipopes. Beginning in 1378, during a period called the Great Western Schism, there were popes in Avignon, France, and in Rome. By 1417, however, the cardinals had agreed on one pope. Since then, every pope has lived in Rome.

► More to explore

Roman Catholicism • Vatican City

Poplar



Some kinds of poplar grow tall and narrow.

Poplars are fast-growing trees. People like them for their beauty and the shade they provide. Aspens and cottonwoods are types of poplar. Poplars are closely related to willows.

Poplars grow in many parts of North America, Europe, Asia, and North Africa. Many grow in moist, wooded areas or near water. Poplars come in many shapes and sizes. At up to 200 feet (60 meters), the Western balsam poplar is one of North America's tallest trees. Other types grow only to about 100 feet (30 meters).

Flowers appear on all poplars. The flowers develop pods filled with tiny seeds. These pods will open and the fluffy seeds will float to the ground. Poplar leaves are oval, heart-shaped, or round. The top of the leaf is light or dark green. The underside is fuzzy and either a lighter green or silvery color. Poplar leaves flutter in the gentlest breeze.

Poplars have soft wood that is used to make furniture, particle board, and

paper. Although it is useful in some ways, the poplar tree can also cause problems. The roots are always looking for water. If poplars are planted too close to water pipes or sewer lines, their roots will clog them. In addition, poplars have more insect damage, disease, and rotting than many other trees.

► More to explore

Aspen • Tree • Willow

Poppy

Poppies are flowers that are valued for their brilliantly colored blossoms with papery petals. They are grown as garden plants and also for their seeds.

Poppies grow in mild climates throughout the world. Most species, or types, of poppy grow best in sunny areas with moist soil. Some, however, can grow in rocky deserts.



California poppies grow wild in a meadow.

Poppies come in different sizes. Some are tiny plants that grow near the soil. Others grow to more than 15 feet (4.6 meters) in height. The leaves may be green or bluish green. Some leaves, stems, and the pods that hold the seeds are hairy.

Poppy flowers are shaped like cups and have four to six petals. They may be red, orange, yellow, pink, blue, lilac, or white. Some species have a dark blotch at the center of the flower. Poppies do not give off a strong smell.

Most types of poppies have only one flower on each stem. The flowers close at night and open in the morning. When the soil is dry, the seed pod opens and many small seeds fall to the ground.

One type of poppy produces seeds that have a nutty taste when dried. The seeds are used for baking breads and desserts. In addition, medicine to relieve pain can be made from the same poppy.

Popular Music

Popular music is any type of music that a large number of people enjoy. Popular music, also called pop, is usually top-selling music created by professional musicians.

Popular music is different from folk music. Folk music is the traditional music and songs of common people. Popular music is also different from classical music, which is often more formal or artistic.



A popular music act draws a large crowd at an outdoor concert in Australia.

Types of Popular Music

There are many types of popular music. Some of the best-known types are rock, country, rap, rhythm and blues (or R&B), dance music, the blues, jazz, and reggae. People throughout the world listen to these forms of popular music.

Other popular music is known mainly in a certain country or region. Often this kind of popular music is based on the traditional music of the area. If this type of music gains popularity around the world, people call it world music.

It is very common for popular music to be popular for only a short time. New songs regularly replace hit songs. Even types of popular music lose popularity. The styles of ragtime, vaudeville, big band, soul, funk, and disco are no longer as popular as they once were. However, some songs and styles have remained popular for many years.

History

Popular music developed out of many styles of religious, folk, and classical

Did You Know?

The first important U.S. popular song-writer was Stephen Foster (1826–64). He wrote “Oh! Susanna,” “Swanee River,” and many other songs that people still know.

music. In the 1800s concert bands and traveling musical groups brought popular music to more and more people.

In the late 1800s and early 1900s the United States became an important center of popular music. Songwriters in New York City wrote many popular songs. African Americans created jazz and other new forms of popular music.

In the early 1900s phonograph records appeared, so people could listen to music in their homes. Soon the first radio stations began broadcasting orchestras playing popular songs.

Rock and roll, a mixture of country and blues music, appeared in the 1950s. Rock and roll became wildly popular with young people. Rock is still the best-known form of popular music.

In the late 20th and early 21st centuries radio, television, movies, and the Internet helped popular music to grow and to change. These inventions made it possible for millions of people to hear a single song at the same time. They also helped to make popular music into the huge business that it is today.

► More to explore

Blues • Country Music • Jazz • Music
• Rap • Rock Music • World Music

Porcupine

Porcupines are rodents with sharp spines called quills. The quills are stiff hairs about 3 inches (7.5 centimeters) long that act as armor to protect the porcu-

pine. Many people believe that porcupines can shoot their quills, but this is not true.

Porcupines live in Europe, Africa, Asia, and throughout the Americas. Some porcupines live on the ground and others live in trees. They sleep in caves, in holes in trees or on the ground, or in hollow logs.

Porcupines are stout, short-legged animals. They often move slowly. Their color ranges from grayish brown through dark brown to blackish. The quills are generally white with black tips or bands of yellow, orange, or black. Some porcupines have more than 30,000 quills.

When threatened, a porcupine may grunt and stamp its back feet in warning. It also sticks up its quills and rattles them. The quills come off easily and can stick in the enemy’s skin. The quills can seriously hurt or even kill other animals.

Porcupines are basically plant eaters. Some like to eat the layer beneath bark



A porcupine drinks at a water hole in Africa.

and can damage trees. Others eat roots and fruit and can ruin crops.

► More to explore

Rodent

Porpoise

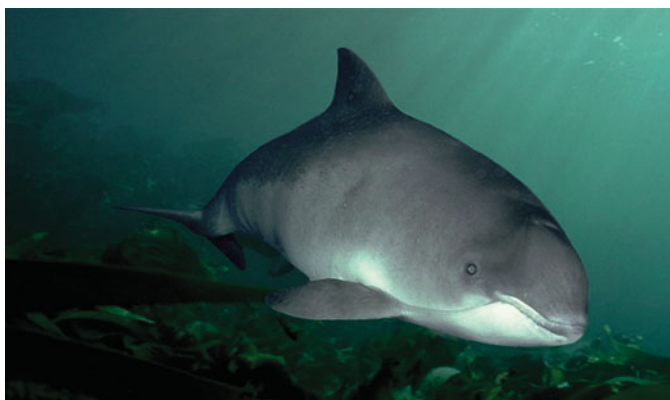
Porpoises are the smallest members of the large group of animals called whales. People often confuse porpoises with their close relatives, the dolphins. Porpoises and dolphins have a similar appearance, but a porpoise is usually smaller and chubbier than a dolphin. It also has a shorter and more rounded snout.

There are six species, or types, of porpoise. Most live in the oceans and seas north of the equator. The harbor porpoise is one of the most common species. It lives in the northern parts of the Atlantic and Pacific oceans. South of the equator, porpoises live along the coast of South America and in the area of the East Indies.

Porpoises grow to no more than 7 feet (2 meters) long. The skin is smooth, usually with a color pattern combining black, white, and gray. Porpoises have two flippers on their sides, and most have a triangle-shaped fin on the back.

Porpoises are mammals and not fish. Porpoises have lungs and need to come to the water's surface to get air. They breathe through a single nostril, called a blowhole, on the top of the head.

Porpoises generally swim together in small groups of two to four. About 10 to



The harbor porpoise got its name because it is often seen in bays and harbors.

12 months after mating, a female porpoise gives birth to a single offspring called a calf. The harbor porpoise usually lives for about 6 to 10 years, but other types live longer.

► More to explore

Dolphin • Mammal • Whale

Port

► see Harbor.

Port-au-Prince



Population
(2003 census),
city, 703,023;
urban area,
1,977,036

Port-au-Prince is the capital of Haiti, an island country in the Caribbean Sea. It is the largest city in Haiti by far. It lies on a bay of the Gulf of Gonâve. The city



Haitians dance during a parade in Port-au-Prince.

has suffered from many fires and violent conflicts.

Haiti is a poor country. Many people in Port-au-Prince do not have jobs. Factories in or near the city process foods and make clothing. Shipping also brings money to Port-au-Prince. The city is Haiti's main port.

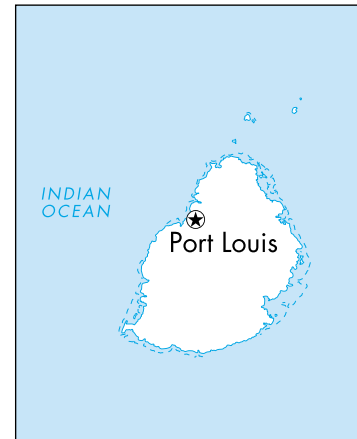
The French founded Port-au-Prince in 1749. At the time France ruled what is now Haiti as a colony. They made Port-au-Prince the capital of the colony in 1770. Earthquakes damaged the city twice in the 1700s.

In 1804 Haiti became an independent country. Port-au-Prince was its capital.

In the late 20th and early 21st centuries Port-au-Prince was sometimes the site of fighting. Several times rebel groups overthrew or tried to overthrow the government of Haiti in the city.

► **More to explore**
Haiti

Port Louis



Population
(2007 estimate)
148,940

Port Louis is the capital of Mauritius, an island country in the western Indian Ocean. It is on the country's main island, which is also called Mauritius. Port Louis is the country's largest city and main port. It lies between mountains and a harbor.

Shipping goods through the port is important to the economy of Port Louis. Industries in the city make clothing, food products, and ships. Tourism also brings money to Port Louis.

The French founded Port Louis in about 1736. It was a port for ships traveling



The waterfront of Port Louis, Mauritius, is popular with tourists.

around southern Africa on the route between Europe and Asia. The British took control of the island in the 1800s.

The port became less important after the Suez Canal was opened in 1869. It let ships travel between Europe and Asia without sailing around Africa. In 1968 Mauritius became an independent country with Port Louis as its capital.

► More to explore

Mauritius

Port Moresby



Population
(2004 estimate)
337,900

Port Moresby is the capital of Papua New Guinea, an island country in the Pacific Ocean. The city lies along a harbor on the island of New Guinea.

Factories in Port Moresby make food products and process oil. The city has a port on the harbor. Shipping goods through the port brings money to the city.

Port Moresby began after the British captain John Moresby explored the harbor in 1873. A settlement grew along the harbor. In the 1880s the British took control of the area. They made Port Moresby their base on New Guinea.



Some of the houses in Port Moresby, Papua New Guinea, stand on stilts over the water.

Australia took control of the area in the early 1900s. During World War II (1939–45) Australia had a military base at Port Moresby. The Japanese tried to capture the city. Port Moresby was damaged by bombing but was later rebuilt.

Papua New Guinea became an independent country in 1975. Port Moresby was made its capital.

► More to explore

Papua New Guinea

Port of Spain



Population
(2006 estimate), city,
49,800; (2004 estimate), urban
area, 264,000

Port of Spain is the capital of Trinidad and Tobago, an island country in the Caribbean Sea. The city lies on the coast



The president of Trinidad and Tobago lives in a fine house in Port of Spain, on the island of Trinidad.

of the island of Trinidad. It is the country's main port.

Unlike other places in the Caribbean islands, Port of Spain is not dependent on tourism. Instead, the city has many different industries that contribute to its economy. Port of Spain is a center of manufacturing, business, and trade. Factories in Port of Spain make drinks, processed foods, clothing, and other products. Shipping goods through the port also brings money to the city.

Port of Spain was originally a small Native American fishing village. The Spanish took control of the island of Trinidad in the 1500s. In 1784 they made Port of Spain the capital of Trinidad. Great Britain took over Trinidad in the late 1700s.

A large fire damaged Port of Spain in the early 1800s, but it was rebuilt. Trinidad and Tobago became an independent country in 1962. Port of Spain was its capital.

► **More to explore**
Trinidad and Tobago

Porto-Novo



Population
(2004 estimate)
234,300

Porto-Novo is the capital of Benin, a country in western Africa. It lies on the coast along a pool of water connected to the Atlantic Ocean. Benin's lawmakers meet in Porto-Novo. However, the president's office and most other government offices are in Cotonou, the country's largest city.

Porto-Novo lies within a farming area. The farmers sell their products in the city.

A people called the Allada founded the town in either the late 1500s or the early 1700s. The Portuguese also established a trading post there. In the 1700s they made Porto-Novo a center of the slave trade. The Portuguese shipped Africans out from the city to the Americas for use as slave labor.

The French conquered the region in the late 1800s. They made Porto-Novo the capital of their colony of Dahomey. In 1960 Dahomey became an independent country. Porto-Novo was its capital. In 1975 the country was renamed Benin.

► **More to explore**
Benin

Portugal



Portugal has a long seacoast and many beaches.

Portugal is a small country on the western edge of Europe. About 500 years ago Portuguese sailors were some of the first Europeans to explore the world. Portugal's capital is Lisbon.

Geography

Portugal sits on the Iberian Peninsula, a piece of land in southwestern Europe. It shares the peninsula with Spain, which lies to the north and east. The Atlantic Ocean lies to the west and south. The Azores and the Madeira islands are also part of Portugal. They lie far off the mainland, in the Atlantic Ocean.

Northwestern Portugal is hilly and rainy. The northeast is mountainous and drier. It contains the mainland's highest mountain range, the Estrela Mountains. Southern Portugal has low plains and gentle hills. In general, Portugal's win-

ters are mild and humid, and the summers are warm and dry.

Plants and Animals

Forests of oak, beech, chestnut, and pine trees grow in the north. The south has shrubs, grasses, and small groups of cork oak and other trees. Animals include foxes, rabbits, hares, goats, and deer. Wolves live in the Estrela Mountains.

People

Most of Portugal's people are Portuguese. There are small groups of Africans, Brazilians, and other Europeans. Portuguese is the national language. The main religion is Roman Catholicism. Most people live in cities and towns, mainly in the north.

Economy

Services and manufacturing are important parts of Portugal's economy. Ser-



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Portuguese folk dancers perform a traditional dance.

vices include tourism, banking, and health care. Manufacturers make clothing, shoes, machinery, vehicles, cork and wood products, and other goods. Portugal sells many of those goods to other countries.

Farming is a small part of the economy. However, Portugal is famous for its port and Madeira wines, which are made from local grapes. Other crops include potatoes, tomatoes, olives, and grains.

History

Iberian peoples settled in what is now Portugal more than 7,000 years ago. Celtic peoples began to arrive about 3,000 years ago. Ancient Rome ruled the Iberian Peninsula from the 100s BC to the AD 400s. Germanic peoples controlled much of the land until Muslims invaded in 711.

The Muslim invasion left only northern Portugal in Christian hands. In 1179 the kingdom of Portugal was established there. It expanded as it reconquered the

Muslim-held lands. The reconquest was done by about 1250.

Age of Discovery

The kingdom of Portugal soon became one of Europe's great powers. At the same time the Portuguese forced many Jews to become Christians or to leave Portugal.

In the 1400s Portuguese explorers began sailing to Africa, India, Indonesia, China, the Middle East, and South America. Bartolomeu Dias and Vasco da Gama discovered new routes from western Europe to Asia. In 1500 Pedro Álvares Cabral claimed Brazil for Portugal. By the 1500s Portugal had a huge overseas empire.

Foreign Control

Spain took over Portugal in 1580. A Portuguese revolution forced out the Spanish in 1640. France attacked Portugal in the early 1800s. The Portuguese royal family escaped to Brazil. In 1821, after France was defeated, the Portuguese king returned to Portugal.

Modern Portugal

Portugal overthrew its monarchy in 1910. The military seized power in 1926. A dictator (a leader with absolute power) ruled the country for many years after that. Portugal finally held free elections in 1976. Today Portugal is a member of the European Union.

► More to explore

Dias, Bartolomeu • European Union
• Gama, Vasco da • Lisbon

Facts About PORTUGAL



Population
(2008 estimate)
10,649,000

Area
35,580 sq mi
(92,152 sq km)

Capital
Lisbon

Form of government
Republic

Major cities
Lisbon, Porto,
Amadora, Braga,
Coimbra

Poseidon

Poseidon was the god of the sea in ancient Greek mythology. According to legend, he was one of the 12 chief gods who lived on Mount Olympus.

Poseidon also was said to have a palace under the sea. Poseidon's main symbols were the dolphin and the trident (a three-pronged spear). The name Poseidon means "husband of Earth" or "lord of Earth." The ancient Romans called Poseidon by the name of Neptune.

According to legend, Poseidon was the son of Cronus and Rhea, who were Titans. The Titans were a race of giants who once ruled the world. Poseidon had two brothers, Zeus and Hades. Together they defeated the Titans and took power. Zeus became the supreme ruler on Earth, and Hades became the lord of the underworld. Poseidon became the ruler of the oceans.

The ancient Greeks believed that Poseidon could use his trident either to stir up storms at sea or to calm the waves. He also used his trident to shatter rocks. Because of this, he became known as the god of earthquakes.

The Greeks also honored Poseidon for creating the horse and giving it to humans. He was the father of the winged horse called Pegasus. Poseidon's own horses had golden manes and pulled his chariot over the sea. In ancient works of art Poseidon is some-



In ancient Greek mythology, Poseidon was the god of the sea.

times shown riding on the backs of dolphins or carrying his trident.

► More to explore

Hades • Mythology • Titans • Zeus

Postal Service

A postal service is a system used to send mail (letters and packages) from one place to another. Today people can send mail nearly anywhere in the world.

How Postal Services Work

People pay for using postal services in several ways. Senders may pay by putting a stamp on the mail. They may also take their mail to the post office and pay a clerk or a postage machine. Heavier mail costs more to send. People mail their letters and packages by placing them in a mailbox or taking them directly to the post office.

At the post office, postal workers sort the mail by size. Letters go through a machine that cancels the stamps. This means that the machine prints lines over the stamps so that they cannot be used again. The machine also prints the date, the time, and the place of stamping. This is called the postmark.

Postal workers then sort the mail according to its destination (the place where it



Many letter carriers deliver mail on foot.

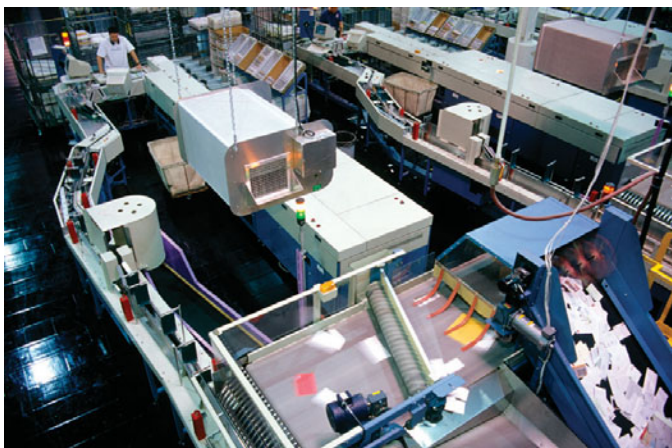
is going). They may sort it by hand or with the help of machines.

Postal workers send the mail to its destination by truck, train, ship, or airplane. Postal services around the world cooperate so that mail can even travel between countries. At the destination, letter carriers deliver the mail to each address. Many letter carriers travel on foot or in small mail trucks.

History

Postal services have been an important method of communication for thousands of years. Egypt had a postal service in about 2000 BC. The Chinese used riders on horseback to deliver mail by about 1000 BC. For hundreds of years governments sent almost all mail.

Then, in the AD 1200s, trade between faraway countries began to increase. To communicate about trade, groups of



Modern postal services have machines to sort the mail.

business owners and bankers set up their own private postal services. Towns, workers' groups, religious groups, and universities also set up ways to send and receive messages.

In the 1500s and 1600s most private postal services went out of business. National governments took over most postal services. One famous private service that emerged later was the Pony Express. It delivered mail on horseback in the western United States in the early 1860s.

National governments still run most postal services. Since the early 1970s private companies have also offered some services, especially the delivery of packages. In the 1990s many people began to send faxes and e-mail instead of written letters. However, people today still use postal services, especially when they want to send important or private information.

► More to explore

Communication • Pony Express • Stamp

Potato

The potato is one of the main food crops of the world. It grows well in cool climates. Potatoes are often boiled, fried, or baked. They are served whole or mashed, cut up into fries, or made into potato chips.

The potato belongs to the nightshade family of plants, which also includes eggplant, tomatoes, and garden peppers. The scientific name of the potato is



Potatoes are thick, underground stems of a potato plant.

Solanum tuberosum. It is not related to the sweet potato.

The potato plant can grow to 20 to 40 inches (50 to 100 centimeters) high. It bears white or purplish flowers. The leaves are about 8 to 12 inches (20 to 30 centimeters) long and divided into parts called leaflets.

The stems of the potato plant grow underground. The ends of the stems thicken to form potatoes. The potatoes have buds, or “eyes,” that can grow into new potato plants. The skin of a potato varies in color from brownish white to deep purple. The inside is usually white or yellow, but it can be purple.

Indians of South America might have grown potatoes as early as 1,800 years ago. Spanish explorers of the Americas brought potatoes back to Europe in the 1500s. By the end of the 1600s potatoes were the major food crop in Ireland. In the 1840s disease ruined the potato crop

in Ireland. A famine resulted. More than a million people died from starvation or diseases related to the famine.

► **More to explore**

Famine • Sweet Potato • Tomato

Potawatomi



A Potawatomi dancer wears traditional clothing.

The Potawatomi are a Native American people who traditionally lived near the Great Lakes. Their lands included parts of what are now the states of Michigan, Wisconsin, Illinois, and Indiana. They were closely related to their neighbors, the Ottawa and the Ojibwa.

The Potawatomi built large, bark-covered houses. They also built smaller, dome-shaped homes called wigwams. They grew corn and squash and gathered berries, seeds, and wild rice. They fished and hunted deer, bison (buffalo), elk, and small animals.

French explorers entered Potawatomi lands in 1634. The tribe gave the French furs in exchange for metal tools, beads, cloth, and guns.

In the 1830s the U.S. government forced the Potawatomi to give up much of their land. Some of the tribe fled to Canada. Most Potawatomi moved to a reservation in what is now Kansas. The Kansas Potawatomi became known as the Prairie Band. In the late 1860s some of the Kansas Potawatomi moved to Indian Territory (now Oklahoma). They became known as the Citizen Band.

At the end of the 20th century there were about 16,000 Potawatomi in the United States. Most lived in Kansas, Oklahoma, Michigan, Wisconsin, and Indiana. A small group lived in Canada.

► **More to explore**

Native Americans • Ojibwa

Pottery

Pottery is the art of making objects of clay. The clay is shaped and then fired (baked at a high temperature) to harden it. The items created in this way also are called pottery. Like brick and tile, pottery is a type of ceramic, a material made from nonmetallic minerals.

Ancient peoples all around the world made pottery. Pottery was a useful invention because it could carry water or store food. Yet it also became a form of art and a way to tell stories through its paintings. Archaeologists study ancient pottery because it provides clues as to



Ancient Greeks of the Minoan civilization made decorated pots in about 1700 BC.

how people lived, what they believed in, how they fought, and what they ate.

Today factories mass-produce many kinds of pottery. But potters around the world still handcraft fine pieces that are more like works of art.

Types of Pottery

There are three basic types of pottery—earthenware, stoneware, and porcelain. Earthenware is the simplest and oldest form of pottery. Water can soak through earthenware even after it is fired. But when earthenware is coated with a substance called a glaze, liquid cannot soak through. The glaze is melted under high heat to form a glassy surface.

Liquid cannot soak through stoneware and porcelain even when they are left unglazed. If a glaze is applied, it is only for decoration. Stoneware is very hard. Porcelain is smooth, light, and thin, and usually light can shine through it. Both stoneware and porcelain originated in

China more than 1,000 years ago. China has been a leading center of pottery since ancient times. Many people still call porcelain “china.”

How Pottery Is Made

One of the simplest ways to make pottery is with long ropes of clay. The potter coils these ropes on top of each other to make a bowl or vase shape. Then the potter smooths the surface.

In another method, called slip casting, the potter pours liquid clay into a mold. The clay then hardens into the desired shape. Slip casting is useful for making pottery in flat or unusual shapes.

Pottery is often made on a potter’s wheel—a round, flat surface that spins around. The potter puts a chunk of clay on the wheel and then shapes the spinning clay into a pot or other rounded object. Because the wheel spins, it is easy for the potter to keep the sides even.



Chinese porcelain vases from the late 1600s or early 1700s are decorated with scenes of daily life.



A man in India makes pottery on a wheel he spins with his foot.

When the pottery is dry, it is ready to be fired. The potter places it in a kiln, or high-temperature oven. Earthenware may need a temperature of 1,400° F (760° C), while stoneware or porcelain may need 2,700° F (1,480° C).

After firing, the hardened pottery can be glazed and painted. Glazes are made of ground minerals that produce different colors. Paint may be applied either under or over the glaze. After glazing and painting, the pottery is often fired again so that the glaze hardens and becomes shiny.

► More to explore

Ceramics • Clay • Decorative Arts
• Sculpture

Poultry

Poultry are birds that people raise for meat, eggs, and feathers. Domesticated (tame) chickens, turkeys, geese, and ducks are poultry. People learned how to raise poultry thousands of years ago.

Raising poultry at home meant that a family always had eggs and meat to eat.

Today raising poultry is one of the largest agricultural, or farming, businesses in the world. Poultry are usually raised inside large, modern buildings. A building may have as many as 70,000 birds. But some farmers allow their birds to roam free during the day. These birds usually roost, or sleep, inside. They also come inside to lay their eggs. Farmers feed their birds special diets. They control the diseases and keep away the predators that may harm the birds.

Poultry come in many different colors and sizes. Kinds of poultry are grouped together by breed. A breed is a group of birds that share certain traits—for example, feather color, egg color, and their type of comb. (A comb is the fleshy growth on the head of a chicken.)

► More to explore

Chicken • Duck • Goose • Turkey



A woman sprays disinfectant to kill germs in a large chicken house in India.

Powell, Colin



Colin Powell

Colin Powell was an important military and political figure in the United States in the late 20th and early 21st centuries. He was a general in the Army. He also served as secretary of state to President George W. Bush.

Colin Luther Powell was born on April 5, 1937, in New York City. His parents were immigrants from Jamaica. Powell studied geology at the City College of New York. He graduated in 1958 and became a U.S. Army officer.

Powell earned medals while serving in the Vietnam War in the 1960s. He then rose in the ranks of the Army. He was often assigned to help high officials in Washington, D.C.

In 1989 Powell became the country's top military officer, with the title of chairman of the Joint Chiefs of Staff.

Powell became well known as a commander in the Persian Gulf War of 1991.

Powell retired from the Army in 1993. Many people wanted him to run for president in 1996, but he chose not to run. In 2001 President Bush appointed Powell as secretary of state. Powell became the first African American to hold that position.

Powell's biggest challenge as secretary of state was to get other countries to support a U.S.-led invasion of Iraq, which began in March 2003. Powell retired as secretary of state in January 2005.

► More to explore

Bush, George W. • Persian Gulf War

Prague



Population
(2007 estimate)
1,188,126

Prague is the capital of the Czech Republic, a country in central Europe. The city lies on the Vltava River. It is the largest city in the Czech Republic.

Prague is a beautiful city known for its buildings and cultural life. The city has many historic churches and palaces. Its most famous landmark is the ancient



Arched bridges span the Vltava River in Prague, Czech Republic.

castle of Hradcany. The Charles Bridge is a stone bridge built in the 1300s.

Each spring Prague hosts an international festival of classical music. The city has two world-class orchestras and many theaters.

Economy

Industries in Prague are very important to the economy of the Czech Republic. Most people in the city work in industries that provide services, such as tourism, banking, and trade. Manufacturing also brings money to Prague. Factories in the city make machinery, chemicals, food products, and electronics.

History

Prague dates back to at least the 800s. The rulers of the country called Bohemia made it their capital in the 900s. The city became one of Europe's major centers of trade and culture.

In 1918 an independent country called Czechoslovakia was created in central Europe. Prague was its capital.

German troops controlled Prague from 1939 to 1945, during World War II. A few years later Czechoslovakia became a Communist country. The Soviet Union invaded Prague in 1968 to make sure that the country stayed Communist. In 1989 Prague's citizens held large protests against Communism. Soon afterward Communism ended in Czechoslovakia.

In 1993 Czechoslovakia broke into two separate countries, the Czech Republic and Slovakia. Prague became the capital of the Czech Republic.

► More to explore

Czech Republic

Praia



Population
(2005 estimate)
111,500

Praia is the capital of Cape Verde, an island country off the northwest coast of Africa. It is the largest city in Cape Verde. It lies on São Tiago, the country's largest island.

Praia has a port on the Atlantic Ocean. Ships load up there with foods, shoes, clothing, and other products for sale overseas. Factories in the city process fish.

No one lived on the islands of Cape Verde in ancient times. The Portuguese began settling the islands in the 1460s. They first settled the town of Ribeira Grande, which became the first capital. They later moved the capital to Praia. This was partly because Praia's harbor was safer for ships involved in the slave trade. The slave trade became a major part of the city's economy. Slavery ended on the islands in 1876.

Cape Verde became an independent country in 1975. Praia remained its capital.

► More to explore

Cape Verde

Prairie Dog

Prairie dogs are rodents that bark like dogs. They belong to the squirrel family. Prairie dogs are known for their large underground colonies. Sometimes called



A black-tailed prairie dog can look out over prairie grass when it stands upright.

towns, these colonies have many rooms and tunnels.

There are five species, or types, of prairie dog. The best known are the black-tailed prairie dog and the white-tailed prairie dog. Prairie dogs live on prairies in western North America.

Prairie dogs have plump bodies and short legs. Their claws are long and powerful. Not including their tails, prairie dogs are about 11 to 13 inches (28 to 33 centimeters) long. They can weigh almost 4 pounds (2 kilograms). Most prairie dogs have yellowish brown fur.

Prairie dogs are active in the daytime. During winter, three of the species hibernate. This means that they stay inactive until spring.

A female prairie dog gives birth to a litter of up to 10 young. After about two years the male young are driven away. They move to new colonies. Females usually stay.

Prairie dogs eat grass. Sometimes they leave little grass for cattle. For this reason some people consider prairie dogs a pest.

Other people think prairie dogs are very important. They say that many animals depend on the prairie dog. Foxes, coyotes, badgers, and hawks eat prairie dogs. Rabbits and snakes live in holes dug by prairie dogs.

► More to explore

Rodent • Squirrel

Did You Know?

The largest prairie dog colony ever seen was in Texas. It contained about 400 million prairie dogs.

Pregnancy

► see Gestation.

Prehistoric Life

Long before people appeared on Earth, other forms of life existed. Many of these living things are now extinct, meaning they have died out completely. The period when they lived is called prehistory, or prehistoric times.

Everything that people today know about prehistoric plants and animals comes from fossils. Fossils are the remains or traces of early life-forms. They are often found in rocks.

Precambrian Life

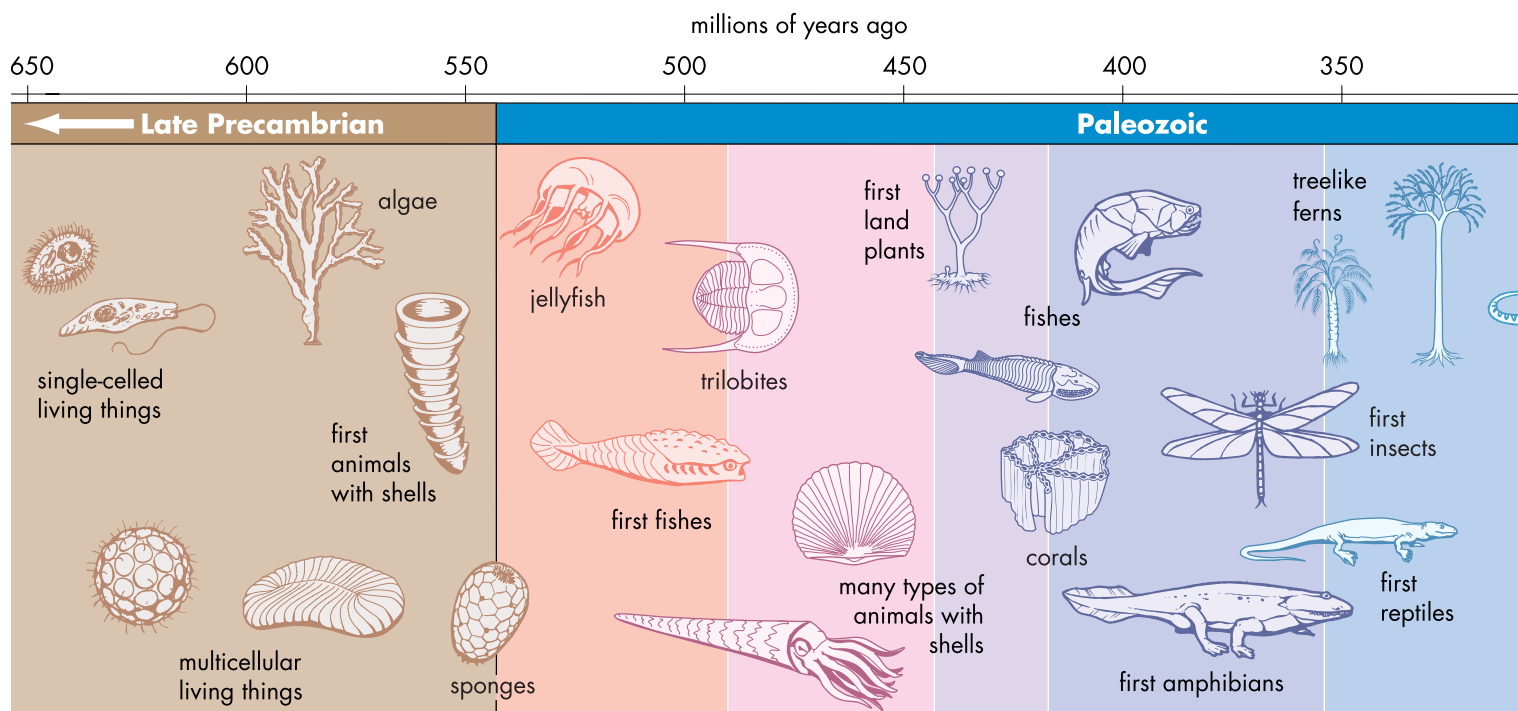
The earliest life-forms developed during the earliest period of Earth's history, called Precambrian time. Precambrian

time began with the formation of Earth's crust, about 4 billion years ago. It ended about 543 million years ago. Scientists do not know exactly when life-forms first appeared, but the oldest known fossils are more than 3 billion years old.

The first life-forms had only one cell. They included early types of bacteria, algae, and protozoans. Living things with more than one cell began to appear late in the Precambrian. All life at this time lived in Earth's oceans.

Paleozoic Life

The next period of Earth's history is called the Paleozoic era. It lasted from about 543 million years ago to about 248 million years ago. At first, all living things were in the oceans. By the end of the era, plants and animals also lived on land.



Over hundreds of millions of years, life spread through the seas and over Earth's surface.

Ocean Life

Early Paleozoic animals were similar to the jellyfish, sponges, and worms that live in oceans today. Other animals in the oceans were arthropods—the early ancestors of crabs, insects, and spiders. Arthropods called trilobites were common sea animals. They were oval and often measured 6 to 7 inches (15 to 18 centimeters) long. Trilobites became extinct by the end of the Paleozoic era.

The first fish appeared about 450 million years ago. These animals did not look much like fish today. They had armorlike shells and no jaws. Later fish developed jaws, a backbone, and fins.

Life on Land

By about 400 million years ago early plants had started growing on land. By the end of the Paleozoic era there were forests of large, treelike ferns. Huge

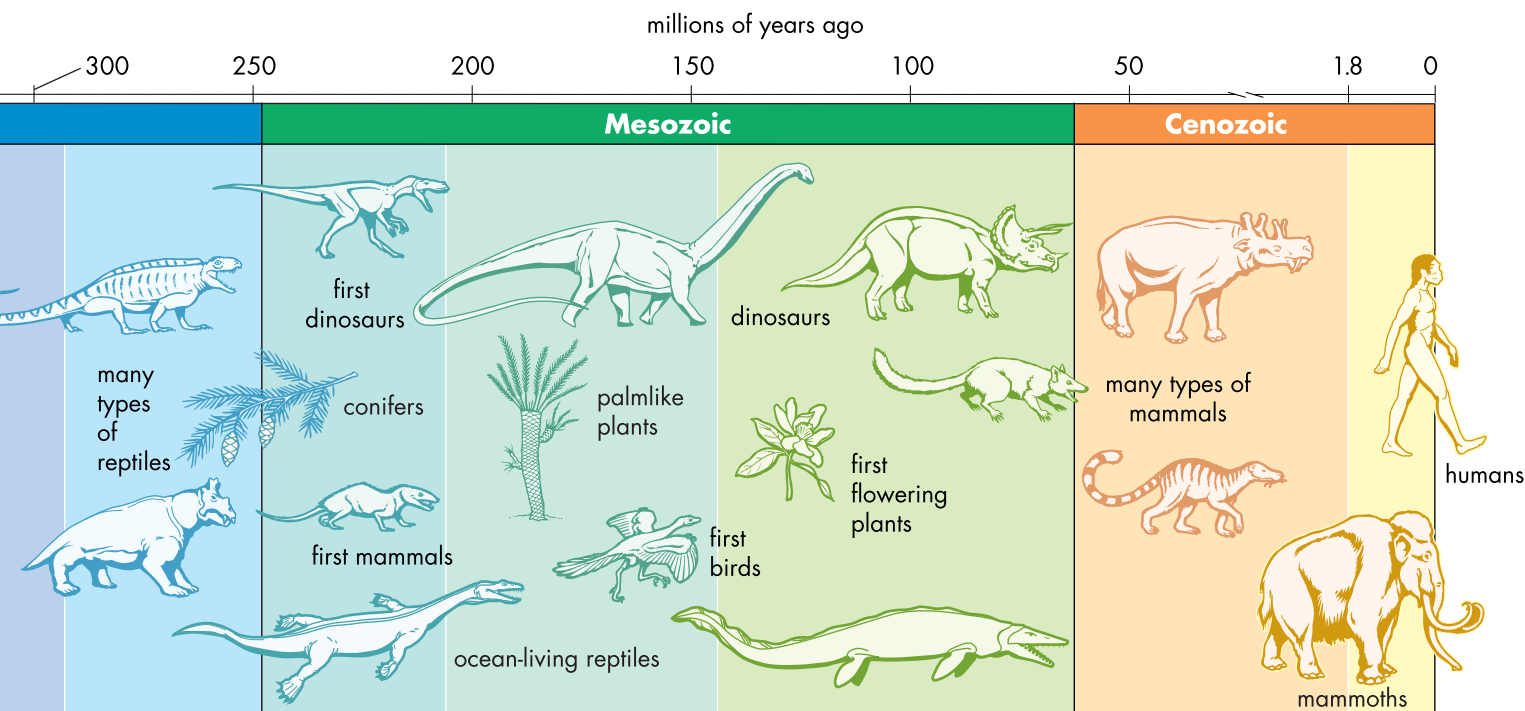
swamps also developed near the equator. In general, northern lands were dry and warm. Ice sheets covered the south.

Meanwhile, some of the arthropods in the oceans went through changes that let them live on land. They eventually evolved, or developed, into the first centipedes, insects, and spiders. Some fish also developed body parts that allowed them to live on land. They became amphibians, or animals that live both in water and on land.

Reptiles evolved from amphibians by about 300 million years ago. Reptiles were the first animals with a backbone to live entirely on land.

Mesozoic Life

The Mesozoic era followed the Paleozoic era. It lasted from about 248 million years ago to about 65 million years ago.



The first life-forms were very simple. Later forms were more complicated and more varied.

Large reptiles called dinosaurs dominated the land during this era. Some dinosaurs fed on palmlike plants and evergreen trees, which grew well in the mild to warm climate. Other dinosaurs preyed on other animals. Large reptiles also lived in the oceans and flew in the air.

Mammals evolved from reptiles during the Mesozoic era. The earliest mammals appeared by 200 million years ago. They were small, shrewlike creatures.

Birds also appeared during the Mesozoic era. They evolved from reptiles by about 150 million years ago. The earliest birds had wings and feathers like modern birds. But they also had teeth and claws.

All dinosaurs became extinct by about 65 million years ago. But other reptiles, including the ancestors of snakes, turtles, crocodiles, and lizards, survived. Birds, mammals, insects, flowering plants, and other life-forms also survived.

Cenozoic Life

The next period in Earth's history is the Cenozoic era. It began about 65 million years ago and continues today.

Many mammals developed during this era. The first horses, rhinoceroses, pigs, hippopotamuses, camels, deer, giraffes, sheep, cattle, and apes appeared. By about 4 million years ago the ancestors of humans, called hominins, had appeared. Early forms of humans developed between 2 million and 1.5 million years ago.

Between 1.8 million and 10,000 years ago large ice sheets covered much of Earth. During four periods, known as ice ages, glaciers moved across the northern half of the planet. Long warm periods separated the ice ages. During this time such huge mammals as woolly mammoths, mastodons, and saber-toothed cats roamed the land. But by the end of the ice ages, most of the huge mammals had died out.

Early humans hunted mammoths and other animals. They made and used stone weapons and tools. For this reason this period of prehistory is known as the Stone Age. The Stone Age ended at different times in different places. It ended as humans began to farm, settle in villages, and make tools out of metal. About 5,000 years ago humans began to write. Prehistory then ended, and human history began.

► More to explore

Dinosaur • Earth • Evolution • Fossil • Human Origins • Mastodon and Mammoth • Stone Age

Presley, Elvis

Elvis Presley was a famous popular-music star in the United States. He was one of the first musicians to sing and play rock music. For this he is often called the King of Rock and Roll.

Elvis Presley was born on January 8, 1935, in Tupelo, Mississippi. His family was very poor. In the late 1940s the Presleys moved to Memphis, Tennessee. As a young man Elvis enjoyed many

Did You Know?

Many animals died out in historical times. They include the dodo bird of Mauritius and the passenger pigeon of North America.



Elvis Presley

different kinds of music, including gospel, blues, and country.

In 1953 Presley went to Sam Phillips' music studio to make a recording for his mother. Phillips had recently started the Sun Records label. He liked Presley's singing. In 1954 Presley made his first recordings for Sun, including "That's All Right Mama," which became a local hit.

In 1955 Presley began recording with RCA Victor, a major record label. Presley's early hits included "Don't Be Cruel," "All Shook Up," and "Hound Dog." He released his first number-one record, "Heartbreak Hotel," in 1956.

Presley became an actor in 1956. His first movie, *Love Me Tender*, was released in that year. He went on to star in more than 30 films.

In 1958 Presley entered the U.S. Army. In 1960 he returned to the United States and continued recording, performing, and acting. In the 1970s Presley had problems in his personal life. When not performing, he spent almost all of his time at Graceland, his mansion in Memphis. Presley died on August 16, 1977.

► More to explore

Popular Music • Rock Music

Pretoria



Population
(2005 estimate),
urban area,
1,282,000

The country of South Africa has three capitals—Pretoria, Cape Town, and Bloemfontein. Pretoria is home to the president's office and many other government offices.

Pretoria lies on the Apies River. The city is famous for its jacaranda, a type of tree that has purple flowers.

Most people in Pretoria work for the government or in trade, banking, or other service industries. Factories in the city make metal products, processed foods, cars, and other products.

A people called the Boers founded the city in 1855. The Boers were descen-



Pretoria has many tall buildings and several large parks.

dants of earlier Dutch settlers. The city was named Pretoria after Andries Pretorius, a Boer leader.

In 1910 the country of South Africa was created. Pretoria became one of its capitals.

In 2000 Pretoria became a part of the Tshwane Metropolitan Municipality. The municipality governs Pretoria and surrounding cities. Tshwane was named after an African chief who lived in the area before the Boers arrived.

► More to explore

Bloemfontein • Cape Town • South Africa

Primate

The primates are a group of mammals that includes some of the most intelligent animals. The major kinds of primates are humans, apes, monkeys, tarsiers, lemurs, and lorises. There are more than 300 species, or types, of pri-

mate. These different types have many physical features in common. For this reason scientists believe that they may share a common ancestor.

Where Primates Live

Humans live nearly everywhere in the world. Most other primates can be found in hot and warm regions of Central and South America, Africa, and Asia.

Nonhuman primates often live in trees.

Physical Features

Some primates are small, and others are large. One type of mouse lemur weighs only about an ounce (35 grams). On the other hand, a gorilla may weigh 600 pounds (270 kilograms).

The bodies of primates share many common features. For instance, primate brains are large compared to the size of their bodies. The brains of humans, apes, and monkeys are especially large and complex. Primates also have eyes that face forward. The view from one eye overlaps the view from the other eye. This helps primates judge the depth and distance of what they see. Special nerve endings in the hands and feet give primates a good sense of touch.

Most primates have thumbs that can bend to meet the other fingers. This allows them to grasp things with their hands. All primates except humans have big toes that can bend and grip in this way, too. Most types also have flat nails on their fingers and toes rather than claws.

Feeding and Reproduction

Primates eat a variety of plants and animals. These may include fruits, flowers, leaves, birds' eggs, insects, and other small animals.

Over the course of their lives, female primates tend to have fewer young than other animals do. Most primates give birth to one baby at a time. The babies take a long time to grow into adults. Primates must take care of their young for much longer than other animals do.

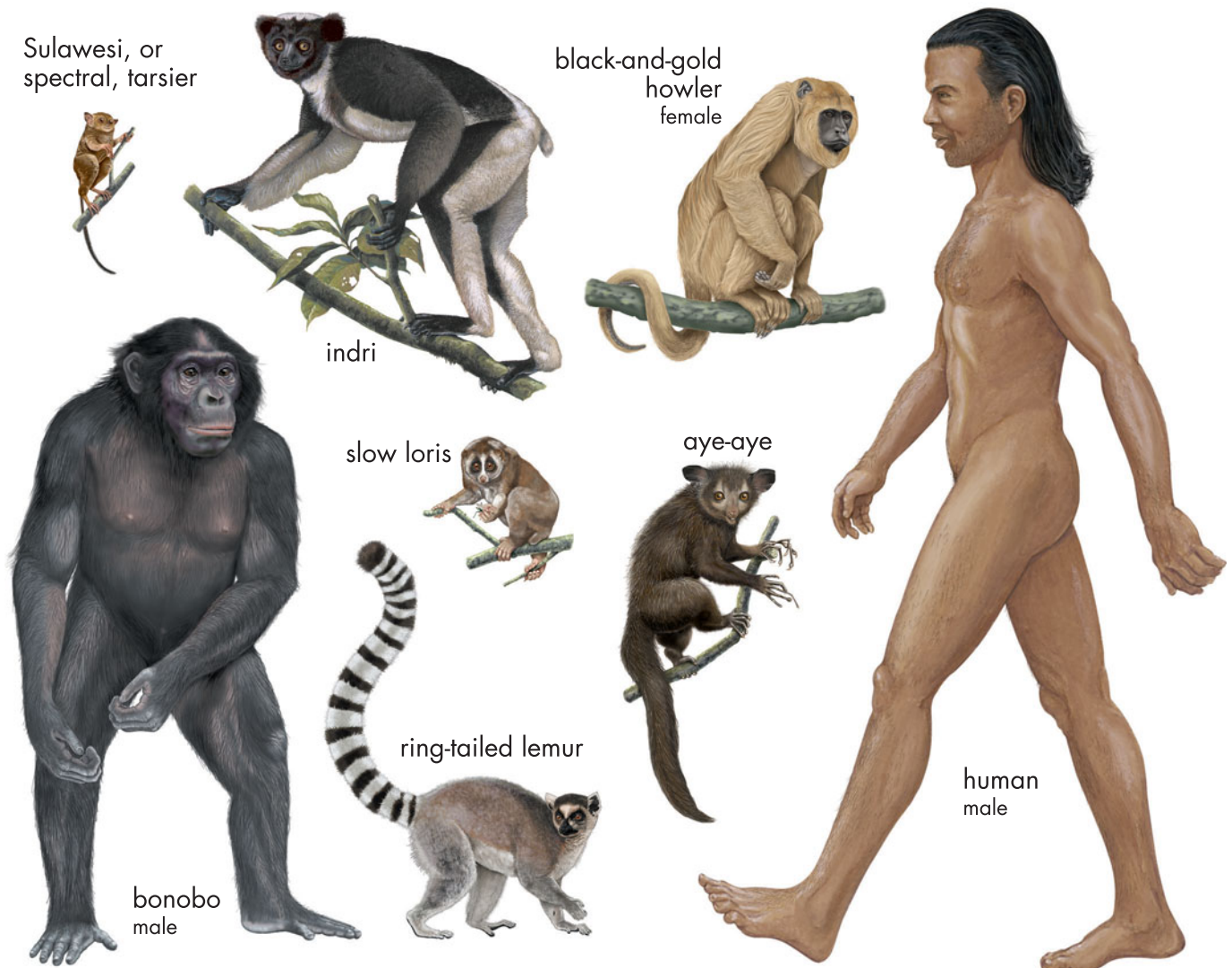
Deep emotional bonds often develop between mother and child.

Primates Under Threat

While the human race keeps getting larger, some other primates are in danger of dying out. Human activities such as logging and farming have destroyed the habitats of some primates. Hunting is another threat to many species.

► More to explore

Ape • Lemur • Loris • Mammal
• Monkey • Tarsier



Primates have many features in common. In general, they have large brains, eyes that face forward, and thumbs that can bend to meet the other fingers.



Prince Edward Island

Prince Edward Island is Canada's smallest and most crowded province. The British named the island after Prince Edward, a son of King George III. The capital is Charlottetown.

Geography

Prince Edward Island is on the east coast of Canada. The province of Nova Scotia lies south and east of the island. It protects the island from the Atlantic Ocean. The Confederation Bridge connects Prince Edward Island to New Brunswick, to the west. Bays cut deeply into the long, narrow island. Most of the island is a gently rolling plain with soil that is good for growing crops. Tiny islands dot the coastline. Sandy beaches attract tourists in the summer.

People

Most of the people of Prince Edward Island are Canadians of Scottish, English, Irish, or French heritage. Some are descended from Loyalists (American colonists who did not want independence from Great Britain) who settled on the island after the American Revolu-



The red cliffs of East Point line the shore at the eastern end of Prince Edward Island.

tion. There are small numbers of American Indians and people with other European or Asian ancestors.

More than half of the people live in rural areas. Still, the island has more people per square mile than any other Canadian province. The port city of Charlottetown is the island's center of government, business, and culture. It is also home to the University of Prince Edward Island. Every summer the city stages a musical based on the children's novel *Anne of Green Gables*, which is set on Prince Edward Island.

Economy

Government services are the largest part of Prince Edward Island's economy. Finance, health care, and retail services



are also important. Technological and scientific services are growing, as is tourism. Manufacturing, especially food processing, is the chief industry.

Farmers grow potatoes, grains, and vegetables. They also raise cattle, pigs, and poultry. Fishers catch lobsters, oysters, fish, and other seafood. The province's forests provide wood for lumber and paper.

History

In early times Micmac Indians from the mainland used the island for fishing, hunting, and planting. The Italian explorer John Cabot may have become the first European to see the island in 1497. The French explorer Jacques Cartier definitely saw the island in 1534.

Another French explorer, Samuel de Champlain, claimed the island for France in 1603. Settlers from France did not arrive until 1720. French speakers from the mainland also set up small communities on the island. The French called the island Île Saint-Jean.

In 1758 British forces occupied the island, and most of the French settlers left. The British governed the island as a part of Nova Scotia. In 1769 they made the island a separate colony. They later renamed it Prince Edward Island.

In 1864 representatives of several provinces met on the island, at Charlottetown, to discuss a plan of confederation, or union. A new country called the Dominion of Canada was formed in 1867. For its early role in the union of



The Confederation Bridge crosses the Northumberland Strait to connect Prince Edward Island with New Brunswick. The bridge is 8 miles (12.9 kilometers) long.

Canada, the island is sometimes called the Cradle of Confederation. However, Prince Edward Island did not join the union until 1873.

At that time many of the island's landowners lived in England. They charged rent to their tenants, or the people living on the land. A law passed in 1875 made it possible for tenants to buy the land. However, the island's economy remained poor. Many people moved away to find work.

Many changes came to Prince Edward Island in the 1900s. Roads, cars, ferries, a radio station, and air service arrived by the 1950s. Tourism helped the economy to grow. The Confederation Bridge to the mainland opened in 1997.

► More to explore

American Revolution • Cabot, John
• Canada • Cartier, Jacques
• Champlain, Samuel de • New Brunswick • Nova Scotia

Facts About PRINCE EDWARD ISLAND

Flag



Population
(2006 census)
135,851

Area
2,185 sq mi
(5,660 sq km)

Capital
Charlottetown

Motto
Parva sub Ingenti
(The Small Under
[the Protection of]
the Great)

When Prince Edward Island Became a Province
1873

Printing



A huge press prints many copies of a newspaper on a long roll of paper. Other machines will cut the roll into sheets.

Printing is a way to make many identical copies of texts and images on paper. Printing began as a way to speed up the process of making copies of books. At first this was a very slow process because it involved copying the text by hand. With the invention of a machine called the printing press, printing became faster and easier. Modern printing by computers can produce hundreds of pages in minutes. People use printing to create books, magazines, money, stamps, maps, posters, billboards, and labels.

Printing Methods

The most common type of printing is electronic printing. It is also known as computer or digital printing. In this method, a writer, editor, or designer creates pages on a computer screen.

Next, laser printers (photocopiers controlled by laser beams) use heat and powdered ink to form an image of the page on a sheet of paper.

Most books are printed from printing plates. In this method, printers transfer the image of several pages to a metal or plastic plate. They may do this by computer or by hand. Next they place the plate in a printing press and put ink on it. Then they feed paper into the printing press. The press transfers the ink onto the paper.

On older kinds of printing plates, all the words and pictures are reversed, as if seen in a mirror. On some older plates, the words and pictures are raised above the surface of the plate. Ink applied to the plate sticks to the raised areas. On other plates, the words and pictures are engraved on, or cut into, the plate. Ink then collects in the cut-out areas.

On newer kinds of printing plates, the image is flat. Special ink sticks to the image but not to the rest of the plate. The inky image is transferred onto a



An artist of the 1800s imagined Johannes Gutenberg and a printer in their workshop.

sheet of rubber. The rubber sheet then prints the image onto paper. Because the image is transferred twice, the words and pictures on the plate do not have to be reversed.

History

By the AD 700s people in China were using carved wooden blocks to make prints. They applied ink to the block and then pressed the block onto paper. This technique was used to make the *Diamond Sutra* in 868. It is the first known printed book.

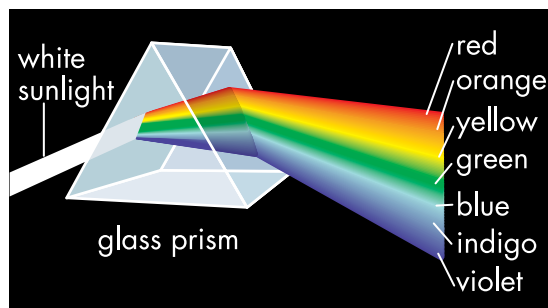
In the 1400s in Germany, Johannes Gutenberg invented a printing press that could make copies of whole pages of text. Gutenberg arranged type (metal blocks with raised, reversed letters on them) on a tray. He rubbed ink on the raised surface of the type. He then used the machine to press a sheet of paper against the inky type. Gutenberg's invention could easily print many copies of a page—and even copies of a whole book.

The printing press created a communication revolution. Before this time, people copied books by hand. It was a slow process, so there were few books available. After the invention of the printing press, more books could be printed and sold. Printing also led to the creation of newspapers.

► More to explore

Book and Bookmaking
• Communication • Gutenberg, Johannes • Newspaper

Prism



A prism shows that white light is actually a combination of many colors.

A prism is a piece of glass or other see-through material that has several flat sides, called faces. Many prisms have three long faces in between two triangle-shaped ends. However, prisms can be made in many forms and shapes. People use prisms to bend light.

Light travels through space in the form of waves. Scientists use an idea called wavelength to describe these waves. Some light waves have long wavelengths, while others have short wavelengths. Each wavelength produces a different color of light.

Usually all the wavelengths of light blend together to form white light. But when light enters a prism, it bends. Light waves of different wavelengths bend by different amounts. The longest wavelengths bend the least. The shortest wavelengths bend the most. This bending separates the light waves so each color can be seen. This band of colors—red, orange, yellow, green, blue, indigo, and violet—is called a spectrum.

Prisms may be found in binoculars, microscopes, and many other instruments. They help to bend the light that enters these instruments toward the viewer's eyes. Scientific instruments called spectroscopes use prisms to separate the energy given off by light sources, such as stars. Each chemical that makes up a star produces a different wavelength of light. Scientists can measure the different wavelengths to tell what the stars are made of.

► More to explore

Light

Prison

Prisons are buildings that hold people who have been convicted, or found guilty, of serious crimes. Of all the world's countries, the United States and China have the most known prisoners.

Purposes of Prisons

Prisons serve three main purposes. They punish criminals by taking away their freedom. They also keep dangerous criminals off the streets. Finally, prisons can help to rehabilitate prisoners, or

make them into better people. Prisons do this by giving prisoners an education, job training, or help in getting over the problems that caused them to commit crimes. These problems may include emotional problems, mental problems, or the abuse of drugs or alcohol.

Types of Prisons

Maximum-security prisons hold people who have been convicted of the most serious crimes—for example, murder or hurting someone with a gun, a knife, or another deadly weapon. Prisons built to hold less dangerous criminals are called minimum-security prisons. Jails are prisons for people who committed small crimes or people waiting for a trial. There are separate prisons for men and women.

History

Until the 1700s most prisons were not used for punishment. Instead of prison, common punishments included death and banishment (sending a person out of the country). Prisons mainly held people who could not pay their bills, people waiting for a trial, and guilty people waiting to be given their sentences, or punishments. By the 1900s, however, most prisons held convicted criminals.

The conditions in early prisons were horrible. Disease, violence, and abuse were common. In the late 1700s reformers (people who work for change) in the United States and Great Britain began to look for ways to improve prisons. By the 1900s many prisons offered prisoners rewards for good behavior, education,



Prisoners live in small rooms called cells.

and job training. Reformers today continue to work for safer and more effective prisons around the world.

► More to explore

Crime

Pristina



Pristina is the capital of Kosovo. It is located in the east-central part of the country.

Pristina is a cultural center for ethnic Albanians, who make up most of the population of Kosovo. A museum in the city teaches about the history and people of the area. Southeast of the city is the Gračanica Monastery. It was built in the 1300s and contains interesting frescoes, or wall paintings. The monastery is a religious center for Serbian Orthodox Christians.

The economy of Pristina relies on services, including trade, health care, government, and businesses that are related to tourism. Lead, silver, and zinc are mined in mountains near Pristina.

Pristina has a long history. It was the capital of all of Serbia, which included

Kosovo, until 1389. In that year the Turkish Ottoman Empire conquered Serbia. Serbia and Kosovo then developed different identities. Serbian leaders made Belgrade their capital.

Serbia eventually gained independence from the Ottomans and regained Kosovo. But by the late 1900s Kosovo wanted independence from Serbia. During fighting in the late 1900s and early 2000s several cities in Kosovo were heavily damaged. Pristina did not suffer as much damage. Many people moved to the city because of that. Kosovo declared its independence from Serbia in 2008 with Pristina as its capital.

► More to explore

Kosovo

Prometheus

In ancient Greek mythology Prometheus was a god of fire. He was also a trickster and a master craftsman. Prometheus was one of the Titans. The Titans were giants who once ruled the world.

In one story Zeus, the chief god, had Prometheus and his brother Epimetheus create the animals and people. Epimetheus made the animals first. He gave them all the best qualities, such as strength and speed. He also protected them with fur and feathers.

Epimetheus then realized that he had little left to give people. He asked Prometheus for help. Prometheus stole fire from the gods and gave it to humans.



In ancient Greek mythology, Prometheus stole fire from the gods and gave it to humans.

Zeus saw what Prometheus had done and became angry. He had Prometheus tied to a rock. Every day an eagle ate

Prometheus' liver. Every night he grew a new liver for the bird to eat the next day. Eventually the hero Heracles (or Hercules) freed him.

Zeus also punished humans after Prometheus gave them fire. Zeus sent the first woman, named Pandora, to Earth. Her curiosity is said to have brought troubles into the world.

► More to explore

Heracles • Mythology • Pandora • Zeus

Protective Coloration

Some animals have special colors or markings called protective coloration. These markings protect animals from predators, or animals that will eat them. Some markings are a kind of camouflage, meaning that they help the animal blend in with its surroundings. Others help scare predators away by making the animal appear dangerous.

Camouflage

Many animals have body colors that match their usual surroundings. This helps them to hide from predators. Snowshoe hares, for example, have white fur in winter to blend in with snow. For the rest of the year their fur is brown, to match the ground. Insects known as walkingsticks are long, thin, and green or brown. Their color and shape make them look like parts of the plants on which they feed. Some animals, such as cuttlefish, can even



A toad's coloring allows it to blend in with a clump of leaves.

change their color and pattern to match their surroundings.

Spots, stripes, and other color patterns help to mask the true shape of some animals. For example, the stripes on zebras make it hard for predators to tell exactly where each zebra is. But patterned fur also helps some predators. The spots or stripes of many big cats help them to hide as they move closer to their prey.

Warning Colors

Some animals use color to warn others not to bother them. These animals often have poison or other weapons to defend themselves. Some poisonous snakes and frogs are brightly colored. Bees, which are known for their stings, often have bold stripes of yellow and black. Predators may avoid these animals because they have learned to associate bright colors with pain.

Some harmless animals have the same colors as dangerous or bad-tasting animals. These colors trick predators into

staying away. This type of coloration is called mimicry.

How Coloration Develops

Animals gain helpful traits through a process called natural selection. If an animal happens to be born with such a trait, it is more likely than others to survive. It therefore has a better chance of having offspring. If the animal passes on the trait, the offspring, too, will have a better chance to survive. They can pass on the marking or coloring to their own offspring. After many generations, the entire population has the useful trait.

► More to explore

Animal • Mimicry

Protestantism

With more than 400 million followers, Protestantism is the second largest branch of Christianity. Protestantism is divided into many different churches. The first Protestant churches broke away



Women serve as ministers in some Protestant churches. Other Protestant churches accept only men as ministers.

Did You Know?

Three leaders of the Reformation were Martin Luther, John Calvin, and King Henry VIII of England.

from Roman Catholicism, the largest branch of Christianity.

Beliefs and Practices

Although many Protestant churches have different beliefs, all Protestants reject Roman Catholicism and the power of its leader, the pope. They base their beliefs on the Christian Bible. Most believe that getting to heaven requires only faith in God, not any specific actions. They think that each believer, not just priests, can spread God's teachings.

Most Protestant churches hold worship services on Sundays. Protestants perform only two of the sacraments, or rituals, practiced by Roman Catholics: baptism and Communion.

History

In the 1500s some Roman Catholics began to disagree with their church. At first they wanted only to change, or reform, parts of the church. Their movement became known as the Reformation. But the leaders of Roman Catholicism strongly opposed such changes. Soon some people broke away to form new churches. Members of the new churches became known as Protestants. The first Protestant churches to form were the Lutheran church, the Church of England, and the Reformed, or Presbyterian, churches.

Catholics and Protestants fought wars over religion in the 1500s and 1600s. Protestantism remained strong, however, and spread throughout Europe and its colonies.

In the 1600s and 1700s some Protestants thought that Protestantism was still too close to Roman Catholicism. Some of them formed new Protestant groups, such as Congregationalists, Baptists, Quakers, and Methodists.

In the 1800s missionaries spread Protestantism further in the Americas, Africa, Asia, and Oceania. New Protestant churches continued to form in the 1800s and 1900s. Meanwhile, beginning in the 1900s, some Protestants worked to build unity with all Christians.

► More to explore

Bible • Christianity • Reformation
• Roman Catholicism

Protist

Protozoans, algae, and slime molds belong to a group of living things called



A layer of slime mold covers leaves and a wet log.

protists, or protoctists. Protists are not animals, plants, fungi, or bacteria. Many protists are so small that people can see them only through a microscope.

There are thousands of different species, or types, of protist. Many types live in water, both in oceans and in freshwater. Others live on land. Some, called parasites, live inside the bodies of animals. Some types are solitary—they do not form groups with other protists. Other types form groups called colonies.

Most protists are unicellular, which means that they have just one cell. Some protists are made up of clusters of cells. But a protist never has more than one type of cell.

Some protists act like animals. For example, some types of protozoan move around and feed on other living things. Other protists act more like plants. They make their own food through a process called photosynthesis, just as plants do. Many plantlike protists are called algae.

The protists called slime molds can act like animals or like fungi (such as mushrooms). Sometimes slime molds move around as unicellular creatures, as protozoans do. But at other times slime mold cells gather together. They form a slimy layer that moves across forest floors or other surfaces. This slime feeds on decaying plants and other living things. Sometimes small stalks grow out of the slime. The stalks release spores, as fungi

do. These spores are tiny units that turn into new slime mold cells.

► More to explore

Algae • Cell • Living Thing • Protozoan

Protozoan



The remains of a protozoan that lived long ago are preserved in rock as a fossil.

Protozoans are simple organisms, or living things. They belong to a group of organisms called protists, which are neither plants nor animals. Most protozoans are so tiny that they can be seen only with a microscope. Amoebas and paramecia are types of protozoan.

Protozoans are found all over the world, on land and in water. Protozoans living on land especially like moist soil. Some protozoans are parasites. They live inside the bodies of animals, including humans. Parasitic protozoans can cause disease.

A protozoan is just a single cell. But it can do all of the things that organisms with many cells can. A protozoan can

eat, grow, reproduce, and get rid of wastes. Most protozoans can move, too.

Protozoans have different shapes, but they all have some features in common. Like all cells, every protozoan is made up of a jellylike material called cytoplasm. Within the cytoplasm is at least one nucleus. The nucleus directs the functions of the cell. The cytoplasm also contains special organs that do certain jobs, such as digestion or making proteins. Some protozoans have hairlike or whiplike structures that help them move.

Most protozoans reproduce themselves without a partner. Usually the nucleus pinches in the middle to create two halves. The halves pull apart with equal amounts of cytoplasm to form two separate organisms.

► More to explore

Cell • Living Thing • Parasite • Protist

Providence



Population
(2000 census)
173,168;
(2007 estimate)
172,459

Providence is the capital of the U.S. state of Rhode Island. It lies at the head of Narragansett Bay, which is part of the Atlantic Ocean.



Big houses stand on a hillside in Providence, Rhode Island.

Providence is a busy seaport. It is also one of the main industrial centers in New England. It is among the region's leaders in the production of machinery, jewelry, and silverware. Government, health care, banking, and other services also bring money to the city. It is home to Brown University and several colleges.

The English settler Roger Williams founded Providence in 1636. He made the town a center of religious freedom.

Providence played an important role in the American Revolution. In 1775 the city had a protest called a tea party. People burned British tea to protest against taxes on tea. During the war many American troops lived in the city.

In 1854 both Providence and Newport became state capitals of Rhode Island. In 1900 Providence became the state's only capital.

► More to explore

Rhode Island

Prussia

Prussia was a historical region in Europe that bordered the southeast coast of the Baltic Sea. It was known for its powerful army. In 1871 Prussia united several German states to create the empire of Germany.

Beginnings

The first Prussians were tribes of hunters and cattle raisers. They were related to the Latvians and the Lithuanians. In the 1200s the Teutonic Order, a group of German-speaking knights, conquered the Prussians. The knights brought Christianity to the Prussians.

During the 1400s Poland and Lithuania defeated the Teutonic knights in a series of wars. Prussia was then divided into East Prussia and West Prussia. The king



Otto von Bismarck was the Prussian leader who created the modern country of Germany.

of Poland ruled the western part directly. He ruled the east through the Teutonic Order.

In 1526 the grand master of the Teutonic Order dissolved the order. He accepted Polish rule and changed East Prussia into the territory of a duke. The territory merged with another German state, called Brandenburg, in 1618.

Kingdom

In 1660 Frederick William of Brandenburg ended all Polish control over East Prussia. In 1701 Frederick William's son crowned himself as the first Prussian king, Frederick I.

Frederick I's grandson was Frederick II, who is known as Frederick the Great. He took West Prussia back from Poland in 1772. Under his rule, Prussia became a major power.

In 1848 some Prussians tried to start a revolution against King Frederick William IV. They wanted the people to have a say in the government. The king stayed in power, but he gave Prussia a constitution in 1850. The constitution created a parliament, or legislature. The people elected some of its members.

Empire

In 1862 Otto von Bismarck, a member of the Prussian parliament, gained a leading role in the government. He created a plan to bring Prussia and some other German states together as one German empire. In January 1871 the king of Prussia became Emperor William I of Germany.

Did You Know?

Frederick II also improved Prussia's educational system and supported the arts.

The End of Prussia

William II, also known as Kaiser Wilhelm, became emperor in 1888. He led Germany into World War I. Germany lost the war, and in 1918 the winners forced William II to give up his position. Germany became a republic—a country led by the people, not by a king. Prussia lost territory. It also lost power in Germany's government. By 1947, after World War II, Prussia no longer existed.

► More to explore

Frederick the Great • Germany

Psychology

Psychology is the scientific study of the ways that people think, feel, and behave. Like anthropology and sociology, psychology is called a social science. Scientists trained in psychology are called psychologists. Psychologists study the human mind and emotions to try to understand the reasons behind people's actions.



Some kinds of psychologists talk with people to help them deal with emotional problems.



The Rorschach test is one tool that psychologists use to learn about personality. The psychologist shows a person inkblots, and the person describes what they look like. Different kinds of people see different things in the inkblots.

There are several different branches of psychology. Clinical psychology is the largest branch. Clinical psychologists treat people with mental illnesses and emotional problems.

Psychologists who work in other branches of psychology do experiments and research. Some study what happens in the brain when people think and feel. Others study how people react to others. Certain psychologists compare the human mind to the minds of other animals, especially apes and monkeys.

To do their work, psychologists often observe, or watch, people. For example, a psychologist may observe children at play to see how they get along. Psychologists also may ask people to answer questions or to do different tasks. By comparing the actions and responses of many different people, psychologists hope to find patterns. These patterns

may help to explain why people think or act as they do.

► More to explore

Anthropology • Mental Illness • Social Science • Sociology

Pterodactyl

Pterodactyls were flying reptiles of prehistoric times. They lived about 145 to 65 million years ago, at the same time as the dinosaurs. Remains of pterodactyls have been found all over the world.

As far as scientists know, pterodactyls were the largest flying animals that ever lived. Some pterodactyls measured more than 36 feet (11 meters) across with the wings spread out. But the smallest pterodactyls were as small as a sparrow.

A pterodactyl's back legs were long and thin, like those of birds. Pterodactyls also had long beaks. But unlike birds, pterodactyls did not have feathers. Their wings were made of skin, like those of

bats. Pterodactyls probably did not fly by flapping their wings constantly. Instead they probably glided on air currents.

Pterodactyls were meat eaters. Many had hooked claws and sharp teeth that they used to grab and hold onto prey. Pterodactyls that lived near water fed mostly on fish. Pterodactyls that lived far from water ate small animals.

► More to explore

Dinosaur • Prehistoric Life • Reptile

Public Health

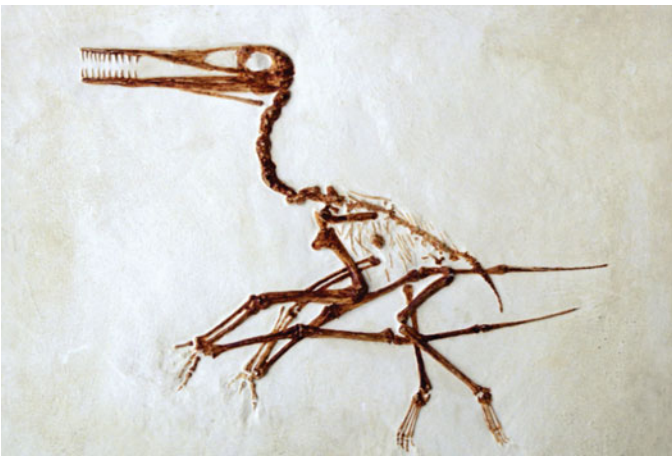
The term public health describes efforts to keep a whole community healthy. Local and national governments run many public-health programs. These programs improve living conditions and give people longer lives.

Public health includes many different health services. Some programs work to prevent and to fight disease. Vaccination is an important part of these efforts. A vaccine is a substance given to people to protect them from illness. Other programs focus on fighting pollution or keeping food and water safe. Public health also involves teaching people about exercise and healthy eating.

Public-health programs started to appear in the 1700s and 1800s. Before that, health was mostly a personal or local issue. But as the populations of cities and countries grew, the number of health problems grew, too. Governments began to see the need for keeping the

Did You Know?

Obesity, an extreme form of being overweight, has recently become a major public-health issue in the United States.



A fossil skeleton shows that pterodactyls must have looked like giant birds. But scientists do not believe that birds came from pterodactyl ancestors.



People wait in line to get flu shots. Such shots can prevent diseases from spreading to many people in a community.

public healthy. Today most countries have their own public-health programs. In the United States, the Department of Health and Human Services oversees many public-health agencies.

The World Health Organization (WHO) promotes the health of people around the world. It works to stop the spread of polio, AIDS, and other diseases. Its vaccination programs helped rid the world of smallpox. The WHO also warns travelers about diseases in certain countries.

► More to explore

Government • Vaccine

Pueblo

The Pueblo are a group of Native American tribes that live in northeastern Arizona and northwestern New Mexico. Early Spanish explorers gave them the name Pueblo, which is Spanish for “village” or “town.” The explorers were impressed by the villages that the Indians

had built. Today the term pueblo is used for both the people and their villages.

The Pueblo built large houses that had several stories, like apartment buildings. They used blocks of adobe, or sun-baked clay. The Pueblo got most of their food from farming. Their main crop was corn. Early Pueblo also hunted and gathered wild plants to eat.

The Pueblo are descendants of the ancient Anasazi people. Some of their villages were already hundreds of years old when Spanish soldiers arrived in 1540. The Spanish gave the Pueblo metal tools and cloth. They also brought horses and new crops such as wheat and chili peppers.

Later Spanish rulers were cruel to the Pueblo. In 1680 a Pueblo leader called Popé led a rebellion against the Spanish. The Pueblo drove the Spanish from their lands for 12 years. When the Spanish returned they had more respect for the Indians. Their rule was not as harsh.



A photograph from the early 1900s shows adobe houses built by the Zuni, a group of Pueblo Indians.

At the end of the 20th century there were about 60,000 Pueblo Indians. They lived in 19 pueblos. Unlike many other Indians, modern Pueblo have mostly been able to keep their traditional way of life.

► More to explore

Adobe • Anasazi • Native Americans

Puerto Rico



Puerto Rico is an island in the Caribbean Sea. It is a commonwealth of the United States. This means that Puerto Rico governs itself but keeps some ties with the United States. The capital of Puerto Rico is San Juan.

Puerto Rico is part of the island group called the West Indies. The island is roughly rectangular in shape. It is mostly mountainous, but the land along the coast is flatter. The weather is warm year-round.

Most Puerto Ricans have Spanish ancestors. People of African descent make up a smaller group. Some people have mixed European and African roots. Most Puerto Ricans speak Spanish, and

many speak English as well. Most of the people are Christian.

Puerto Rico's main sources of income are manufacturing, services, and trade with the United States. Factories make chemicals, medicines, electronics, machinery, and clothing. Finance and tourism are major service industries. Farms produce sugarcane, tropical fruits, coffee, beef, pork, chickens, milk, and eggs.

Arawak Indians known as the Taino arrived in what is now Puerto Rico by AD 1000. The first European to reach the island was Christopher Columbus. He claimed it for Spain in 1493. In the late 1700s the Spanish started to set up large farms called plantations. They brought in Africans to work on the plantations as slaves. Sugarcane, coffee, and tobacco were the major crops.

In 1898 Spain gave Puerto Rico to the United States after losing the Spanish-American War. In 1917 the U.S. government made the people of Puerto Rico



People celebrate a religious festival in Puerto Rico by putting on costumes and masks.

citizens of the United States. Puerto Rico became a commonwealth in 1951. Puerto Ricans have most of the benefits of U.S. citizenship. However, they cannot vote for the U.S. president.

► More to explore

Arawak • Caribbean Sea • San Juan
• Spanish-American War • United States
• West Indies

Pulaski, Casimir



Casimir Pulaski

Casimir Pulaski was born in Poland, but he became a military hero in the American Revolution. He stated his reasons for joining the revolution in a letter to General George Washington: “I came here, where freedom is being defended, to serve it, and to live or die for it.” He paid for his beliefs with his life.

Early Life

Pulaski was born on March 4, 1747, in Winiary, Poland. In his 20s he fought

against the Russians, who threatened his homeland. Pulaski later moved to France.

Pulaski met Benjamin Franklin in Paris, France, in December 1776. Franklin was looking for experienced volunteers to help fight for American independence from Great Britain. Pulaski agreed to help and sailed to America. He arrived in June 1777.

Military Career

During the American Revolution Pulaski impressed other soldiers with his skills as a cavalryman. A cavalryman is a soldier who fights on horseback. Pulaski showed great courage at the battle of Brandywine in Pennsylvania in September 1777. Pulaski led a cavalry charge against the British, who were winning. His actions allowed General Washington to escape with his troops.

In 1778 Pulaski formed a cavalry group known as the Pulaski Legion. The division included French, Irish, Polish, and German soldiers. Pulaski trained them in battle drills on horseback. He later became known as the Father of the American Cavalry.

Pulaski’s last battle was the battle of Savannah in 1779. On October 9, 1779, Pulaski was shot in the leg. He died two days later on a ship on its way to Charleston, South Carolina.

► More to explore

American Revolution • Washington, George

Puma



The puma is sometimes called the mountain lion because it is at home in the mountains.

The puma is a large cat of North and South America. It is also commonly called a mountain lion, cougar, or panther. It is about the same size as a jaguar. Its scientific name is *Puma concolor*.

Pumas live in a wide variety of habitats from southern Alaska to southern Argentina. Most of the pumas in North America live in the mountains of the western United States and Canada. Some pumas live in Florida.

Pumas can be up to 6 feet (1.8 meters) long, not including the tail. They stand about 2 to 3 feet (0.6 to 0.9 meter) tall at the shoulder and weigh about 80 to 220 pounds (36 to 100 kilograms). They may be yellowish tan, reddish brown, bluish gray, or some other color.

Pumas are powerful jumpers who attack their prey by leaping onto its back. From the ground, pumas can jump to heights of more than 18 feet (5.5 meters). Pumas mainly eat deer, but their diet also includes other small or medium-sized animals.

For many years people killed pumas because they sometimes attacked live-stock. Now pumas are protected in many places by laws that limit or ban hunting of the animals.

► More to explore

Cat • Jaguar

Pumpkin

Pumpkins are fruits that are commonly grown for food. The inside is cooked and eaten or used to make breads, soups, and pies. Pumpkins are related to squashes, gourds, cucumbers, and melons. Some types of pumpkin are called squashes.

Pumpkins are grown throughout North America and Europe. They grow on plants that have very long vines. The plant has rough, heart-shaped leaves and large yellow flowers.

Pumpkins usually weigh 9 to 18 pounds (4 to 8 kilograms). The largest varieties may weigh 75 pounds (34 kilograms) or more. Pumpkins are generally round.



Pumpkins grow on long vines.

But some may be flattened or stretched out on the top and bottom. The color is usually yellowish to orange. The rind, or skin, is smooth. Ridges run from the top to the bottom.

Pumpkins are picked in autumn. They can be stored for a few months in a dry place. In addition to using pumpkins in cooking, people roast and eat pumpkin seeds. They also feed pumpkins to animals. In some countries a carved pumpkin, called a jack-o'-lantern, is a familiar Halloween decoration.

► More to explore

Fruit • Gourd • Halloween • Squash

Purim

Purim is the most festive Jewish holiday. It is also called the Feast of Lots. The holiday celebrates a time when Jews in Persia (now Iran) escaped a plot to harm them. Purim usually falls in late February or early March.

In the 400s BC Haman, the Persian king's adviser, plotted to kill all the Persian

Jews. To choose a day for the killings, he drew lots (which means that he picked a day by chance). But the Persian queen, a Jewish woman named Esther, convinced the king to stop Haman. This story is told in the Book of Esther in the Bible.

On Purim Jews go to a synagogue and listen to a reading of the Book of Esther. Afterward family and friends have a festive meal. The celebration often includes acting out the story and playing games. People exchange gifts of food and give to the poor. They also eat pastries called hamantaschen, which means "Haman's pockets." The pastries are supposed to resemble Haman's three-cornered hat.

► More to explore

Judaism • Persia

Puritans

Puritans were people who wanted to "purify," or simplify, the Church of England. This church had broken away from Roman Catholicism during a period called the Protestant Reformation. However, the Puritans felt that the Church of England had kept too many Catholic practices. Some Puritans, called Separatists, formed their own churches. Others just wanted to change the existing church.

Many officials in England did not approve of the Puritans. The king and other English people often mistreated the Puritans. They called the Puritans "roundheads" because they wore their hair short instead of in long curls.



Children dance in Jerusalem to celebrate Purim.



An artwork from the 1500s shows a Puritan family. The Puritans lived simply, with little decoration in their clothing or homes.

Puritans in America

In 1620 a group of Puritan Separatists, now called the Pilgrims, left England to escape mistreatment. They crossed the Atlantic Ocean in a ship called the *Mayflower*. After reaching North America, they founded Plymouth Colony in what is now Massachusetts.

Several years later, another group of Puritans left England to find religious freedom. They set up the Massachusetts Bay Colony in 1630. Both of these groups eventually became known as Congregationalists.

Puritans in England

In England the Puritan spirit spread throughout society. Although the king disapproved of the Puritans, many of the common people shared their beliefs. Many leaders in Parliament also listened to the Puritans.

In 1642 civil war broke out between supporters of Parliament and the king.

King Charles was defeated and later executed in January 1649. The Puritan leader Oliver Cromwell became England's new leader. Cromwell's government favored the Puritans. Several new Puritan groups, including the Quakers, first appeared during this time.

Cromwell died in 1658, and a new king took power in 1660. Puritans were once again mistreated. This period was called the Great Persecution. Finally, in 1689 the Act of Toleration gave Puritans the freedom to practice religion as they thought it should be practiced.

► More to explore

Massachusetts Bay Colony • Plymouth Colony • Protestantism • Quaker

Did You Know?

The Pilgrims moved to Holland (now part of The Netherlands) before deciding to move to North America.

Pyongyang



Population
(2005 estimate), urban area,
3,351,000

Pyongyang is the capital of North Korea, a country in East Asia. The city lies on the Taedong River. It is North Korea's largest city. It is also a center of education and culture.

Pyongyang is a major center of industry. Factories in the city make fabric and clothes, food products, machines, chemicals, and other goods.



Young children file past a statue of North Korea's first leader, Kim Il-sung, in the city of Pyongyang.

According to legend, Pyongyang was founded in 1122 BC. It is said to have been built on the site of an even older capital.

The first historical records of Pyongyang are from 108 BC. It became the capital of the Koguryo kingdom of northern Korea in AD 427.

Pyongyang suffered several invasions over the years. In the 1890s it was damaged during a war between China and Japan. The Japanese controlled the city from 1910 to 1945.

In 1948 Korea was divided into two countries, North Korea and South Korea. Pyongyang became the capital of North Korea.

► More to explore

Korea, North • Korean War

Pyramid

A pyramid is a large structure with four sides that usually slope upward and meet

at a point. The base of a pyramid is a rectangle, and the sides are usually triangles. People throughout the world have built pyramids at different times. The most famous pyramids were built in ancient Egypt more than 4,500 years ago. The pyramids of Mexico, Central America, and South America are also well known.

Egypt

The pyramids of ancient Egypt were tombs. Egyptian kings had themselves buried with gold and other treasure. They had pyramids built partly to keep out people who would steal the treasure. However, robbers broke into most, if not all, of the Egyptian pyramids in ancient times. About 80 pyramids have been found in Egypt, but some are now only rubble.

The Egyptians developed pyramids from an earlier type of tomb called a mastaba. Mastabas were rectangular tombs with flat tops. In about 2650 BC King Djoser had his architect, Imhotep, build a new



The pyramids of Giza were one of the Seven Wonders of the World in ancient times. They are the only one of the seven still standing.

type of tomb. Imhotep stacked six stone mastabas, each smaller than the one beneath it. The result was a pyramid with a stepped design. Less than 100 years later King Snefru built the first pyramid with smooth, sloped sides.

The Great Pyramid was built for King Khufu in about 2550 BC. It sits in a group with two smaller pyramids in Giza, Egypt. About 100,000 workers spent about 20 years building the Great Pyramid. They stacked about 2.3 million blocks of stone to a height of 471 feet (143 meters). Each of the blocks weighed about 2.5 tons. The workers probably hauled them up a dirt ramp.

The Americas

Many ancient peoples of Mexico and Central and South America built pyramids. They usually used dirt and stone. These pyramids typically have a stepped form with a temple or platform on top. The Maya built a famous pyramid called the Castillo in what is now southeastern Mexico. The people of the ancient city of Teotihuacán, in central Mexico, built the Pyramid of the Sun and the Pyramid of the Moon.

► More to explore

Egypt, Ancient • Maya

Pyrenees

The Pyrenees mountain chain forms a high, rugged barrier between Spain and France. The mountains stretch for 270 miles (430 kilometers) from the Mediterranean Sea in the east to the Atlantic Ocean in the west.



Many of the mountains in the Pyrenees are more than 9,000 feet (2,740 meters) tall. The highest peak is Pico de Aneto, which rises 11,169 feet (3,404 meters).

Snow covers many of the peaks year-round, especially those in the center section of the chain. Ancient glaciers, or moving sheets of ice, carved valleys throughout the Pyrenees. There are also many mountain lakes and some of the highest waterfalls in Europe. Forests cover the mountain slopes in the west. Fewer trees and other plants grow in the east, which is much drier.

Few people live at the Pyrenees' highest elevations. However, the tiny country of



Cows graze in the Pyrenees in Spain.

Andorra is nestled among peaks near the eastern end of the chain.

Farmers and ranchers tend crops and raise animals in the valleys and on the slopes of the Pyrenees. Major crops include corn, potatoes, fruits, hay, olives, grapes, and cereals. Animals include beef cattle, sheep, and goats. Visitors come to the mountains for their hot springs, as well as for winter sports, hunting, fishing, and hiking.

Throughout history the Pyrenees have separated Spain from the rest of Europe. The mountains made it difficult to travel between the two by land. No one made good maps of the Pyrenees until the 1800s. For this reason the Spanish became excellent sailors. They also developed ties with North Africa, which is separated from Spain by only a short stretch of the Mediterranean Sea.

► More to explore

Andorra • Mountain

Python

Pythons are giant snakes of Africa, Australia, South and Southeast Asia, and the Pacific islands. Pythons are constrictors. This means that they kill their prey by wrapping themselves around it and squeezing it until it dies. Boas also constrict, but pythons and boas are different kinds of snakes.

There are about 28 species, or types, of python. They live in a variety of habitats, from forests to open, rocky areas. Many species live near water.



A green tree python coils around a tree branch in Indonesia.

One type, the reticulated python, is the world's longest known snake. It reaches a length of up to 32 feet (10 meters). Smaller pythons include the ball, or royal, python, which generally reaches a length of only about 6 feet (2 meters).

Pythons tend to strike their prey suddenly from a hidden position. They grasp the prey in their teeth and then kill the animal by squeezing it to death. Large pythons generally eat small mammals and birds. Smaller pythons also eat amphibians and reptiles. After eating a large meal, a python may not need to eat again for weeks or even months.

Like most other snakes, pythons reproduce by laying eggs. After the female lays her eggs she coils herself around them until they hatch about two or three months later.

► More to explore

Boa Constrictor • Snake

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The rich country of Qatar was once a land of wandering herders and small fishing villages.

(See Qatar.)

Members of the Society of Friends, a Christian group, are called Quakers.

(See Quaker.)

Workers use machinery and explosives to take stone from a quarry. The stone may be taken in big blocks or in small pieces.

(See Quarrying.)

More than 80 percent of the people of Quebec, a Canadian province, speak French as their usual language.

(See Quebec.)

The Australian state of Queensland is nicknamed the Sunshine State.

(See Queensland.)



Qatar

Qatar is a small country in the Middle East. It is an emirate, a country ruled by a leader called an emir. The capital is Doha.

Geography

Qatar sits on a small peninsula on the eastern coast of Saudi Arabia. The Gulf of Bahrain and the Persian Gulf lie to the north, east, and west.

Qatar's land is mainly a low, flat desert. The weather is hot during the summer and warm the rest of the year.

Plants and Animals

Desert grasses and shrubs grow in Qatar's dry environment. Animals include geckos, desert hares, jumping rodents called jerboas, and many birds.

People

Most of the people who live in Qatar are immigrants. They came from other Arab countries, as well as Pakistan, India, and



Most men in Qatar wear traditional clothing. The long white shirt is called a *thobe*. A *ghutra* is a headdress made of cloth and held in place with a black rope.

Iran. Arabic is the main language. Most people are Muslims.

Economy

Qatar is a rich country because of its reserves of oil and natural gas. The country also produces chemicals and steel. Banking is important to the economy as well. Qatar's few crops include dates, melons, and tomatoes. Herders raise sheep, goats, and camels.

History

For centuries Qatar was a land of nomads (wandering herders) and small fishing villages. In 1868 the al-Thani family gained power.

In 1916 Great Britain took control of Qatar's foreign affairs. Qatar gained independence from Britain in 1971. Emirs from the al-Thani family ruled Qatar into the 21st century.

► More to explore

Doha • Middle East

Facts About QATAR



Population
(2008 estimate)
1,448,000

Area
4,412 sq mi
(11,427 sq km)

Capital
Doha

Form of government
Constitutional emirate, or kingdom

Major cities
Ad-Dawhah (Doha),
Ar-Rayyan,
Al-Wakrah, Umm Salal



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Quaker

Members of the Christian group known as the Society of Friends are called Quakers. They are dedicated to experiencing God personally rather than through clergy, such as priests or ministers. Quakers call the presence of God inside each person the “Inner Light.” They believe that the Inner Light guides them through life.

Practices

Quakers attend meetings to worship God. These meetings are open to everyone. The worshippers sit in silence, waiting for a message from God. Worshipers who hear a message share their thoughts with the others.

Quakers have a long tradition of working for peace and opposing war. They also oppose slavery, cruel treatment of

prisoners, and unfair treatment of women. Various Quaker groups organize relief and service projects throughout the world.

History

George Fox, an English preacher, founded Quakerism in the mid-1600s. He grew to believe that God could be found inside people rather than in church ceremonies. He and other preachers established groups that shared his beliefs. These groups later became the Society of Friends. Its members were called Quakers because many worshippers quaked, or trembled, with emotion during religious meetings.

The Quakers offended many Christian leaders because they refused to honor officials, take oaths, or pay for the upkeep of English churches. Government authorities fined some of the Quakers, took their property, and put them in prison. The Quakers flourished nevertheless. A law passed in 1689 granted freedom of worship to the Quakers and other groups in England.

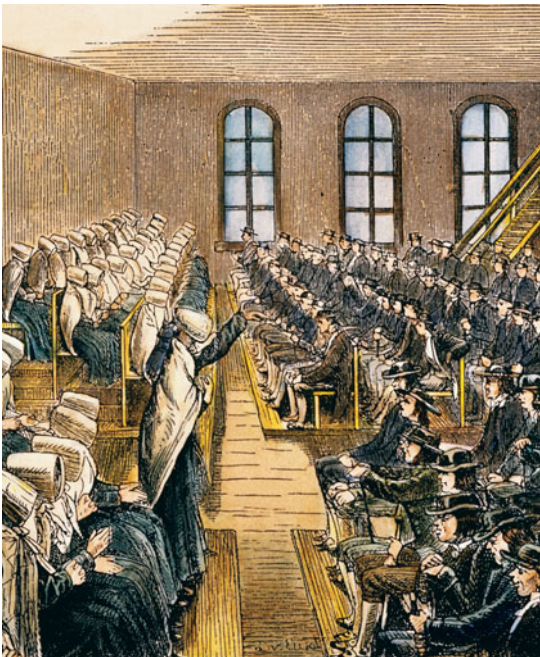
At the same time some Quakers traveled to the North American colonies. In 1681 King Charles II of England gave a Quaker named William Penn land that became the colony of Pennsylvania. Many Quakers settled there. In the 1800s Quakers in the United States founded several colleges and universities that emphasized science. In the 1900s Quakerism spread to Africa and Europe.

► More to explore

Christianity • Penn, William

Did You Know?

Quaker service groups in the United States and Great Britain shared the Nobel peace prize in 1947.



Quaker worship services are called meetings. A drawing shows a meeting that took place in the 1800s.

Quapaw

The Quapaw are Native Americans who once lived in eastern North America, along the coast of the Atlantic Ocean.

They later moved westward along with other related tribes, including the Osage, the Kaw, the Omaha, and the Ponca.

The Quapaw eventually settled in what is now Arkansas. The tribe itself is sometimes called the Arkansas.

The Quapaw lived in rectangular, bark-covered homes called longhouses. Longhouses were big enough to house several families. The Quapaw grew corn, gourds, pumpkins, sunflowers, beans, and squash. They also hunted such animals as bison (buffalo) and gathered nuts and berries.

In 1673 French explorers visited Quapaw lands. The French and the Quapaw became trading partners. But the French also brought diseases, such as smallpox and measles, that killed many Quapaw.

American settlers soon arrived in the area. In the early 1800s the U.S. government got the Quapaw to give up their

Arkansas lands. The Quapaw went to live among the Caddo Indians in Louisiana. However, floods soon drove them from their new home.

In 1833 the Quapaw moved to a reservation in Indian Territory (now Oklahoma). In the 1920s some Quapaw became wealthy because they were able to mine and sell lead and zinc found on reservation lands. At the end of the 20th century there were about 1,000 Quapaw living in the United States.

► More to explore

Kaw • Native Americans • Omaha
• Osage • Ponca

Quarrying

Mining is the removal of minerals from Earth's crust. Quarrying is the mining of stone, or rock used mainly for building. A quarry is a hole or a pit in the ground from which workers remove stone. During quarrying, workers cut or blast stone into smaller pieces. These smaller pieces of stone are easier to handle and can be used to make many things.



A Quapaw sash is decorated with colorful beads.



Many different machines, including trucks and cranes, are used in quarries.

Types of Quarried Stone

There are two basic types of quarried stone: dimension stone and crushed stone. Dimension stone is blocks or slabs (big rectangles) of stone that have been cut to a certain size. Granite and limestone are popular types of dimension stone. Crushed stone is much smaller than dimension stone. It is stone that has been broken into many small pieces.

How Quarrying Is Done

Workers take stone from a quarry by cutting, drilling, or blasting it. To get dimension stone, they use machinery that cuts or drills large pieces of stone off the walls of the quarry. Each long, heavy slab weighs thousands of pounds. Workers cut the slabs into smaller blocks before transporting them to the surface. To get crushed stone, workers use explosives to blast stone from the quarry's walls.

In ancient times people removed stone from quarries without the help of modern machines or explosives. For instance, the ancient Egyptians used such tools as picks, wedges, drills, and saws.

Uses of Quarried Stone

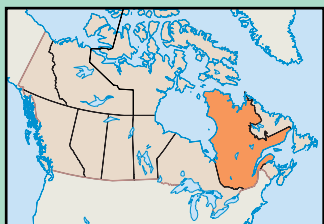
The ancient Egyptians quarried huge blocks of stone to build pyramids. The ancient Greeks and Romans created many buildings and sculptures with quarried stone, as did later peoples. Today businesses all over the world use quarried stone, and almost every country has quarries. People still use dimension stone to make buildings, monuments, and sculptures. They use it to build bridges, tunnels, and dams as well. People use crushed stone mostly to build roads and to make concrete.

► More to explore

Mining • Rock



A worker at a quarry cuts slabs of limestone into smaller blocks.



Quebec

The province of Quebec is different from the rest of Canada. The language and traditions of most of its people are French rather than English. The name Quebec comes from an Algonquian Indian word meaning “where the river narrows.” It was first used for the province’s capital, Quebec city, which is located at a spot where the Saint Lawrence River narrows.

Geography

Quebec is Canada’s largest province in area. It borders Ontario and Hudson Bay on the west. The Hudson Strait lies to the north. To the east are the Gulf of Saint Lawrence and the mainland part of Newfoundland and Labrador. To the south are New Brunswick and the U.S. states of Maine, New Hampshire, Vermont, and New York.



Most of Quebec’s people live in the lowlands near the Saint Lawrence River and in the region south of the river, which is part of the Appalachian Mountains. The Laurentian Mountains, north of the lowlands, are the oldest mountain range in the world. The rocky land north of the Laurentians has many forests, lakes, and rivers. In the far north, near Hudson Bay and Hudson Strait, are barren Arctic lands.

People

Most of Quebec’s people are of French origin. More than 80 percent speak French as their usual language. After the French, people of British descent are the most numerous. Other ethnic groups include Irish, Italians, Haitians, Chinese, Greeks, and American Indians.

Nearly half of Quebec’s people live in Montreal or its suburbs. Located on an island in the Saint Lawrence River, Montreal is the second largest city in Canada after Toronto.

Economy

Services and industry are the most important parts of Quebec’s economy. Most of the province’s workers are employed in such services as tourism, education, banking, real estate, and sales. The next largest group works in manufacturing. Factories in the province produce food and drinks, aircraft and other transportation equipment, electrical goods, chemicals, and paper. Quebec’s mines provide gold, copper, zinc,



Street signs in Quebec are mostly in French.

iron ore, and asbestos. River dams create electricity, which Quebec exports to other provinces and to the United States.

Most farming in Quebec is done in the south, near the Saint Lawrence River. The province leads all others in dairy farming. Quebec is also among the leading provinces in poultry, hog, and vegetable production. Maple sugar is a Quebec specialty.

History

The first people in what is now Quebec were American Indians and Inuit. Indian groups included the Iroquois, the Huron, and the Cree.

In 1534 the French explorer Jacques Cartier sailed up the Saint Lawrence River and claimed the lands he saw for his country. The region was called New France. In 1608 Samuel de Champlain

founded Quebec city. Montreal was founded in 1642.

The French turned New France over to the British in 1763, after losing the French and Indian War. The British renamed the land Quebec. In 1791 the British split Quebec into two parts: Upper and Lower Canada. Lower Canada was later renamed Canada East.

Canada East became the province of Quebec in 1867. It was one of four original provinces in the new country of Canada. Upper Canada became the province of Ontario.

Quebec's borders changed in the early 1900s. Ungava, a huge region between Hudson Bay and the Hudson Strait, became part of the province in 1912. But the province lost land to Newfoundland (now Newfoundland and Labrador) when a boundary line was drawn in 1927.

Quebec's French Canadians have not always gotten along well with Canada's English-speaking majority. In the 1960s some people in Quebec began to demand that Quebec become a separate country. In 1976 Quebec voters elected a government dedicated to independence. However, in 1980 and again in 1995 the people voted for Quebec to remain part of Canada.

► More to explore

Canada • Cartier, Jacques • Champlain, Samuel de • French and Indian War • Saint Lawrence River and Seaway

Facts About QUEBEC

Flag



Population

(2006 census)
7,546,131

Area

595,391 sq mi
(1,542,056 sq km)

Capital

Quebec city

Motto

Je Me Souviens (I Remember)

When Quebec Became a Province
1867

Queensland



Queensland is the second largest of Australia's six states. (Western Australia is the largest.) Queensland is known for its sandy beaches, damp rain forests, open plains, and rugged highlands. Its tropical climate has earned it the nickname Sunshine State. Brisbane is the capital.

Geography

The Pacific Ocean borders Queensland on the north and the east. The state of New South Wales lies to the south, and the state of South Australia lies to the

southwest. The Northern Territory forms the western border of Queensland.

Mountains that rise 2,000 to 5,000 feet (600 to 1,500 meters) line Queensland's coast. A mountain range called the Great Dividing Range separates the eastern third of Queensland from the western part. The western part of the state is mostly dry plains. Dense rain forests of palms, pines, and other plants grow on the eastern coast. Off the coast of Queensland is the world's largest coral reef, called the Great Barrier Reef.

People

More than 3.5 million people live in Queensland. Most Queenslanders can trace their family history to Europe. A small number of people are Australian Aborigines. People from Southeast Asia, especially Vietnam, also have settled in Queensland.

More than 40 percent of Queensland's people live in Brisbane, in the southeastern corner of the state. This big city is a port on the Pacific Ocean.

Economy

Farming and mining are important to Queensland's economy. The main farm products are beef, sugarcane, wheat, and wool. Other crops include sorghum, corn, pineapples, and bananas. Queensland's mines produce coal, copper, silver, zinc, and lead.

Tourism also brings money to the state. Tourists come for the warm climate and sandy surfing beaches. Many visit the Great Barrier Reef and the rain forests.



Queensland is home to many animals. Kangaroos sometimes hop across roads, so people must drive carefully.

History

Aborigines have lived in what is now Queensland for at least 40,000 years. European explorers visited the area in the late 1700s and early 1800s. In 1824 Great Britain set up prison camps in what is now Queensland. Britain shipped many prisoners to these camps, which existed until 1840.

Free British settlers began to build settlements in the area in the early 1840s. At first Queensland was a part of the colony of New South Wales. In 1859 Queensland became a separate colony. The population soared after gold was discovered in the late 1850s. Many miners went to Queensland in the hope of striking it rich.

In 1901 Australia became independent from Britain. At the same time Queensland became a state of Australia.

► More to explore

Australia • Great Barrier Reef

Quito



Quito is the capital of Ecuador, a country in northwestern South America. The city sits on the slopes of the Pichincha



Spanish-style buildings surround a plaza in Quito, Ecuador.

volcano, in the Andes Mountains. It is a center of education, culture, and business.

Ecuador's major oil pipelines pass through Quito. Banking, tourism, and other service industries are important to the city's economy. Factories in Quito make cloth, medicines, and metal and wood products.

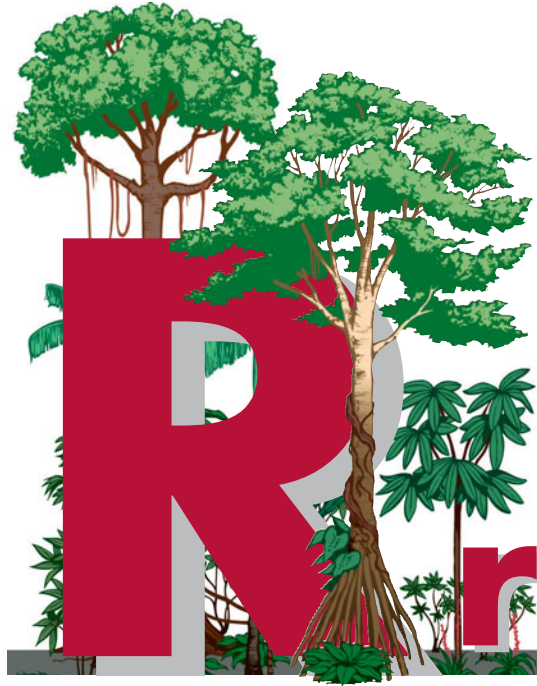
Quito is the oldest capital in South America. In ancient times it was the center of the kingdom of the Quito Indians. The Cara Indians took over the area in the 900s. In 1487 the city became part of the Inca Empire. Spain ruled the region from the 1500s to the early 1800s. In 1830 Ecuador became an independent country with Quito as its capital.

► More to explore

Ecuador

Qur'an

► see Koran.



Raccoons live high in hollow trees or at the tops of buildings in cities.

(See Raccoon.)

A tropical rain forest has three sections: the canopy made by the treetops; the understory, where smaller plants grow; and the forest floor.

(See Rain Forest.)

The ancient Egyptians believed that at sunrise the god Re—the sun—began a journey across the sky in his boat.

(See Re.)

Recycling reduces the amount of paper, glass, plastic, and other materials that people throw away.

(See Recycling.)

Sally Ride was the first U.S. woman to travel into outer space.

(See Ride, Sally.)

Ra

► see Re.

Rabat



Population
(2004
estimate), urban
area,
1,622,860

Rabat is the capital of Morocco, a country in northern Africa. The city lies where the Bou Regreg River flows into the Atlantic Ocean.

Industries that provide services, such as banking and trade, are important to Rabat's economy. Many people work for the government. Factories in the city produce cloth, food products, and bricks. Craftspeople in Rabat make carpets and leather goods.

In ancient times the Romans created a colony in the Rabat area. In the 1100s the Muslim rulers of Morocco founded Rabat as a military camp. In the early 1600s Spain's rulers forced all Muslims to leave Spain. Many of them moved to Rabat and the nearby city of Salé. Later in the 1600s the area was a base for pirates. The pirates attacked ships off the coast of northern Africa.

In 1912 the French took control of most of Morocco. They made Rabat its capi-



Walls surround the oldest part of the city of Rabat. The walls were built hundreds of years ago to protect the city from invaders.

tal. In 1956 Morocco became an independent country with Rabat as its capital.

► More to explore

Morocco

Rabbit and Hare

Rabbits and hares are mammals with long ears. There are about 28 species, or types, of rabbit and about 30 species of



The jackrabbits of North America are actually hares.

hare. They all belong to the same animal family, called Leporidae. Because rabbits and hares look similar, people sometimes confuse them.

Where Rabbits and Hares Live

Different species of rabbit and hare live in different habitats around the world. Cottontails and jackrabbits live wherever they can find brushy shelter. Other types can be found on mountains, on plains, in marshes or swamps, and even in the snowy Arctic.

Physical Features

Both rabbits and hares have short tails. They also have large eyes, strong teeth, and sensitive noses. The upper lip is split.

Hares are usually larger and heavier than rabbits. Hares measure from 16 to 28 inches (40 to 70 centimeters) long. Rabbits may be from 8 to 20 inches (20 to 50 centimeters) long. In general, hares also have bigger ears and longer hind feet than rabbits.

The fur of hares and rabbits is often gray-brown in color. Many hares turn

white in the winter. Rabbits' coats are the same color year-round.

Behavior

Many rabbits and hares live alone. Some rabbits live together in underground burrows called warrens.

Rabbits and hares eat mostly plants. They can cause great damage to gardens and crops. Their natural enemies are flesh-eating birds, mammals, and reptiles. Rabbits and hares use their speed and jumping ability to escape from these predators.

Reproduction

Female hares may have two to three litters of babies each year. The newborns have open eyes and can hop within minutes. They can take care of themselves after only a few days.

Female rabbits also may have several litters each year. Newborns are blind and helpless. They stay with their mother for about three weeks.

► More to explore

Mammal



Many kinds of rabbits dig burrows, or holes, for shelter.

Raccoon

Raccoons are mammals of the Americas. They can be found in cities as well as in the countryside. There are seven species, or types, of raccoon. The most common is the North American raccoon.

The North American raccoon can be found in Canada, the United States, and



Shaggy fur keeps a raccoon warm in the winter.

South America. It prefers wooded areas near water, but it will live in other areas, including large cities.

Raccoons have short legs, pointed muzzles, or snouts, and small ears that stand straight up. Their small feet resemble slender human hands. North American raccoons are 30 to 36 inches (75 to 90 centimeters) long from the nose to the tip of the tail. They weigh about 22 pounds (10 kilograms). A large male can weigh more than 44 pounds (20 kilograms).

Raccoons have a pattern of dark fur around their eyes that looks like a mask. They also have bushy tails that have dark bands, or rings. Their bodies are covered with shaggy, coarse fur that is iron-gray to blackish in color. They are nocturnal omnivores, which means they are active at night and eat both plants and animals. Raccoons eat crabs, frogs, fishes, rodents, fruit, and plants, including crops. In cities they tend to eat garbage or anything else they can find.

Raccoons live high in hollow trees or at the tops of buildings in cities. In captivity raccoons can live up to 20 years, but most do not live more than 5 years in the wild. Many are killed by humans for their fur or because they are considered pests.

► More to explore

Mammal

Radar

Radar is a system that uses waves of energy to sense objects. It can find a faraway object and tell how fast it is moving. Radar is very useful because it can sense objects even at night and through thick clouds.

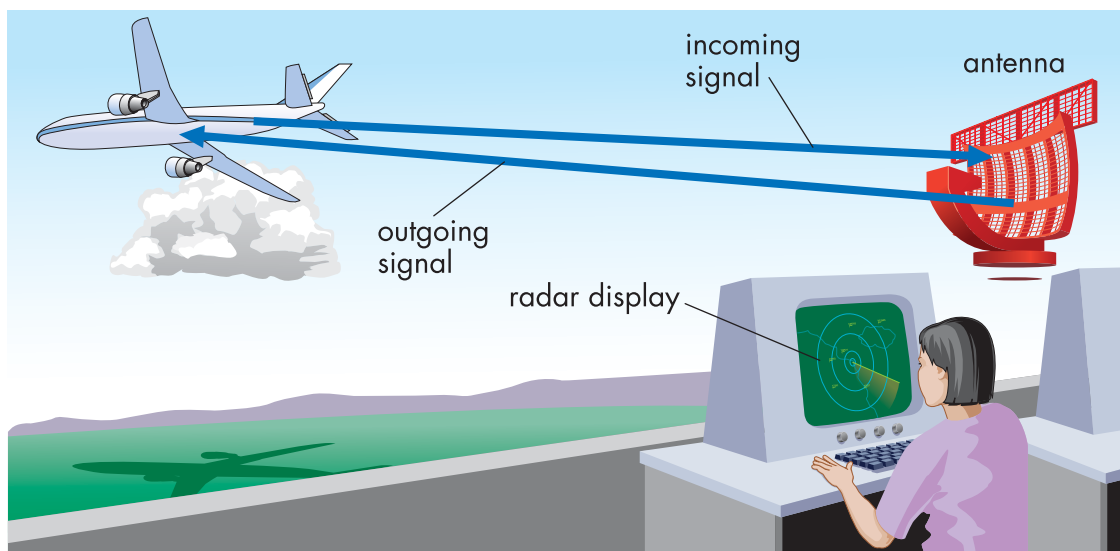
How Radar Works

A radar system is made up of a transmitter, a receiver, an antenna, and a display. The transmitter creates radio waves, which are invisible streams of energy. The antenna sends the waves out into the air. When the waves hit an object, they reflect, or bounce back, to the antenna.

The waves then pass to the receiver, which makes sense of them. By measuring how long it takes the waves to return, the receiver can tell how far away the object is. The receiver can also tell where a moving object is headed and at what speed. Sometimes it can tell how big the object is, too. The receiver sends this information to a display, or screen, for people to see.

Did You Know?

The word radar is short for radio detection and ranging.



In a radar system, an antenna sends out radio waves. The waves hit an object and bounce back to the antenna. A radar display then tells a person information about the object's distance, direction, and speed.

Uses

Radar is very useful. At airports, air-traffic controllers use radar to keep track of airplanes and direct their movements. Ships and airplanes use radar to navigate, or find their way. Militaries depend on radar to find and track targets. Weather forecasters use it to locate storms and help predict the weather. Police use radar to spot speeding automobiles. Radar can also be used to find buried objects.

History

Work with radar started in the 1930s. A Scottish scientist named Robert Watson-Watt developed a radar system in 1935. It was used to help protect Great Britain from air attacks. During World War II (1939–45) radar helped Britain, France, and the United States defeat Germany. Since then many improvements have been made in radar technology. Today computers help radar

systems provide more details about distant objects.

► More to explore

Weather

Radiation

Radiation is energy that moves from one place to another. Light, sound, heat, and X-rays are examples of radiation. The different kinds of radiation fall into a few general categories: electromagnetic radiation, mechanical radiation, nuclear radiation, and cosmic rays.

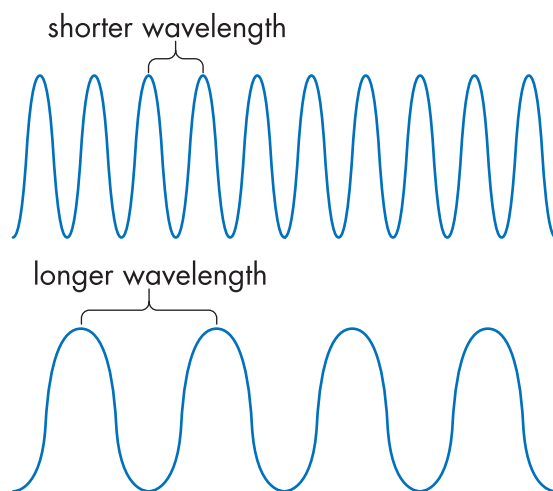
Electromagnetic Radiation

Electromagnetic radiation comes from atoms, the building blocks of all matter. Some of the particles that make up atoms have an electric charge. The motion of these charged particles produces energy that can be described as traveling as waves. These waves combine electricity and magnetism. They can

travel through empty space, like in outer space. They can also travel through air and even solid substances, such as glass. Through empty space, the waves travel at a speed of about 186,282 miles per second (299,792 kilometers per second).

Like all waves, electromagnetic waves have peaks and valleys. The distance from the peak of one wave to the peak of the next wave is called a wavelength. Different kinds of electromagnetic waves have different wavelengths.

From longest to shortest wavelength, the types of electromagnetic radiation are radio waves, infrared rays, visible light, ultraviolet rays, X-rays, and gamma rays. Radio waves are used for sending signals, including television and radio broadcasts. Microwaves are short radio waves that can be used to cook food in microwave ovens. Infrared radiation, or heat, is given off by warm objects. Infrared radiation from the sun



Electromagnetic radiation travels in waves. A wavelength is the distance from the peak of one wave to the peak of the next wave. Short wavelengths have a shorter distance between peaks than long wavelengths.

heats Earth. Visible light is all the wavelengths of electromagnetic radiation that the human eye can see. Different wavelengths of visible light are seen as different colors. Ultraviolet radiation is used by the skin to make a nutrient called vitamin D. X-rays are used to make a picture of something inside an object, such as bones inside the body. Gamma rays are used in medicine to kill cancer cells.

The shorter the wavelength, the more energy the radiation carries. The types with the most energy—ultraviolet radiation, X-rays, and gamma rays—can be harmful to the body.

Mechanical Radiation

Unlike electromagnetic radiation, mechanical radiation cannot travel through empty space. It can travel only through a substance, such as air, water, or solid objects. A common example of mechanical radiation is sound. Sound is produced by the back-and-forth motion of a vibrating object. This motion produces sound waves that travel away from the object. Sound travels more slowly than light does. This is why during a storm, the sound of thunder follows a flash of lightning. An earthquake produces another form of mechanical radiation. The shock waves created by an earthquake travel through Earth and cause the ground to shake.

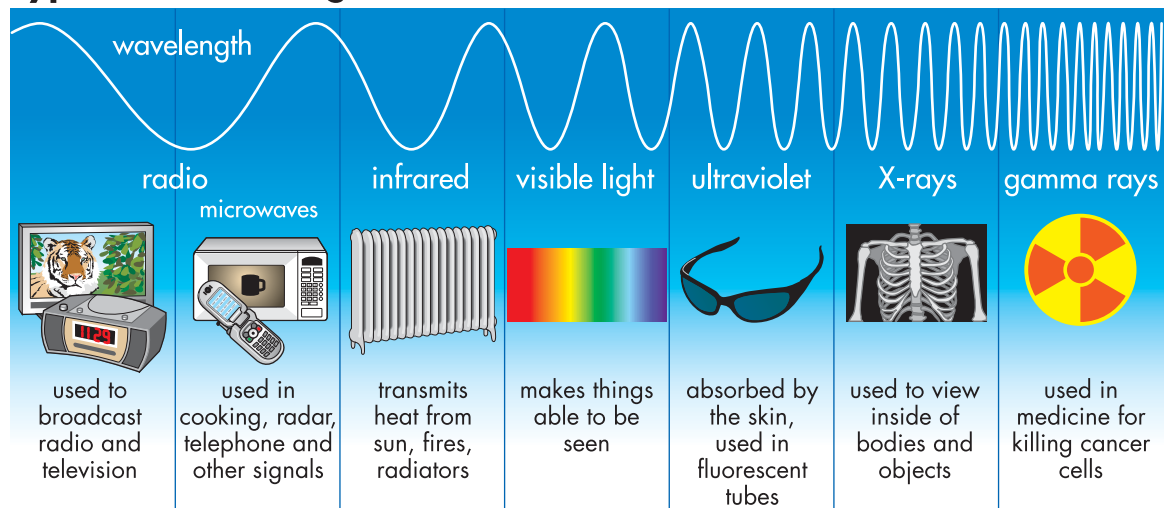
Nuclear Radiation

Nuclear radiation comes from the nucleus, or center, of atoms. It is produced when the nucleus changes in some way. The nucleus of some types of

Did You Know?

By sending sound waves through the body, doctors can check on the health of a growing baby inside its mother.

Types of Electromagnetic Radiation



Radio waves, infrared rays, visible light, ultraviolet rays, X-rays, and gamma rays are all types of electromagnetic radiation. Radio waves have the longest wavelength, and gamma rays have the shortest wavelength.

atoms is unstable. An unstable nucleus can naturally change into another type of nucleus. When it does this, it shoots off nuclear radiation in the form of small particles or gamma rays. Atoms that give off radiation in this way are called radioactive. Nuclear radiation carries a lot of energy, so it can be dangerous.

Cosmic Rays

Cosmic rays are a type of radiation made up of tiny parts of atoms that speed through outer space. Cosmic rays can come from the sun, but most come from farther away in the galaxy. Some cosmic rays travel almost at the speed of light. Because they move so fast, they have very high energy. Scientists study cosmic rays to learn more about the makeup of the galaxy.

► More to explore

Atom • Energy • Heat • Light • Nuclear Energy • Radio • Sound • X-rays

Radio

Radio is a way of sending sounds or other information through the air. The information is carried by invisible radio



Dish antennas pick up radio waves that carry many kinds of communication.

waves. Radio waves are used for broadcasting, or sending out, radio and television programs. Radar, cell phones, cordless telephones, wireless computer networks, and other forms of communication use radio waves, too.

How Radio Works

Radio waves are a type of radiation. Radiation is energy that moves. Like all waves of radiation, radio waves have a property called frequency. Frequency describes the number of waves that pass a given point each second.

Radio waves are sent out by a device called a transmitter. The transmitter turns talking, music, pictures, or other information into electric signals. The transmitter combines these electric signals with radio waves of a certain frequency. The waves spread out in all directions from an antenna connected to the transmitter.

The radio waves are picked up by an antenna connected to a device called a receiver. The receiver separates the electric signals from the radio waves. Then it turns the electric signal back into the original sounds or pictures.

A receiver that picks up waves that carry sound is called a radio. A radio sends the electric signal through speakers so the sound can be heard. Each radio station sends out radio waves of a certain frequency. A person changes a radio from one frequency to another to hear different stations.



Families of the 1930s had no television to watch. Instead, they gathered around the radio to listen to their favorite programs.

History

In the late 1890s several people began working on ways to send and receive electric signals using radio waves. An Italian scientist named Guglielmo Marconi got much of the credit for developing radio. In 1897 he started a company that developed several uses for radio.

The first radio station started broadcasting in Pittsburgh, Pennsylvania, in 1920. Within two years hundreds of radio stations were started. Radio was a major source of home entertainment until the mid-1950s. Then television became more popular.

In the early 21st century satellite radio got many people interested in radio again. Satellite radio was a new method of radio broadcasting. Instead of using antennas on the ground, satellite radio stations sent broadcasts from satellites, or spacecraft. Satellite radio stations provided crisp, clear sound. They also

could be heard over a much wider area than traditional radio stations could.

► More to explore

Electronics • Marconi, Guglielmo
• Radar • Radiation
• Telecommunication • Telephone
• Television

Railroad

A railroad, also called a railway, is a type of land transportation. In a railroad a train travels along a path of two metal rails, or tracks. A train is a row of wheeled cars that are linked together. The wheels of rail cars have a rim that keeps them on the rails.

A vehicle called a locomotive pulls most trains. A locomotive can be powered by an engine that burns diesel fuel or by electricity. The electricity comes from a third rail or an overhead wire. The train

operator, called the driver or engineer, usually sits in the locomotive.

Types of Trains

Trains can be divided into two types: passenger and freight. Passenger trains carry people. Freight trains carry goods.

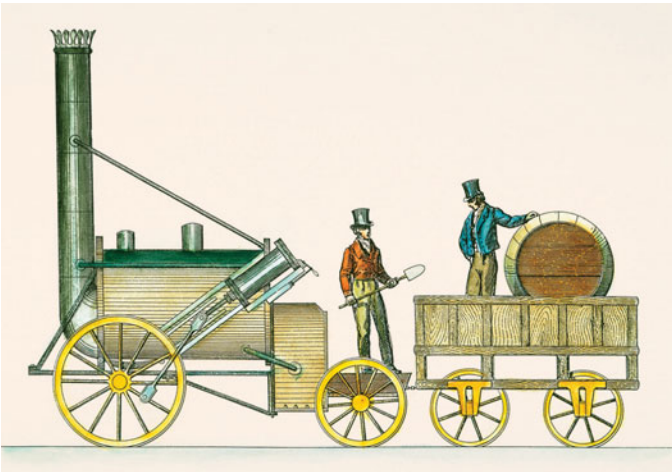
Passenger trains have cars with seats. Many passenger trains also have dining cars, baggage cars, and even sleeping cars with beds. The speed of many large passenger trains is about 100 miles (160 kilometers) an hour. However, some trains in Europe and Japan can go more than 180 miles (290 kilometers) an hour.

Commuter trains (trains that carry workers into a city), subways (underground trains), and monorails (trains that run on one rail) are smaller passenger trains. They carry people shorter distances. These trains often do not have a separate locomotive. Instead, some or all of the cars have electric motors under the floor. The train operator sits in the front car.

Freight trains consist of locomotives and freight cars. There are many types of freight cars. Boxcars often carry packaged goods. Open hopper cars often carry coal. Covered hopper cars often carry grain. Tank cars carry liquids. Car carriers carry automobiles. Special flatcars carry trailers or freight containers. Some freight trains have 150 or more cars. Because they pull so much weight, freight trains usually move more slowly than passenger trains.



High-speed trains leave their station in London, England. They can go all the way to France through a railway tunnel that runs under the English Channel.



George Stephenson of England built the *Rocket* with his son, Robert, in 1829. It was the fastest steam locomotive of its time, with a speed of 36 miles (58 kilometers) per hour.

History

Before there were trains and locomotives, people used horses to pull carts along tracks. Europeans began using this early type of railroad in the 1500s. They used it to carry heavy loads to and from mines.

In 1803 Richard Trevithick, a British engineer, planned and built a locomotive that ran on steam power. Mining companies used it. In the 1820s another British inventor, George Stephenson, designed and built the first steam train to carry goods and passengers.

In 1869 the United States completed a railroad system that stretched all the way from the East Coast to the West Coast. This railroad was called the transcontinental railroad.

Between the 1930s and the 1950s, diesel engines replaced steam engines as the power source in most locomotives. Today freight trains operate throughout

the world. But in many countries trucks carry much of the freight that trains once did. Passenger trains are still common, too. However, airlines have taken passengers away from many railroads.

► More to explore

Transportation

Rain

Water has three forms. It may be a liquid, a solid called ice, or a gas called water vapor or steam. Rain is the liquid form of water that falls from the sky in drops.

Rain fills lakes, ponds, rivers, and streams. It provides the freshwater needed by humans, animals, and plants. If too much rain falls, however, dangerous flooding may happen.

How Rain Forms

Rain is a part of Earth's endless water cycle. At the beginning of the cycle, sunlight heats up water on Earth's surface. The heat causes the water to evaporate,



A tree frog enjoys the rain.

Did You Know?

The more rain-drops a cloud contains, the darker it becomes.

or to turn into water vapor. This water vapor rises into the air. As the water vapor cools, it turns back into water, in the form of droplets. The droplets form around dust and other particles through a process called condensation.

Clouds form from large numbers of these droplets. In a cloud, droplets come together with other droplets to form larger drops of water. Eventually the drops become too heavy to stay in the cloud. They fall to Earth as rain. Then the water cycle begins again.

Sometimes drops of water freeze into ice crystals in the clouds. Sometimes the ice crystals melt as they fall toward the ground. This is another way that rain forms.

Where Rain Falls

Rain falls almost everywhere on Earth. One of the world's rainiest places is Mount Waialeale in Hawaii. It rains about 350 days a year there. About 460 inches (1,170 centimeters) of rain fall there every year. One of the driest places on Earth is the Atacama Desert in Chile. It receives less than 0.04 inch (0.1 centimeter) of rain a year. It has not rained in some parts of this desert in hundreds of years.

Acid Rain

Rain washes dust and dirt from the air. But rain itself is not always pure. Sometimes polluting chemicals from cars, factories, and power plants become trapped in clouds. The rain from these clouds contains those harmful chemicals. This polluted rain, known as acid

rain, can damage plants, animals, people, and property.

► More to explore

Acid Rain • Cloud • Flood • Water

Rainbow

A rainbow is a multicolored arc, or curved line, in the sky. Most rainbows form when the sun's rays strike rain-drops falling from faraway rain clouds. Rainbows appear in the part of the sky opposite the sun, usually in the early morning or late afternoon. From inside to outside, the colors of a rainbow are violet, indigo, blue, green, yellow, orange, and red.

Sunlight travels through space in the form of waves. Scientists use an idea called wavelength to describe these waves. Some light waves have long wavelengths, while others have short wavelengths. Light waves with different wavelengths appear as different colors. Usually all light waves blend together to form white light. But when light waves



A rainbow arcs over a beach in Hawaii. A faint secondary bow is visible above the bright primary bow.

pass through raindrops, they separate. This happens because the raindrops bend light waves with different wavelengths by a different amount. The separated light waves appear as the colors of a rainbow.

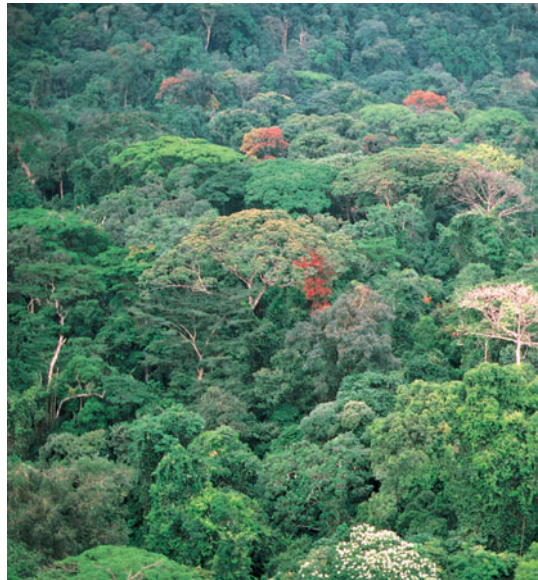
The brightest and most common type of rainbow is called a primary bow. Sometimes a fainter rainbow forms outside the primary bow. This is called a secondary bow or, sometimes, a double rainbow. A secondary bow forms when the light bends twice inside the water drops. The first bend makes the primary bow, and the second bend makes the secondary bow. The colors in the secondary bow appear in the opposite order of the colors in the primary bow.

► More to explore

Light • Rain

Rain Forest

Thick forests found in wet areas of the world are called rain forests. Most people are familiar with hot, tropical rain forests filled with trees that stay green year-round. But there are other kinds of rain forests, too. Temperate rain forests grow in cooler parts of the world, such as the northwestern United States and southern Australia. Monsoon rain forests have a dry season and trees that shed their leaves each year. They grow in Southeast Asia. The rest of this article will focus on tropical rain forests because they are important to the health of the entire planet.



Thick rain forest covers parts of the African country of Cameroon.

Where Tropical Rain Forests Are Found

Tropical rain forests grow around the equator in the hot, wet region called the tropics. They are found in parts of the tropics that get more than 70 inches (180 centimeters) of rain each year. Parts of South and Central America, western and central Africa, Southeast Asia, and Australia have tropical rain forests.

Features

Tropical rain forests can be divided into several sections. At the top of the forest is a thick layer called the canopy. It is formed by the spreading branches and thick leaves of tall trees. The canopy blocks much of the sunlight from the area below. The canopy can be between 100 and 170 feet (30 and 50 meters) above the ground. A few very tall trees stick up above the rest of the canopy. They are called emergent trees. Many

animals and insects live among the tree-tops of the canopy.

The section below the canopy is called the understory. It contains small trees, shrubs, and plants. Many of these are saplings (young trees). Their stems reach up toward the light. However, these smaller trees generally do not receive enough sunlight to grow into adult trees.

On the forest floor, bacteria, fungi, and insects help to break down dead plants and animals. This process creates a thin, rich top layer of soil that provides nutrients to the roots of the plants and trees. Because this layer of soil is thin, most of the trees have shallow root systems.

Life in Tropical Rain Forests

The trees found in tropical rain forests stay green all year, though they do shed

their leaves sometimes. Palms are among the most common trees.

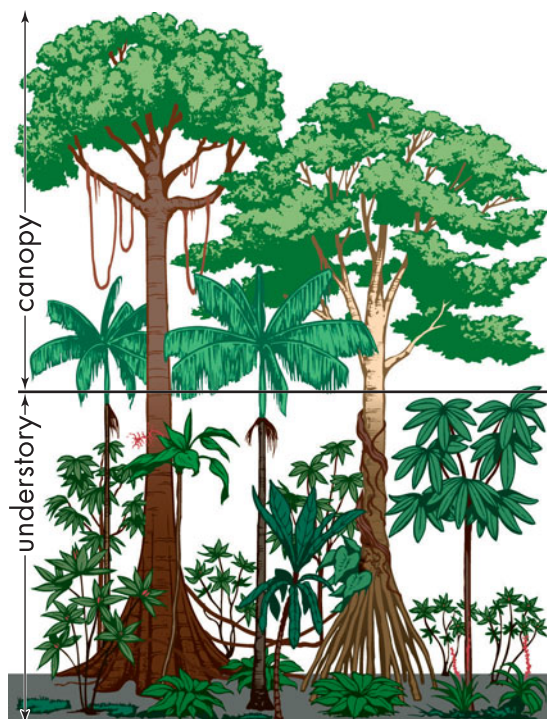
Below the thick canopy, other plants have to compete with each other to get enough light. As a result, many plants use other plants to reach toward the sunlight. For example, woody plants called lianas attach to the stems of other plants and climb from the ground to the canopy. Mosses, ferns, and orchids may also attach themselves to larger plants.

Each area of the rain forest has thousands of species, or types, of animal. Many plant-eating animals live in the canopy—for example, monkeys, flying squirrels, and sharp-clawed woodpeckers. At the lower levels of the forest are animals that run, flutter, hop, and climb in the undergrowth. On the rain forest floor are such animals as chimpanzees, gorillas, elephants, pigs, deer, and leopards.

Tropical Rain Forests in Danger

Tropical rain forests grow in many poor countries. Some poor countries sell the wood and other resources of rain forests to make much-needed money. This often means that entire sections of the forest are destroyed. The loss of rain forests endangers many plants and animals that live nowhere else in the world. Some of these plants and animals may become extinct if their rain forest habitat is destroyed.

The destruction of tropical rain forests also affects the environment of the rest of the world. Through the process



Different kinds of plants grow at different levels of a tropical rain forest.

called photosynthesis, plants produce oxygen and absorb carbon dioxide gas from the atmosphere. Because the number of plants in tropical rain forests is so huge, the forests produce much of the world's oxygen, which all animals need to live. When forests are burned, massive amounts of carbon dioxide escape into the atmosphere. This carbon dioxide leads to a problem called global warming.

► More to explore

Equator • Fern • Global Warming
• Palm

Raleigh



Population
(2000 census),
city, 276,093;
(2007 estimate)
375,806

Raleigh is the capital of the U.S. state of North Carolina. It is one of three cities—Raleigh, Durham, and Chapel Hill—that make up an area called the Research Triangle. Each of these cities has a large university that conducts scientific research. Raleigh is home to North Carolina State University and five other schools for higher education. The area also has many companies that conduct research and develop high-technology products. They are located in a group of offices called Research Triangle Park.

Most people in Raleigh work in government or in research, education, health



The North Carolina state Capitol is in Raleigh. It was built between 1833 and 1840.

care, and other service industries. Factories in the city make such products as paper, processed foods, electronics, medicines, and computers.

Raleigh was created in 1792. It was built to be the new capital of North Carolina. In 1865, during the American Civil War, the Union Army took control of Raleigh. During the 20th century the city grew greatly.

► More to explore

North Carolina

Ramadan

In the religion of Islam, the holy month of Ramadan marks when the prophet Muhammad received the words of the Koran. The Koran is the holy book of the Muslims, as the followers of Islam are called. Muslims observe Ramadan by praying, reading the Koran, and fasting.



Boys in Pakistan help to prepare meals that Muslims will eat after sunset during Ramadan.

Muslims fast by refusing to eat or drink anything during daylight hours. Small children, very old people, and people with illnesses are excused. After sunset, Muslims break their fast with prayer and festive nighttime meals. The end of the monthlong fast is celebrated as a festival.

Ramadan is the ninth month of the Islamic calendar. Since the Islamic calendar is based on the moon, Ramadan may occur in any season of the year. The 27th night of Ramadan is celebrated as the Night of Power, or Lailat al Kadr. On that night, it is said, God revealed the Koran. Ramadan officially ends when religious officials first see the new moon.

► More to explore

Islam

Rap

The musical form called rap is basically rhythmic, rhyming speech. Rap is the

most important part of a way of life called hip-hop culture. Many people call the music that rappers use hip-hop music.

Rap songs often tell stories about rappers and their backgrounds. Some rappers speak about racism and its effects on African Americans. Most rappers have been men. Some women, such as Queen Latifah, have become successful rap artists as well.

Rap began in the early 1970s in African American neighborhoods in New York City. The first rapper was probably a Jamaican deejay named Kool Herc. (Deejays play recordings at dance clubs.) Kool Herc used two turntables, or record players, to create sound for parties in the Bronx section of New York. As the music played he would “rap,” or talk, to the audience.

In time other deejays developed the rhyming musical speech that became rap. Early rappers included Afrika Bambaataa and Grandmaster Flash. In 1979 the Sugarhill Gang’s song “Rapper’s Delight” became the first hit rap song.



Rap artists perform for a crowd at an awards show.

During the 1980s rap mixed with other forms of popular music, including rock and soul. Some popular rappers during this time were LL Cool J, Run-D.M.C., the Beastie Boys, and De La Soul. Public Enemy performed rap songs with strong political messages.

In the 1990s a form of rap known as gangsta rap became popular. Gangsta rap songs by N.W.A., Ice-T, and other performers described the drug use, gangs, and violence found in inner cities. Other rappers continued to mix rap with other forms of music—for example, the Fugees used reggae, and OutKast used funk.

► More to explore

Hip-Hop • Popular Music

Raptors

► see Bird of Prey.

Raspberry

Raspberries are delicate, juicy fruits. They are eaten fresh. They are also canned, processed for jams, put into pastries, or frozen. Raspberries are a source of vitamin C, vitamin A, and iron.

Raspberries grow in the United States and Europe. They thrive in places where summer is not very hot and winter is not very cold.

Raspberries are usually red, purple, or black. They grow on prickly bushes



Each raspberry is actually a cluster of tiny fruits.

called brambles. The bushes produce small flowers that develop into the berries.

Botanists (people who study plants) do not consider raspberries to be true berries. True berries, such as cranberries and blueberries, are single fruits that develop from a single flower. But a raspberry is actually a cluster of small fruits that develop from a single flower. The small fruits are attached to a firm core. When a raspberry is picked, the core stays on the plant. This is why a picked raspberry is hollow inside.

Raspberries are similar to blackberries. But when a blackberry is picked, the core stays inside the fruit. Another difference is that raspberries are hairy but blackberries are smooth.

► More to explore

Blueberry • Cranberry • Fruit

Rat



A mother rat protects her babies in the corner of a barn.

Rats belong to the group of mammals called rodents. They live throughout the world, either in the wild or around people. They usually stay out of sight by squeezing into tight hiding spaces.

Rats look like mice but are usually larger. A rat is usually about 7 to 10 inches (18 to 25 centimeters) long, not including the tail. The fur can be gray, white, black, or brown. Rats have sharp teeth. They use their teeth to defend themselves against birds, snakes, and other enemies.

Rats are most active at night. Rats in the wild eat leaves, branches, seeds, and roots. Some eat small animals. Rats living near people will eat almost anything that people eat. They also gnaw on all kinds of objects other than food, such as walls and telephone cables.

Rats can reproduce quickly. Females that are only a few months old can have

babies. A rat can have as many as 150 babies every year.

Many people think rats are pests. With their big appetite, rats can destroy crops and stored grain. Rats also can spread diseases, such as the plague. But rats can be useful, too. Medical researchers use them in experiments. Some people keep rats as pets.

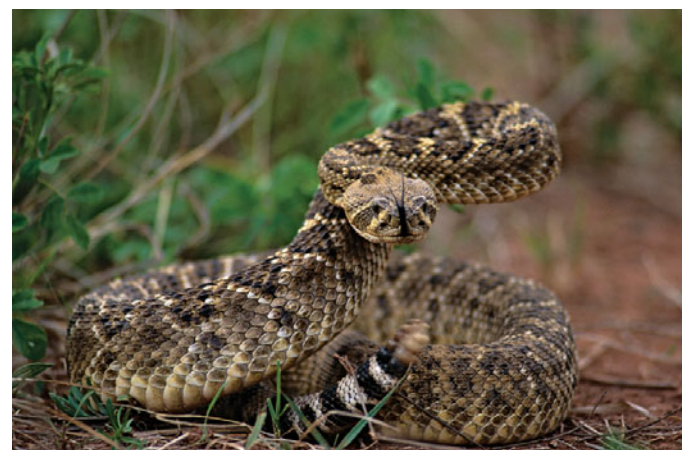
► More to explore

Mammal • Plague • Rodent

Rattlesnake

Rattlesnakes are poisonous snakes that have rattles in their tails. A rattlesnake shakes its rattle to threaten, or warn off, other animals.

There are about 30 species, or types, of rattlesnake. They live in the Americas, from southern Canada to Argentina. They are most common in the deserts of the southwestern United States and northern Mexico.



A western diamondback rattlesnake shakes its rattle.

Most rattlesnakes are gray, tan, or brown with diamond-shaped patches or crossing diagonal bands. They are usually between 1 foot (0.3 meter) and 8 feet (2.5 meters) long. The head is shaped like a triangle.

Rattlesnakes belong to a group of snakes called pit vipers. Between each eye and nostril, a rattlesnake has a heat-sensing organ called a pit. It uses these pits to find prey. Rattlesnakes eat rodents, lizards, and birds. When a rattlesnake bites, venom, or poison, flows through its fangs into the prey.

When threatened, a rattlesnake raises and shakes its tail rattle. The rattle is made up of several hollow, loosely connected segments. It makes a buzzing sound when the segments rapidly hit each other. The sound warns intruders to back off.

Most rattlesnakes are shy and try to stay away from people. But if disturbed, a rattlesnake will bite a person. Rattlesnake bites are painful and can be life-threatening. But prompt medical treatment can usually stop the effects of the venom.

► More to explore

Snake • Viper

Raven

Ravens are large, black birds that are closely related to crows. They belong to a scientific group of birds called songbirds. However, their voices do not sound very musical. They make a variety



Ravens are larger and heavier than crows.

of noises, such as caws, croaks, and gurgles. People in some cultures think of these dark birds as symbols of death and bad things to come. However, some people admire ravens for the birds' great intelligence.

Ravens and crows are in the same family as jays and magpies. There are several different species, or types, of raven. The common raven is found in parts of North America, Europe, Asia, and Africa. Other types of raven also live in those four continents as well as in Australia.

Ravens are very hardy birds. They are found in a variety of habitats, including forests, mountains, deserts, and frozen plains.

Ravens look a good deal like crows. However, ravens are heavier and have bigger bills. They can measure up to 26 inches (66 centimeters) in length. Ravens also have shaggier feathers than crows do, especially around the throat. Ravens' feathers are all or mostly black, often with a blue or purplish shimmer. Several types

have some white or brown markings. The common raven is all black.

Ravens eat a varied diet that includes mice, insects, grain, and the eggs of other birds. They also feed on dead animals and garbage.

► More to explore

Bird • Crow • Magpie • Songbird

Ray

A ray is a fish with a flattened body and large, winglike fins. Rays belong to the same large group of fishes as sharks. Both rays and sharks have skeletons made up of cartilage (elastic tissue) instead of bone. Rays are found in all oceans of the world.

There are more than 300 different species, or types, of ray. These can be divided into several groups: skates, electric rays, sawfishes, and stingrays.

Rays vary in size. The little, or hedgehog, skate is less than 20 inches (50 cen-

timeters) long. The Atlantic manta, or giant devil ray, has a wingspan of up to 23 feet (7 meters).

Most rays have rough skin. It may be a solid color or patterned. Electric rays, however, have smooth skin. They also have electric organs near the head. These give powerful electric shocks to enemies or prey. A ray's tail is slender and sometimes long and whiplike. Stingrays have a poisonous spine on the tail. They use it for defense. Sawfishes have a long snout shaped like a saw. They use it mainly for hunting.

Rays often lie partly buried in sand or mud on the ocean floor. They feed on small fish and such crustaceans as crabs and shrimp. When prey gets close, rays quickly lunge out of the sand and snatch it up.

The females of most species give birth to live young. However, skates lay eggs.

► More to explore

Fish • Shark



Two southern stingrays swim in shallow water.

Re

In ancient Egyptian mythology Re was the chief sun god. (His name is sometimes spelled Ra.) The sun god was very important to the Egyptians. The ancient pharaohs (kings) said they were related to him.

According to legend, Re created the universe. Time began when his sun disk rose out of the darkness for the first time. At creation, Re made Shu (air)



Re was the sun god of ancient Egypt.

and Tefnut (moisture). They gave birth to the sky goddess Nut and the Earth god Geb. From the marriage of Nut and Geb came the gods Osiris, Isis,

Seth, and Nephthys. These gods were the main figures of Egyptian mythology.

The Egyptians believed that at sunrise Re—the sun—began a journey across the sky in his boat. At sunset Re sailed his boat to the underworld. There each night he fought an evil snake named Apopis. Apopis tried to prevent the sun from rising again. But each night Re won. Each morning he began another journey across the sky, and the sun rose again.

► More to explore

Egypt, Ancient • Isis and Osiris
• Mythology

Reagan, Ronald

Ronald Reagan was elected in 1980 as the 40th president of the United States. Reagan was a conservative who cut some kinds of government spending but strengthened the military. He strongly opposed the Soviet Union and other Communist countries.

Early Life and Career

Ronald Wilson Reagan was born in Tampico, Illinois, on February 6, 1911. His parents were Jack Reagan, a shoe salesman, and Nelle Wilson. At high school in Dixon, Illinois, Reagan played football and acted in school plays.

After graduating in 1932 from Eureka College, Reagan became a radio sports announcer in Iowa. In 1937 he moved to southern California, where he became a successful movie actor. His first film,

Did You Know?

Reagan's good speaking skills earned him the title The Great Communicator.



Ronald Reagan was the 40th president of the United States.

Love Is on the Air, was released in 1937. Reagan went on to appear in more than 50 movies and several popular television shows.

During World War II Reagan joined the Army Air Corps but did not see combat. In 1940 he married the actress Jane Wyman. They had a daughter and

adopted a son before getting a divorce in 1948. Reagan married the actress Nancy Davis in 1952. They had a daughter and a son.

Political Career

Reagan was a Democrat during the 1940s. After growing more conservative, he switched to the Republican Party in 1962.

Reagan was elected governor of California in 1966 and in 1970. In 1980 he ran for president with George Bush as his running mate. Reagan defeated President Jimmy Carter that year. He took office in January 1981. Reagan ran for reelection in 1984. He easily defeated his opponent, Walter F. Mondale.

Presidency

Reagan worked to reduce the role of the federal government. Congress approved many of his proposals to cut spending, except for defense, and to lower taxes.



TIMELINE

Reagan is born in Tampico, Illinois.

February 6, 1911

Reagan is elected president.

1980

The Iran-contra affair becomes public.

1986

Reagan dies in Los Angeles, California.

June 5, 2004

Reagan is elected governor of California.

Reagan survives an assassination attempt.

Reagan retires; George Bush becomes president.

1966

1981

1989

On March 30, 1981, a man shot Reagan in the chest in Washington, D.C. Reagan recovered after surgery.

In foreign affairs, Reagan built up the military to protect the country from the Soviet Union. He also proposed a system that would destroy missiles in space. He called the system the Strategic Defense Initiative. Reagan later improved relations with the Soviets. His historic meetings with Soviet leader Mikhail Gorbachev led both countries to destroy some nuclear weapons.

In 1986 the public discovered that officials who worked for Reagan had illegally sold weapons to Iran. The officials hoped that Iran would help to free U.S. hostages in Lebanon. They had then secretly sent money from the weapons sales to anti-Communist rebels (*contras*) in Nicaragua. The Iran-*contra* affair embarrassed Reagan, but he soon regained his popularity.

Later Years

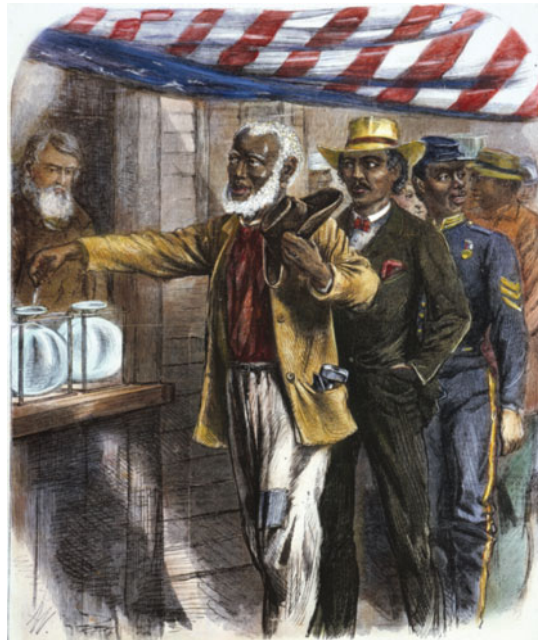
Reagan retired in 1989. In 1994 he announced that he had Alzheimer's disease. Reagan died on June 5, 2004, in Los Angeles, California.

► More to explore

- Alzheimer's Disease • Bush, George
- Union of Soviet Socialist Republics
- United States

Reconstruction

After the American Civil War ended in April 1865 the United States went through a period known as Reconstruc-



An illustration shows African American men lining up to vote for the first time. Men who had been slaves gained the right to vote during Reconstruction.

tion. The Union (the Northern states) had defeated the Confederacy (the Southern states that had left the Union). From 1865 to 1877 the two sides worked to put the United States back together.

During Reconstruction, people disagreed on how to readmit the Southern states, or bring them back to the Union. They also disagreed on what to do about African Americans who had won freedom from slavery.

Radical Reconstruction

While the war was still going on, President Abraham Lincoln made a plan to readmit Confederate states quickly. Lincoln was killed in April 1865. Andrew Johnson then became president. He wanted to carry out Lincoln's plan.

Some members of the U.S. Congress, called Radical Republicans, disagreed with Lincoln and Johnson. They wanted to punish the South. They also wanted to protect African Americans. In 1867 the Radical Republicans took control of Congress. The period that followed is called Radical Reconstruction.

During Radical Reconstruction, lawmakers put the South under military rule and removed most white Southern leaders from power. This left control of the Southern states in the hands of African Americans and whites loyal to the Union. Some of these whites were criticized by Southerners, who called them carpetbaggers. The term referred to the idea that they were Northerners who came to the South carrying only what

they could put in a small bag. Southerners also accused them of coming to take advantage of the situation. Some white Southerners cooperated with the blacks and carpetbaggers. Other Southerners accused those who cooperated of doing so in order to further their own interests. They called them scalawags.

Congress also required Southern states to ratify (approve) the 14th Amendment to the Constitution before they could rejoin the Union. This amendment guaranteed citizenship to African Americans. By 1870, all 11 former Confederate states had approved the amendment and rejoined the Union.

Freed African Americans

Meanwhile, nearly 4 million former slaves tried to start new lives in the South. A government agency called the Freedmen's Bureau helped them. It provided medical care and food. It also built more than 1,000 schools.

In 1870 the 15th Amendment to the Constitution guaranteed African Americans the right to vote. These new voters helped to elect African Americans to many offices, including seats in Congress.

Despite these gains, most African Americans in the South were still poor. They had no way to buy land and ended up working on farms for low pay.

Reconstruction Ends

Reconstruction gradually came to an end for several reasons. Some radical leaders died. People accused some



A cartoon from the 1870s makes fun of a Northern politician. It shows him as a carpetbagger, or a Northerner who moved to the South with only what he could carry in a small bag. (At the time, traveling bags were commonly made of carpet.)

Reconstruction governments of dishonesty. New terrorist groups like the Ku Klux Klan stopped African Americans from voting or running for office. As a result, Southern Democrats (who had supported the Confederacy) took back control of governments in the South.

The final blow came with the presidential election of 1876. The vote was so close that both Republicans and Democrats claimed victory. The Democrats allowed the Republican winner, Rutherford B. Hayes, to become president only after making a deal. Hayes promised to remove U.S. Army troops from the South. The troops left in 1877. Southern Democrats were then in complete control of the South. Reconstruction was over.

► More to explore

African Americans • American Civil War
• Hayes, Rutherford B. • Johnson, Andrew • Ku Klux Klan

Recycling

Recycling is a way to reduce the amount of garbage that is thrown away. Every year the United States produces millions of tons of garbage. The garbage is sent to landfills, where some of it pollutes the land and air. As a result of recycling, some things that would have been thrown away are reused instead in new products.

What Gets Recycled

Many items can be recycled, including aluminum cans, glass bottles, newspa-



Recycling starts when recyclable materials are sorted and left to be picked up.

pers, magazines, and plastics. Composting is also a form of recycling. It involves saving certain food wastes and mixing them with grass clippings and leaves. This creates a nutrient-rich mixture that can be used in gardens. Even water can be recycled. Before water is reused, it is cleaned and purified at a wastewater treatment plant.

Types of Recycling

There are two types of recycling: internal and external. In internal recycling, the waste products from manufacturing processes are reused within the same factory. For example, when copper tubing is being made, the ends of the tubes are usually trimmed. These copper ends are melted down and used to make new tubing.

In external recycling, people collect recyclable materials. The recyclables are brought to a recycling facility, where they are sorted, cleaned, and prepared to be sold. Industries then buy the material and use it to make new products.

Importance of Recycling

Governments and groups that try to protect the environment have encouraged people to recycle. They say that recycling is important in several ways. It reduces pollution of air, water, and land. It also protects natural resources such as trees, minerals, and oil. These do not get used up as quickly if people can reuse existing products made from these resources.

► More to explore

Environment • Natural Resource
• Pollution

Red Cross and Red Crescent

The International Movement of the Red Cross and Red Crescent is a collection of groups that help people during times of war and natural disasters. The groups are not religious. However, the Red Cross is the name used in mainly Christian countries. The Red Crescent is the name used in mainly Muslim countries. (A cross is a symbol of Christianity and a crescent is a symbol of Islam.)

More than 180 Red Cross and Red Crescent societies, or groups, exist throughout the world. For example, there are an American Red Cross, a British Red Cross, and a Pakistan Red Crescent. Each society is independent and offers its own services. The societies provide medical help, food and water, and shelter to victims of earthquakes, floods, and other natural disasters. They also



Red Cross workers in South Korea prepare aid kits to be sent to North Korea. North Koreans needed help after a train accident injured many people.

help people during times of war. During peacetime, the societies teach first aid and safety skills. Many also run blood banks.

The International Committee of the Red Cross (ICRC) was the first Red Cross group. It is based in Switzerland. The ICRC helps people affected by wars or other violent conflicts. Because it never takes sides in wars, most countries trust this group. Countries often allow the ICRC to work in areas where other groups are not allowed.

A Swiss man named Jean-Henri Dunant started the Red Cross movement. In 1863 he helped to form an international group of people to help wounded soldiers. These helpers began using a red cross as their symbol. The group became known as the ICRC in 1875. In 1901

Did You Know?

A woman named Clara Barton founded the American Red Cross in 1881.

Dunant shared the first Nobel peace prize for his work.

► More to explore

Nobel Prize • Switzerland

Red Sea

The Red Sea separates the Arabian Peninsula from northeastern Africa. It was named for the changing color of its water. Normally the water is blue-green. Sometimes, though, red algae turn the water reddish brown.

The Red Sea is long and narrow. On the east it is bordered by the Arabian countries of Saudi Arabia and Yemen. The African countries of Egypt, Sudan, and Eritrea lie to the west. In the south a passageway called a strait connects the Red Sea with the Gulf of Aden and then with the Arabian Sea. In the north the Suez Canal connects the Red Sea to the Mediterranean Sea.

The Red Sea is one of the world's busiest trade routes. Ships carry passengers and goods between Europe and Asia through the Suez Canal. The



There are a number of coral reefs in the Red Sea.

sea also contains deposits of oil and other minerals.

The Red Sea is one of the first large bodies of water mentioned in recorded history. Egyptians used the sea for trade as early as 2000 BC. The Suez Canal was opened in 1869. It made trade and transportation on the sea much easier.

► More to explore

Arabian Peninsula • Suez Canal



Redwood

The redwood is the world's tallest type of tree. One tree was measured at 367.8 feet (112.1 meters) tall. Many redwoods grow to heights of more than 300 feet (90 meters).

The redwood grows in Oregon and California. It is found in foggy areas near the Pacific coast. A related tree is the dawn redwood. It grows in central China. Two other trees are sometimes called redwoods: the giant sequoia of

California and the Japanese cedar of eastern Asia.

The redwood has a huge trunk. It can be 10 to 20 feet (3 to 6 meters) across. The trunk may have no branches for the first 100 feet (30 meters). This is because the redwood sheds its lower limbs as it grows. The leaves on the lower branches are dark green and pointed. Short needles grow near the tree's top. The redwood has small cones. They are only about 1 inch (2.5 centimeters) long.

A redwood may live for more than 1,500 years. Its long life is partly due to the tree's thick bark. Redwood bark can be more than 12 inches (30 centimeters) thick. It helps the tree to resist disease and parasites, or harmful animals. The bark also resists fire.

Redwood timber is used to make furniture, shingles, and fence posts. Several state parks have been created to protect



The redwood tree that grows in California and Oregon is sometimes called the coast redwood. Its scientific name is *Sequoia sempervirens*.

the trees. In 1968 Redwood National Park was established in California.

► More to explore

Giant Sequoia

Reformation

A religious movement known as the Reformation swept through Europe in the 1500s. Its leaders disagreed with the Roman Catholic church on certain religious issues and criticized the church's great power and wealth. They broke away from the Catholic church and founded various Protestant churches. Today, Protestantism is one of the three major branches of Christianity. As the Reformation spread across Europe, it also inspired movements for political and social change.

Origins and Spread

In the early 1500s almost everyone in western and central Europe was Roman Catholic, and the church was very powerful. The Reformation began in 1517. In that year a German priest named Martin Luther circulated a list of doubts he had about certain Catholic beliefs and practices. Soon after, Luther came to reject the authority of the church and its leader, the pope. He thought that people could learn all religious truths directly from the Bible. Luther also believed that people are saved by their faith alone, not by works they do. He called for the end of most of the sacraments, or rituals, of Catholicism.



An illustration shows Martin Luther (right) meeting with Roman Catholic leaders. Luther was a major figure in the Reformation.

The pope condemned Luther's teachings. But Luther's message spread quickly. Huldrych Zwingli called for even greater changes in Christian worship. He converted many people in Switzerland to Protestantism. John Calvin helped bring the Reformation to France and made Geneva (now in Switzerland) into a Protestant city-state. In 1534 King Henry VIII established the Church of England, with himself as leader. Influenced by Calvin, John Knox helped found the Presbyterian church in Scotland. By the mid-1600s Europe was mostly divided into Protestant and Catholic regions. Most of these divisions have remained in place. In the 1600s the settlers of the British colonies brought Protestantism to North America.

Counter-Reformation

The Roman Catholic church tried to stop the spread of Protestantism with its own movement, the Counter-

Reformation. Members of a religious order known as the Jesuits spread Catholicism through their teaching and missionary work. A Catholic court system called the Inquisition punished Catholics who disobeyed church teachings. From 1545 to 1563 a Catholic body known as the Council of Trent made many changes to the Catholic church in an attempt to correct its problems. The Counter-Reformation won back many people who had left the Catholic church.

► More to explore

Calvin, John • Henry VIII • Luther, Martin • Protestantism • Roman Catholicism

Refugee

When people leave their country to seek refuge, or protection, in another country, they are called refugees. Sometimes governments force people to leave their country. Other people leave their coun-



A refugee camp in Kyrgyzstan houses people who escaped violence in their home country of Uzbekistan. Many refugees must live in temporary homes, such as tents.

try because they belong to a group that is being mistreated. Still others leave their country to escape wartime conditions or starvation.

Even though they seek shelter in a new country, refugees often continue to think of the old country as their home. They may want to move back if conditions change. This makes refugees different from other migrants, who want to change their homes permanently. Refugees are also different from displaced persons. These are people who are forced from their homes but not out of their country.

Refugees Before the 1900s

Before the 1900s, many refugees were people who disagreed with their country's religion. In the 1400s a Roman Catholic court called the Inquisition forced the Jews out of Spain. Beginning in 1685, French Catholics expelled French Protestants called Huguenots from France.

These refugees often moved to new countries with few problems. There were not many rules about movement from one country to another. This situation changed when modern nations developed in the 1800s. Refugees from modern nations needed to ask permission to enter another country. The new country then decided whether to offer asylum, or protection, to the refugees. (Asylum prevents refugees from being handed back to the country that mistreated them.)

Refugees in the Early 1900s

The battles of World War I (1914–18) forced many refugees from Belgium, France, Italy, and Romania. These refugees resettled in their homelands after the war. However, the Russian Revolution of 1917 forced more than 1.5 million out of Russia permanently. Meanwhile, Turkey forced more than 1 million Armenians to move to Syria and Palestine between 1915 and 1923.

The new international organization called the League of Nations decided to deal with the growing problem of refugees. It appointed a Norwegian explorer named Fridtjof Nansen to help refugees. Nansen created a League of Nations Passport to allow refugees to move freely across national boundaries. He won the Nobel peace prize (an important international award) in 1922 for his work.

World War II and Its Aftermath

World War II (1939–45) created more than 60 million refugees. Jews fleeing the Nazi leaders of Germany made up a large portion of them. Many entered the United States, and others moved to South America and other places. Hundreds of thousands of people left Poland for the Soviet Union. In Asia, Japanese attacks forced more than 30 million Chinese people from their homes.

In Europe, many events that followed the war created still more refugees. Millions of Germans had to move out of a region called East Prussia when it became a part of Poland. In addition,

Did You Know?

One goal of the organization called Amnesty International is to help refugees find asylum.



World War II refugees cross a wrecked bridge in Germany in 1945.

the Soviet Union began setting up Communist governments in eastern European countries. People left those countries because they were afraid of losing their freedom.

The United Nations (UN) replaced the League of Nations in 1945. In 1950 the UN created an office to help refugees. The office, called the Office of the High Commissioner for Refugees, won the Nobel peace prize in 1954 and 1981.

Refugees Since World War II

The two world wars were not the only events that created many refugees. In 1947 the British divided their colony of India into two new independent countries: India, where the main religion was Hinduism; and Pakistan, where the religion was Islam. Eighteen million people crossed the borders in order to live with others of their own religion.

During the 1900s, many Jewish migrants and refugees settled in the

Middle East in the region called Palestine. They created Israel as a Jewish homeland in 1948. After that, many Arabs who had been living in Palestine became refugees themselves.

Millions of refugees fled Asian wars. One such war was the Korean War of 1950–53. Another was the Vietnam War that ended in 1975. Another was the invasion of Afghanistan by the Soviet Union in the 1980s. More than 1 million refugees left Iraq during the Persian Gulf War in 1991.

Events in Africa, the Americas, and Europe also created refugees. Civil wars in Africa forced millions from their homelands. When the Caribbean nation of Cuba became Communist in 1959, more than 1 million refugees left the island. The breakup of Yugoslavia in the 1990s set off fighting between its different groups of peoples. Two million people had to leave their homelands.

In the early 21st century, the UN estimated that there were still about 10 mil-



A family of refugees from Afghanistan seeks help from the UN High Commissioner for Refugees.

lion refugees in the world. Many of them lived in crowded camps because they were unable to find permanent homes in the countries that they fled to.

► More to explore

Migration, Human • United Nations

Reindeer

Reindeer are mammals of the deer family along with moose and elk. They are also called caribou. All reindeer grow pairs of antlers, which are large bony growths on the head. Female reindeer are the only females of the deer family to grow antlers.

Reindeer live in the far northern regions of North America, Europe, and Asia. They live in forests and the Arctic tundra, or treeless plains of the far north.

Compared to other members of the deer family, reindeer have thicker bodies and shorter legs. Reindeer stand about 2 to 5 feet (0.6 to 1.5 meters) high at the shoulder. They can weigh as much

as 700 pounds (320 kilograms). They have thick coats of brown, gray, or whitish fur. Their feet have wide hooves.

Reindeer live together in herds. The herds travel long distances between their summer and winter homes. Reindeer eat grasses, other plants, and a plantlike material called reindeer moss.

Reindeer breed in autumn. The males often battle each other for mates. The females usually give birth to one baby at a time.

Some people, including the Sami of northern Europe, keep herds of reindeer. They use the animals to pull sleds over the snow. They also raise reindeer for their meat, milk, and skins.

► More to explore

Deer • Tundra

Religion

People often use the word religion to mean the worship of a god or gods. But some religions do not have gods. One thing that all religions have in common is that they help their followers to find meaning in the world. Many people want to know where the world came from. Many also want to know what happens after death. Most religions offer some sort of answer to these great questions. The major world religions of today are Christianity, Islam, Hinduism, Buddhism, Sikhism, and Judaism.



Some reindeer are found in the Arctic tundra, while others are forest animals.

Major World Religions	
Religion	Number of Followers in the World, Mid-2005
Christianity	2,133,806,000
Islam	1,308,941,000
Hinduism	860,133,000
Buddhism	378,808,000
Sikhism	25,377,700
Judaism	15,073,000
Source: Britannica Book of the Year, 2006	

Nearly three quarters of the people on Earth follow one of six major world religions.

Types of Religion

Throughout history there have been two main types of religion. One type has a single, all-powerful god. Judaism, Christianity, and Islam are the major religions that say there is one god. Other religions with one god include Sikhism and Baha’i.

In the other main type of religion, followers believe in more than one god. The religions of this type include Hinduism, Jainism, Shinto, Zoroastrianism, Native American religions, and traditional African religions.

Followers of other religions do not focus on worshipping gods. For example, followers of Buddhism search for a higher state of being, which means freedom from suffering. Followers of Daoism focus on acting in a certain way.

Common Elements of Religion

Religions usually have rituals, or special patterns of actions, that followers perform. They often have prayers that followers say and holidays on certain days of the year. Many religions have written

works that are considered holy, such as the Bible or the Koran. Many religions also have special buildings, such as churches or temples, where followers gather for worship.

Religions set out rules or guidelines for how followers should live. Different religions have different rules. However, many religious rules have to do with treating others well and doing the right thing. Religions also have sets of beliefs that followers accept as true—for example, belief in a god and life after death.

Religions have played a very important role in the history of people all over the world. They have affected almost every part of people’s lives. For example, religions have affected the way governments are set up, how families are formed, and the way people teach their children.

More to explore

- Baha’i Faith • Buddhism • Christianity • Daoism • Hinduism • Islam • Jainism • Judaism • Shinto • Sikhism • Zoroastrianism

Rembrandt

The Dutch painter Rembrandt is one of the most famous of all European artists. He created many historical and biblical paintings known for their rich color and masterful use of light and shadow. He is also known for his drawings and etchings (a type of print).

Rembrandt was born on July 15, 1606, in Leiden, the Netherlands. His full

Did You Know?

Religions that focus on the belief in one god are called monotheistic.



Rembrandt painted his own portrait at age 63.

name was Rembrandt Harmenszoon van Rijn, but he is usually known simply by his first name. He attended the University of Leiden but left to study painting. By the time he moved to Amsterdam in 1631, he was already a successful painter. Many wealthy people hired him to paint their portraits. An early masterpiece of his was *The Anatomy Lesson of Dr. Nicolaes Tulp*, a group portrait painted in 1632. He completed another famous group portrait, *The Night Watch*, in 1642.

Around that time Rembrandt's work began to go somewhat out of fashion. With fewer orders for portraits, he began to have money problems. In the late 1650s he sold his house and many of his belongings to pay his debts. But he continued his work, producing portraits of biblical figures, local people,

and himself. Rembrandt died on October 4, 1669, in Amsterdam.

► More to explore

Painting

Renaissance

The Renaissance was a period in European history. It began in the 1300s, during the late Middle Ages. It ended during the 1500s, when the modern era began. Renaissance means “rebirth” in French. During the Renaissance there was a rebirth of interest in ancient Greece and Rome. The Europeans of the Renaissance took ideas from the ancient people and developed their own. They also made scientific discoveries and created great art.

Background

During the Middle Ages there were two institutions that controlled much of Europe. The Holy Roman Empire influenced the political life of the people. The popes of the Roman Catholic church controlled the religious life. Both of these institutions began to lose power by the 1300s. Individual European nations also grew stronger. People started writing in their own languages instead of Latin (the language of the Catholic church). People felt freer to think in new ways.

Humanism

Before the Renaissance, most people in Europe placed great importance on God and religion. During the Renaissance, some people began to think about the

importance of humans as well. For this reason these thinkers were called humanists. Humanists wanted to make the most of their lives on Earth. They also wanted to understand the world around them.

One of the first humanists was Francesco Petrarch, an Italian poet who died in 1374. Petrarch was interested in what ancient writers had to say about humanity. He got many other people, including the great storyteller Giovanni Boccaccio, to share his interests.

The Printing Press

In about 1450 a German named Johannes Gutenberg invented the printing press. This allowed people to make many copies of written works. Printed books soon spread the ideas of the Renaissance all over Europe.



A map of the Western Hemisphere from the 1500s shows that people during the Renaissance were still discovering how the world looked.



An illustration shows Andreas Vesalius, a doctor during the Renaissance. Vesalius cut open dead bodies to learn how the human body works.

One of the first thinkers to have his writings printed was Desiderius Erasmus of Rotterdam (now in The Netherlands). Erasmus was a humanist scholar.

Science

The spirit of inquiry and discovery also led to a Renaissance in science. In the Middle Ages, scholars usually took their scientific knowledge from books. During the Renaissance, however, people began to experiment and observe for themselves.

Nicolaus Copernicus, who was born in Poland, was one of the greatest astronomers of the Renaissance. He showed that Earth revolves around the sun. For more than 1,000 years before that people had

believed that everything in the universe revolved around Earth.

Andreas Vesalius was a medical doctor from Brussels (now in Belgium). Vesalius found out about the human body by carefully dissecting, or cutting apart, dead bodies.

Art



A painting from the early 1500s shows the realistic style of art that was popular during the Renaissance. It also shows the type of dress worn by wealthy ladies in Italy.

Some of the greatest Renaissance artists worked in Florence and in other cities in Italy. The rulers of Florence, the Medici family, spent great amounts of money to have artists create pictures, buildings, and statues.

Leonardo da Vinci worked during the late 1400s and early 1500s. He painted two of the world's most famous works: the *Mona Lisa* and the *Last Supper*.

Leonardo also made statues and designed weapons. He even drew up plans for a helicopter.

Michelangelo and Raphael were also important artists of this period. They painted religious figures but gave them a realistic, human quality.

Exploration

The Renaissance also led people in Europe to explore parts of the world they had never seen. Christopher Columbus and others from Spain and Portugal discovered two continents—North and South America—that had been unknown to Europeans. This led to other voyages of discovery.

Late Renaissance

No one event marks the end of the Renaissance. The spirit of discovery that defined the period led people to try new ideas in all areas of life. Slowly artists turned to new styles. New ways of thinking about other fields, such as government and politics, also developed.

► More to explore

Copernicus, Nicolaus • Gutenberg, Johannes • Leonardo da Vinci • Medici Family • Michelangelo • Middle Ages

Reproductive System

All living things reproduce, or create offspring. Animals' offspring are often called babies. The body parts that allow animals to create babies belong to the reproductive system.

Types of Reproduction

Some animals can create offspring through asexual reproduction. This means that one animal creates offspring on its own. For example, corals, hydras, and sea anemones can reproduce through a process called budding. In budding, a growth called a bud breaks off from the animal to make a new animal. A few animals, including some worms, can break in half to create two separate animals.

Most animals use sexual reproduction to have babies. This means that two sex cells, one from a male and one from a female, join together to create a baby. In some animals, including many types of fish, the male and female sex cells join together in water, outside the female's body. In other animals the sex cells join together inside the female's body.

After the sex cells join they grow into a baby. The babies of some animals, such as birds and many reptiles, develop in eggs outside the female's body. The babies of most mammals develop inside the female's body.

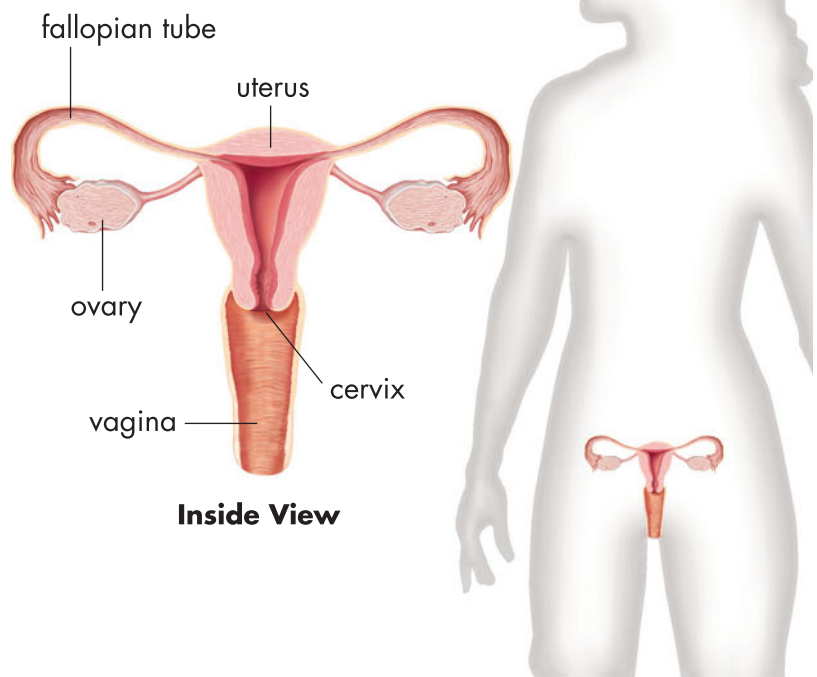
Human Reproduction

Like other mammals, humans reproduce sexually. A woman's body supports a baby as it grows. For these reasons men and women have different reproductive organs.

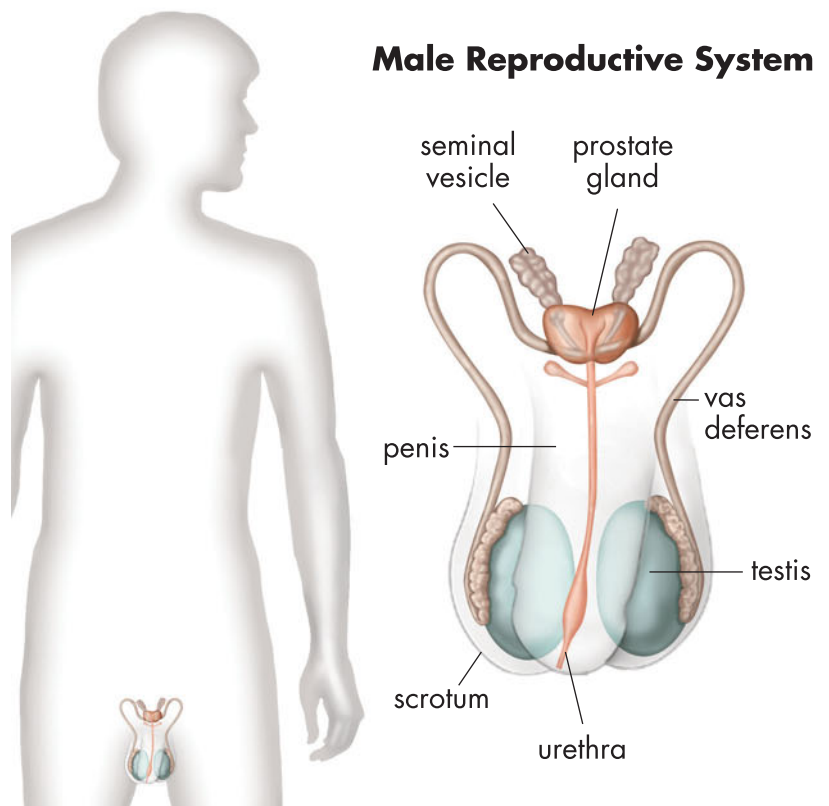
Male Reproductive System

In men the main reproductive organs are the testes. The two oval-shaped

Female Reproductive System

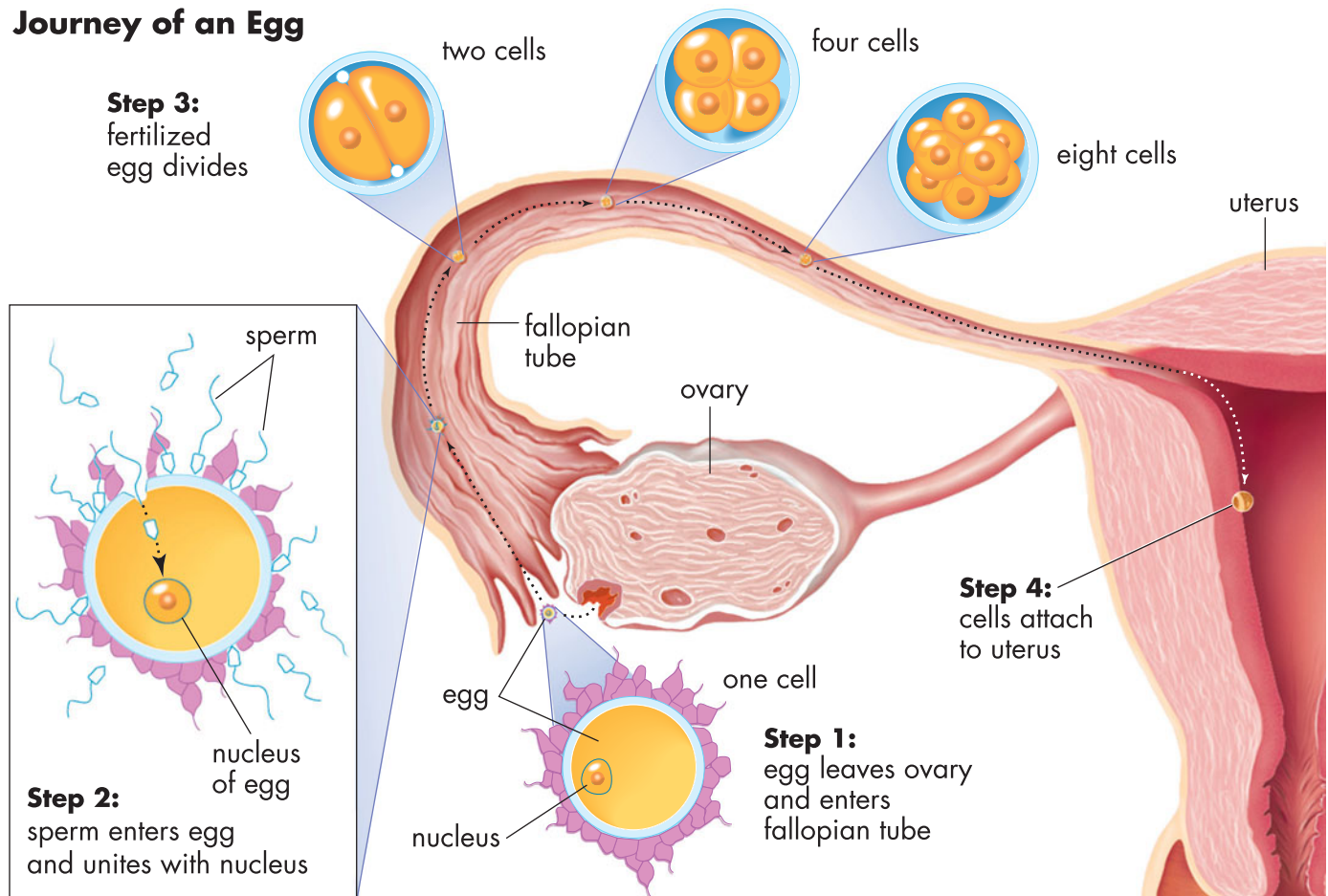


Male Reproductive System



Men and women have different reproductive organs. A woman's ovaries produce egg cells. A man's testes produce sperm.

Journey of an Egg



One of a woman's ovaries releases an egg each month. If the egg meets a sperm cell, it may become fertilized. The fertilized egg travels to the uterus, where it grows into a baby.

testes sit behind the penis in a pouch called the scrotum. The testes make the male sex cells, called sperm. Sperm are too tiny to see without a microscope. They are shaped like tadpoles with long tails. The tail of a sperm is what moves it forward.

The sperm travel through a tube toward the penis. They mix with other fluids to form a liquid called semen. During sexual intercourse a small amount of semen passes through the tip of the penis into the woman's body. This semen contains between 200 and 300 million sperm. The sperm then travel toward the woman's sex cell, or egg.

Female Reproductive System

In women the main reproductive organs are the ovaries. The two almond-shaped ovaries sit inside the lower belly. When a girl is born her ovaries contain up to 500,000 egg cells. Two tubes, called fallopian tubes, connect the ovaries to the uterus. The uterus is a muscular organ that holds a growing baby.

Beginning when a girl is about 12 years old, one ovary releases an egg once a month. This process is called ovulation. The egg travels from the ovary through the fallopian tube to the uterus. If the egg does not meet a sperm cell on its journey, it dies. The egg and some blood

then pass out of the uterus and through the vagina, a muscular tube that leads out of the body.

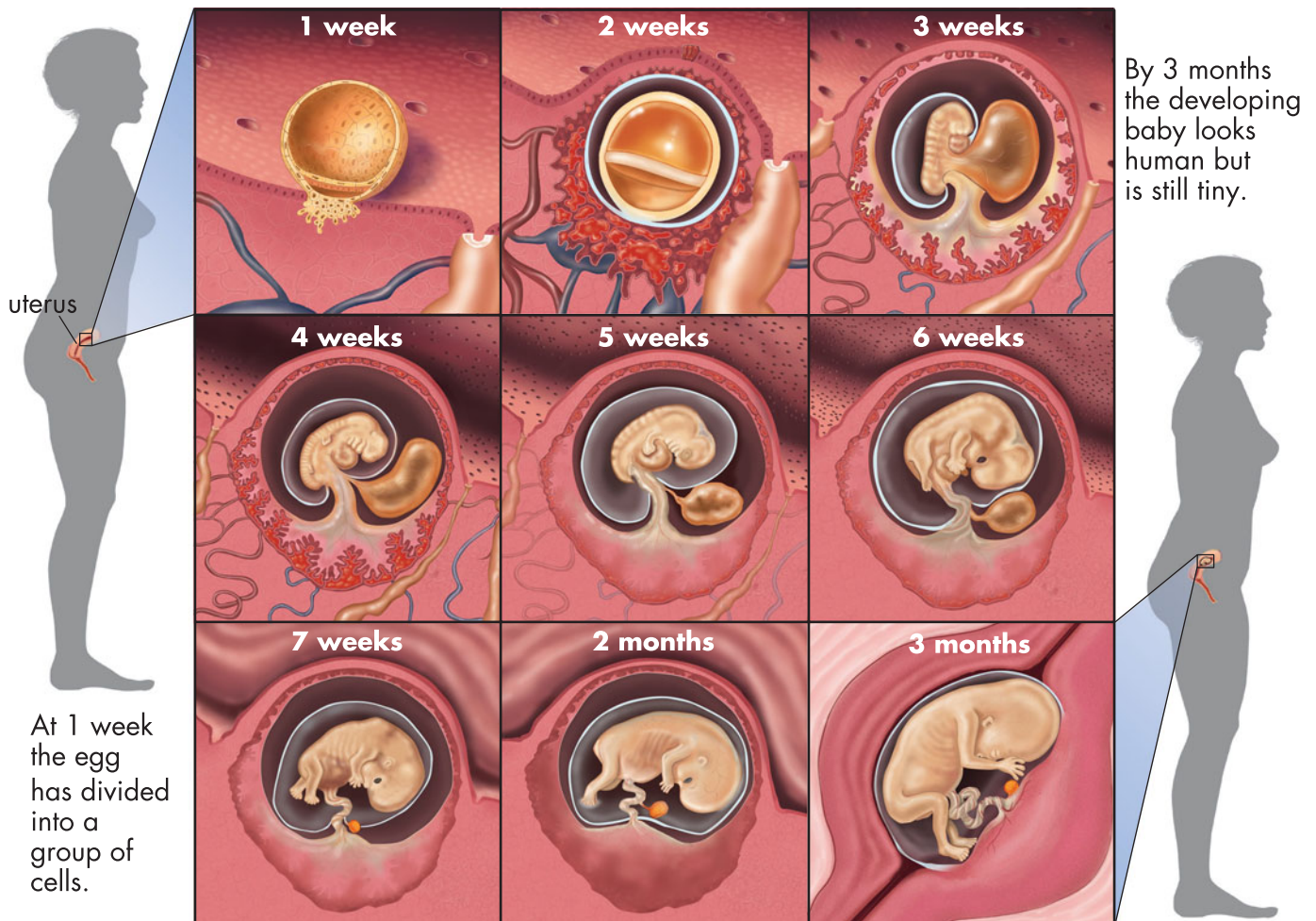
Fertilization, Pregnancy, and Birth

Sperm enter the woman's body through the vagina. The sperm swim up through the uterus and into the fallopian tubes. If an egg is in one of the fallopian tubes, the sperm try to join with it. Only one sperm can enter, or fertilize, the egg. The rest of the sperm die.

Once the egg is fertilized, pregnancy (or gestation) begins. The fertilized egg moves into the uterus. As it travels it

starts to divide into many more cells. After about five or six days these cells burrow into the wall of the uterus. There the cells begin to develop into a baby. At first the developing baby is called an embryo. After about eight weeks the baby is called a fetus.

In the uterus the baby grows inside a pouch called the amniotic sac. The amniotic sac is filled with clear liquid. The liquid protects the baby and lets it move around. A bundle of blood vessels, called the umbilical cord, connects the baby's belly to the placenta. The placenta is a structure



A human pregnancy lasts about nine months. A developing baby goes through many changes during the first three months.



From the fourth month to the ninth month of pregnancy, the developing baby grows much larger. The mother's uterus and belly greatly expand.

that lines part of the uterus. The placenta brings nourishment from the mother's body to the baby. It also takes away wastes from the baby.

After about nine months of development the baby is ready to leave the woman's body. The bottom end of the uterus, called the cervix, expands to create a wide opening into the vagina. The muscles of the uterus contract, or tighten, to push the baby downward. The baby moves slowly through the vagina and out of the mother's body.

When the baby is born the umbilical cord and the placenta also leave the mother's body. The newborn baby is cut free from the cord and the placenta. After several days the stump of the cord dries up and falls off the baby's belly. It

leaves behind an indentation called a navel, or belly button.

► More to explore

Egg • Gestation

Reptile

A reptile is an air-breathing animal that has scales instead of hair or feathers. Reptiles have lived on Earth for more than 280 million years. Scientists consider them to be the ancestors of birds and mammals.

Over the years many kinds of reptiles have become extinct, or died out. The dinosaurs are well-known reptiles that became extinct about 65 million years ago. Today there are about 6,000 species, or types, of living reptile. They

include snakes, lizards, turtles, alligators, and crocodiles.

Where Reptiles Live

Reptiles are found all over the world, except in very cold areas. The greatest number and variety are in the hot, humid tropics. Snakes and lizards live in many different kinds of places. They can live on land, in trees, in underground tunnels, or in water. Most turtles live in water but spend some time on land. Tortoises live only on land. Alligators and crocodiles spend most of their time in water, but they can make short trips on land.

Physical Features

Reptiles are vertebrates, or animals with a backbone. Except for snakes, most reptiles have four limbs. Reptiles vary greatly in size. Some snakes and lizards are less than 2 inches (5 centimeters) long. The largest crocodiles, pythons, and anacondas can grow to more than 30 feet (9 meters) long. The largest lizard is the Komodo dragon, which reaches a length of more than 10 feet (3



The flashy pattern of an adder's scales may warn predators to stay away. Adders are venomous, or poisonous, snakes.

meters). Leatherback turtles grow to more than 7 feet (2 meters) long.

Reptiles have dry skin that is covered with scales. Scales are hardened folds of the upper layer of skin. The scales of many lizards overlap. They are arranged side by side in snakes and alligators and crocodiles. Scales also cover the bony shells of turtles.

Reptiles shed and replace their scales throughout their lifetime. Some species shed often. Others shed several times a year. Snakes shed all their scales at once. Lizards, turtles, alligators, and crocodiles shed their scales one by one or in patches.

Behavior

Reptiles are cold-blooded animals. This means that their body temperature changes when the temperature around them changes. Reptiles warm or cool themselves by moving to warmer or cooler places. Most reptiles are inactive during winter. This is called hibernation.



Crocodiles lie on grass in Madagascar, a tropical island in the Indian Ocean.

Some are inactive during parts of the summer. This is known as estivation.

Most reptiles are meat eaters. They eat many kinds of animals, including insects, birds, frogs, mice, and fish. Some reptiles follow their prey. Others hide and wait for the prey to approach. Certain snakes shoot venom, or poison, into their prey. A few lizards and turtles eat only plants.

Reptiles have different ways of protecting themselves from their enemies. Rattlesnakes shake their tail rattle when they feel threatened. A cobra spreads its neck to look bigger. Some turtles hide in their shells. Crocodiles, turtles, and some lizards and snakes hiss loudly. Most reptiles bite when threatened.

Senses

Alligators, crocodiles, and most lizards hear fairly well. Snakes and turtles have trouble hearing. Instead they can feel vibrations in the ground. Some reptiles have poor eyesight. This is true of snakes and lizards that tunnel underground.

Reptiles taste and smell using special organs in the mouth or nose. Some snakes also have organs that are sensitive to heat. These organs can sense prey even in total darkness. This is because the bodies of mammals and birds give off heat.

Movement

Reptiles use various methods to move from place to place. Most lizards walk on four limbs. Some use only their hind limbs when running. Certain snakes and

legless lizards move by pushing their belly scales against rough surfaces and pulling the body forward. Some desert snakes use a type of movement called sidewinding. They repeatedly bend and lift the body to move across the sand.

Flippers or webbed feet help sea turtles swim. Sea snakes use their flattened tails like paddles in the water. Alligators and crocodiles swim by whipping their tails from side to side.

No living reptile can fly. However, some tropical snakes and lizards can glide from tall trees by flattening their bodies.

Life Cycle

Most reptiles lay eggs. Some lay just one egg. Others can lay up to 200. It usually takes about 60 to 105 days for the eggs to hatch. Certain snakes and lizards give birth to live young.

Most reptiles take at least a year to mature. Unlike mammals, reptiles may grow throughout their lives. Some reptiles live longer than any other vertebrates. Many species of reptile can live

Did You Know?

Some snakes and the stink-pot turtle let out foul odors to chase away enemies.



Flying lizards cannot really fly. But they can glide down easily from high places.



An eastern box turtle gets its first look at the world after hatching from a leathery egg. It is on its own and will get no care from its parents.

for more than 20 years in zoos. Certain turtles have lived for more than 100 years.

► More to explore

Alligator • Animal • Bird • Crocodile
• Dinosaur • Lizard • Snake • Turtle

Republic

A republic is a form of government in which the people elect, or choose, their leaders. In most countries with a republican government, the people elect the head of the government, such as a president. They also elect other people, called representatives, to make laws.

The leaders of a republic are responsible to the people who elected them. If the people do not like the way their leaders govern, they can vote them out of office. This means that the people are the source of power. This sets republics apart from countries led by a king or another all-powerful ruler.

Republics Today

Today most countries are true republics, meaning that the people choose their leaders. These republics practice a form of democracy. A democracy is any government in which the people have a say. The United States, Mexico, India, France, Kenya, South Korea, Peru, and Indonesia are only a few of the world's many true republics.

Some countries call themselves republics simply because a monarch (a king or a queen) is not the leader. They are not always democracies. For example, China calls itself a people's republic. But the Chinese people have no choice in who their leaders are.

Other countries practice democracy but are not really republics, either. In the United Kingdom the people vote for representatives in Parliament (the country's lawmaking body). But they also have a monarch. However, the monarch has little real power.



The president of Finland, Tarja Halonen, ran for reelection in 2006. In a republic, people elect their leaders.

History

The first republic was in ancient Rome. In 509 BC the Romans set up a republic that lasted for almost 500 years. A group of elected leaders called the Senate was the highest power in the government.

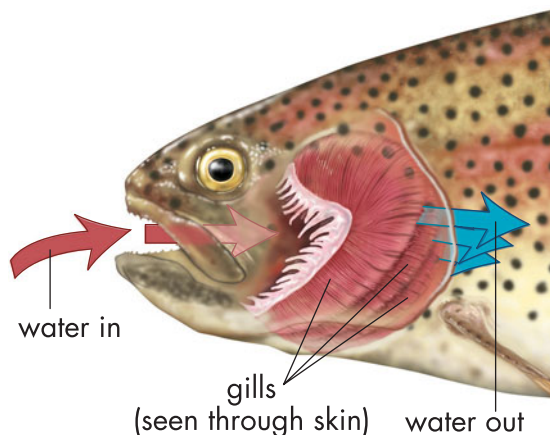
The next important democratic republics formed in the late 1700s. In 1788 the United States set up the first modern republic. An elected president leads the U.S. government. Groups of elected leaders called senators and representatives make the laws.

► More to explore

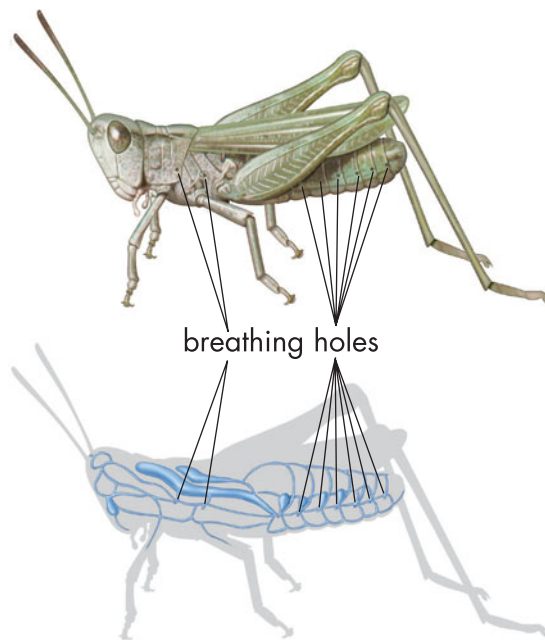
Democracy • Government • Monarchy
• Rome, Ancient • United States
Government

Respiratory System

All animals need a steady supply of oxygen in order to live. Oxygen is a gas found in air. It helps to turn food into energy. This process creates another gas—carbon dioxide. Carbon dioxide



Fish have gills instead of lungs. A fish takes in oxygen as water flows past its gills.



grasshopper respiratory system

Insects have no lungs. They use holes called spiracles and air sacs to breathe.

must be removed from the body. The respiratory system is the body's way of breathing in oxygen and breathing out carbon dioxide.

Insects breathe through holes in the sides of their bodies. Fish and young amphibians have organs called gills to take in oxygen from water. Mammals, birds, reptiles, and adult amphibians breathe through lungs.

The Human Respiratory System

The human respiratory system includes several parts: nasal cavity, throat, voice box, windpipe, bronchi, and lungs. Air enters this system through the nose. It then moves into the nasal cavity, a hollow space behind the nose. Air also enters through the mouth. These two airways meet at the upper part of the throat, called the pharynx.

From the pharynx, two passageways open downward. One is for food, and the other is for air. The passage for air contains the voice box, or larynx. Below the voice box is the windpipe, or trachea.

The trachea separates into two main branches, or bronchi—one for each lung. Within the lungs, the bronchi divide into smaller and smaller branches. The branches end with tiny air sacs called alveoli. There are more than 600 million alveoli in the lungs. The alveoli contain tiny blood vessels called capillaries.

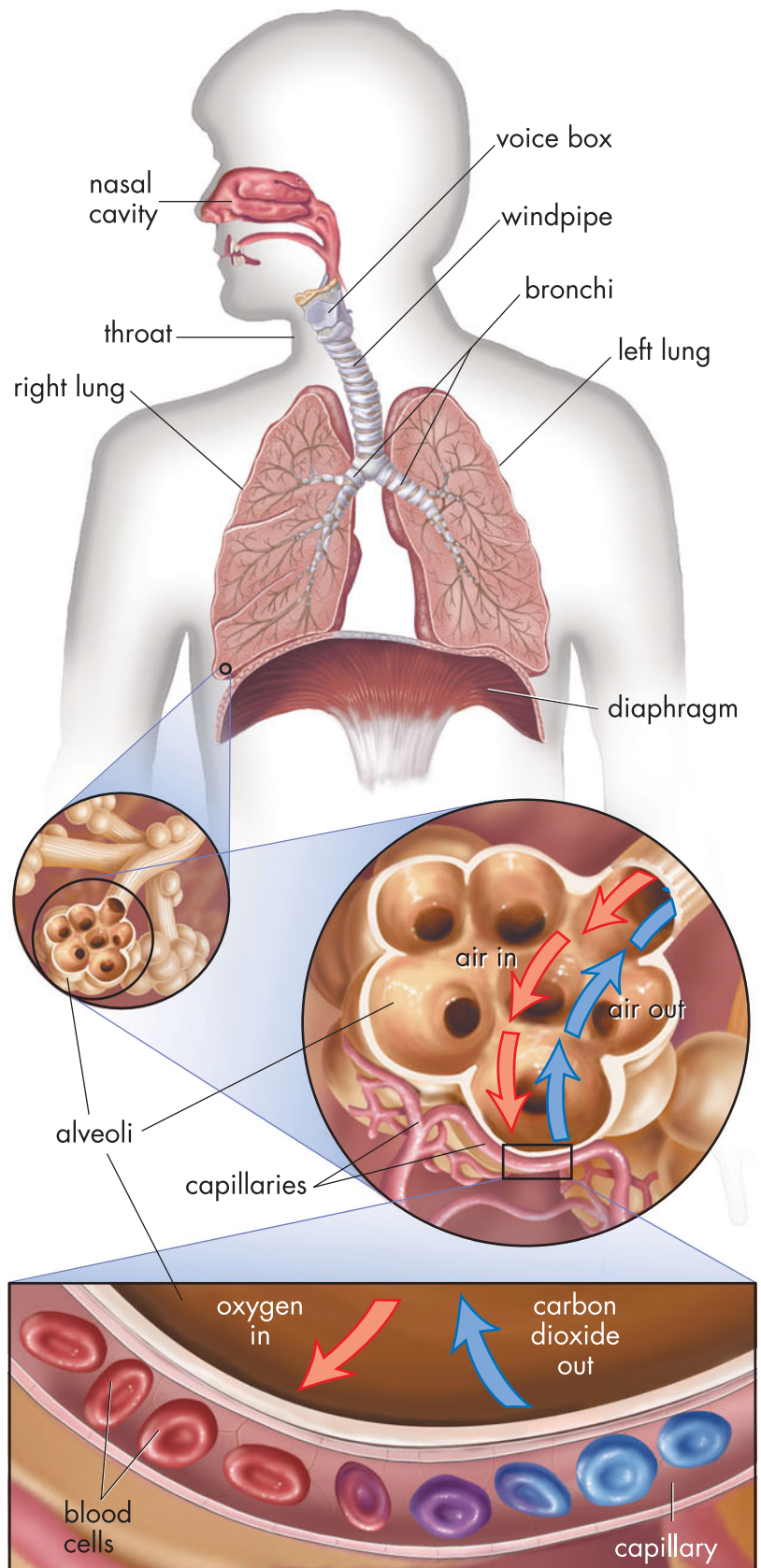
The Breathing Cycle

The brain controls breathing. It controls the diaphragm, a muscle at the base of the lungs. It also controls the muscles between the ribs.

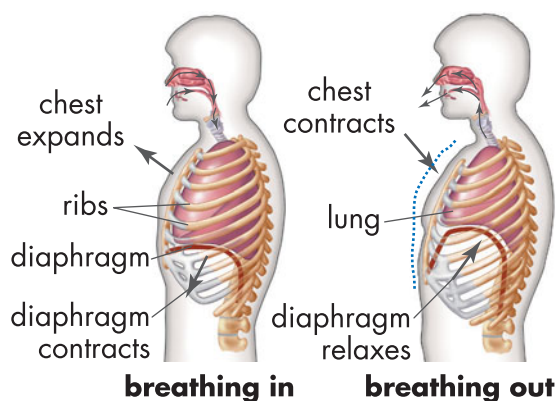
When the diaphragm moves down and the ribs move out, the area inside the chest grows larger. Air then flows into the lungs and makes them expand. Blood in the capillaries picks up oxygen from the air in the alveoli. The blood then brings the oxygen through the cardiovascular system to all parts of the body.

As the blood picks up oxygen, it also brings carbon dioxide from the body to the alveoli. The rib muscles and the diaphragm then relax. As the area inside the chest shrinks, the lungs decrease in size. The smaller size forces out air, including the carbon dioxide.

Newborn babies breathe up to 44 times a minute. Adults breathe only about 16



Tiny structures in the lungs called alveoli and capillaries exchange oxygen for carbon dioxide.



Diaphragm, ribs, and lungs all move when a person breathes in and out.

times per minute. When people are asleep, they breathe more slowly, about six to eight times per minute. If people are afraid or worried, they can breathe up to 100 times per minute.

Problems with the Respiratory System

Hiccups are a harmless problem with the respiratory system. They happen when the diaphragm moves in a fast, jerky way. Colds and influenza (the flu) are infections that start in the nose and the throat. Bronchitis is a swelling of the bronchi. Pneumonia is an infection of the lungs. Tuberculosis, emphysema, and lung cancer are serious diseases of the lungs.

► More to explore

Lung • Pneumonia • Tuberculosis

Réunion

The island of Réunion is a department (a type of province) of France. It lies near Africa in the Indian Ocean. Réunion's capital is Saint-Denis.

Geography

Réunion is about 420 miles (680 kilometers) east of Madagascar, an island country to the southeast of Africa. Réunion has many mountains. Some of them are active volcanoes. The island has a warm climate with dry and rainy seasons. Tropical storms called cyclones are common.

Plants and Animals

Réunion has many flowering plants and tropical fruit trees. Tropical forests grow in the higher areas. Animals on the island include chameleons, frogs, birds, and butterflies.

People

Many of the people of Réunion have a mixture of African, European, and South Asian roots. Whites and South Asians form other large groups. There are small groups of Chinese and Africans.

French is the language of government, but Creole is the language of everyday



A green valley lies between mountains in Réunion.

life. Roman Catholicism is the main religion. Most people live in cities or towns.

Economy

Services, especially tourism, are the most important part of Réunion's economy. The island also produces sugar, rum, and lobsters. Farmers grow sugarcane, fruits, vegetables, vanilla beans, tobacco, and geraniums, which are used to make perfume. Réunion trades mainly with France.

History

Portuguese explorers discovered the island in the 1500s. No one lived there until the 1600s, when the French built a settlement. The French brought Africans to work as slaves on coffee and sugar plantations. After slavery ended in 1848, workers from Asia arrived.

Réunion was a French colony until 1946, when it became a department of France. The people of Réunion then became citizens of France.

► More to explore

France • Indian Ocean

Revere, Paul

Paul Revere was a hero of the American Revolution. He is most famous for riding his horse through the countryside near Boston to warn the colonists that the British were coming. Revere was also a skilled silversmith (maker of silverware).



A painting shows Paul Revere holding a silver teapot that was made in his own workshop.

Paul Revere was born on January 1, 1735, in Boston, Massachusetts. His father's family was French and the family name was changed from De Revoire to Revere. Paul learned silversmithing from his father.

As a young man Revere joined the Sons of Liberty, a club for colonists who disliked British rule. Such people were known as patriots. In 1773 he and other patriots protested a tax on tea by throwing British tea into Boston Harbor. This action became known as the Boston Tea Party.

On April 16, 1775, Revere rode to warn the patriots of Concord, Massachusetts, to hide their weapons from the British. Two days later he rode again, from Boston to Lexington, Massachusetts. This time he warned the patriots John Han-

Did You Know?

Henry Wadsworth Longfellow's poem *Paul Revere's Ride* made that event an American legend.

cock and Samuel Adams that the British were coming to arrest them.

He also warned the Lexington minutemen that the British were coming. The minutemen were fighters who boasted that they needed only a minute to get ready. On April 19, the Lexington minutemen fought the battle that started the American Revolution.

During the war Revere set up a factory that made gunpowder for the military forces. He also served in the army, defending Boston Harbor. After the war, Revere returned to his work as a silversmith. He also manufactured copper sheeting. Paul Revere died on May 10, 1818, in Boston.

► **More to explore**

American Revolution • Minuteman

Revolution, American

► see American Revolution.

Revolution, French

► see French Revolution.

Revolution, Russian

► see Russian Revolution.

Reye's Syndrome

Reye's syndrome is a serious disease of children. Luckily it is not very common. But when doctors do not treat it right away, it can cause brain damage or even death. Some doctors believe that Reye's syndrome is brought on by a medicine called aspirin.

Reye's syndrome often strikes children who are getting over influenza, the common cold, or some other disease that is caused by a virus. The first symptom, or sign, of Reye's syndrome is frequent vomiting. Then the person might become tired and confused. Some people breathe rapidly and have violent muscle movements called convulsions. The person may finally fall into a coma, which is like a deep sleep from which someone cannot be awakened.

Doctors think that aspirin triggers Reye's syndrome. Some of a person's cells might have a problem that does not appear until the person takes aspirin. To prevent Reye's syndrome, doctors recommend that children under 12 do not take aspirin.

Reye's syndrome is a serious disease that requires a hospital stay. In the hospital, doctors give the person fluids and medicines to reduce brain swelling. The person also gets help with breathing. If the disease is treated early enough the person can usually make a full recovery.

► **More to explore**

Virus

Reykjavík



Population
(2008 estimate)
119,000

Reykjavík is the capital of Iceland, an island country in the North Atlantic Ocean. It is Iceland's largest city by far.

The name Reykjavík means “bay of smokes.” It refers to the steaming-hot water that spouts from the ground at nearby hot springs. Water piped from the hot springs is used to heat the city.

Reykjavík has many businesses and industries. The city is a fishing port. It has factories that process fish, other foods, and aluminum. However, most people work in service industries such as sales, banking, and health care.

According to legend a Viking founded Reykjavík in 874. It was a small fishing village until the 1900s.

Denmark began to rule Iceland in the late 1300s. In 1786 Reykjavík became the island's capital. Iceland's lawmakers have met in the city since 1845. In 1944 Iceland became an independent country with Reykjavík as its capital.

► **More to explore**
Iceland • Vikings

Rhinoceros

Rhinoceroses are heavy mammals with thick skin and hooves. There are five species, or types, of rhinoceros. Illegal hunting has left most of them in danger of dying out.

The Sumatran, the Javan, and the great Indian rhinoceroses are found in Asia. The black rhinoceros and the white, or square-lipped, rhinoceros are found in Africa.

Most rhinoceroses live by themselves. They generally live in grasslands or in marshes. The Sumatran rhinoceros prefers the forest.

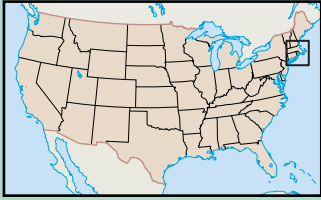
Rhinoceroses weigh 3 to 5 tons. They are about 8 to 13 feet (2.5 to 4 meters) long. Some have one horn on the top of the head. Others have two horns. The animals cannot see well, but they have a good sense of hearing and smell. They eat grass, reeds, and twigs.

► More to explore

Mammal



The black rhinoceros of Africa has two horns and is known for its bad temper.



Rhode Island

Rhode Island is the smallest U.S. state. It was one of the 13 original American Colonies. Its official name, The State of Rhode Island and Providence Plantations, dates back to colonial times. Providence was the first settlement and is now the state capital. Rhode Island's nickname, the Ocean State, comes from its coastline along the Atlantic Ocean.

Geography

Rhode Island lies in the northeastern part of the United States. It is one of the states in the New England region. The Atlantic Ocean borders the southern part of the state. Connecticut is to the west and Massachusetts is to the north and east. The eastern half of Rhode

Island is indented by the waters of Narragansett Bay.

Rhode Island has two natural regions. The western two thirds of the state lies within the Appalachian Mountains. It is a rough, hilly region with many forests and lakes. The rest of the state is a shallow lowland area that extends into southern Massachusetts. The lowlands include numerous islands, sandy beaches, and salt marshes. Rhode Island has a damp climate with short summers and long, cold winters.

People

Whites of European heritage make up more than four fifths of Rhode Island's population. The Hispanic population in Rhode Island has grown a great deal. It doubled between 1990 and 2000. During that period, Hispanics went from about 4.5 to almost 9 percent of the population. African Americans make up more than 4 percent of the population.

Economy

Tourism is one of the state's important service industries. Businesses in financial services, insurance, and real estate are also major parts of the economy. Rhode Island's most notable manufactured products are jewelry and silverware.

Harvesting shellfish and fish from the waters off Rhode Island is a vital industry. The most valuable shellfish are lobster and hard-shell clams. Plants grown in nurseries and greenhouses are Rhode





Boats anchor in Newport Harbor in Narragansett Bay, Rhode Island.

Island's leading source of income from agriculture.

History

The Narraganset tribe was the largest Native American group living in the area before Europeans arrived. Portuguese, Italian, and Dutch explorers and traders visited the region in the early 1500s. Roger Williams, a minister, and his followers founded Providence in 1636. They had left Massachusetts in search of religious freedom. In 1663 the king of England granted a charter that officially created the new colony in Rhode Island.

Before the American Revolution started in 1775, Rhode Islanders took part in the first violent protest against the Brit-

ish government. In 1772 a group of townspeople burned a British customs ship that had run aground in Narragansett Bay.

Rhode Island was one of the original 13 states of the Union. In 1790 it was the 13th, and therefore the last, state to ratify, or officially accept, the U.S. Constitution. The state ratified the Constitution only after the document included the Bill of Rights, which guaranteed individual liberties.

Rhode Island served as an operations center for the U.S. Navy during World War I (1914–18) and World War II (1939–45). As the home of the Naval War College, the state continues to play a role in military affairs.

► More to explore

Bill of Rights • Narraganset • Providence



The Breakers mansion overlooks the Atlantic Ocean in Newport, Rhode Island. It is one of several grand homes that draw visitors to the state.

Facts About RHODE ISLAND

Flag



Population
(2000 census)
1,048,319—
rank, 43rd state;
(2008 estimate)
1,050,788—
rank, 43rd state

Capital
Providence

Area
1,545 sq mi
(4,002 sq km)—
rank, 50th state

Statehood
May 29, 1790

Motto
Hope

State bird
Rhode Island red



State flower
Violet



Rhododendron



Gardeners prize rhododendrons for their beautiful flowers.

Rhododendrons are plants with beautiful flowers and glossy leaves. The name rhododendron comes from the Greek words for rose (*rhodon*) and tree (*dendron*).

There are more than 800 species, or types, of rhododendron. They can be found throughout the world except for Africa and South America. Many are found in the Himalayas and the mountains of Malaysia in Asia.

Most kinds of rhododendron are evergreen, meaning that they keep their leaves all year. However, some kinds lose their leaves each autumn. These kinds are usually called azaleas. Rhododendrons also vary greatly in size. Some are tiny shrubs or groundcover that are only 4 inches (10 centimeters) tall. Others are treelike plants that grow more than 40 feet (12 meters) tall.

Most rhododendrons have thick, leathery green leaves. The leaves can be round

or oval. The flowers are usually shaped like a tube or a funnel. They may be white, pink, red, purple, yellow, or blue. Some plants grow large clusters of flowers. Others have single flowers or smaller clusters of two or three blooms. A number of species are known for the strong fragrance, or smell, of their flowers.

► More to explore

Himalayas

Rhubarb

Rhubarb is a vegetable. It grows in long stalks with large leaves at the top. There are several species, or types, of rhubarb. They originally grew only in Asia. The plants are now found throughout the world, but they grow best in places with cool weather. Rhubarb plants are also called pieplants.

Rhubarb plants have green, heart-shaped leaves. Some of the leaves may have large veins or wrinkles. The leaves grow at the end of pink, green, red, or red-green stalks. In some types, the stalks can



The red stalks of a rhubarb plant can be cooked and eaten. The leaves are poisonous.

reach up to 2 feet (60 centimeters) long. After the leaves have grown, sometimes a separate flower stalk may appear. It may have tiny white, yellow, or greenish red flowers at the end of it.

Rhubarb stalks grow from a stem called a crown that grows under the soil. The roots also grow from the crown. Rhubarb roots can live through the winter. Fresh stalks will grow every year starting in early spring.

People use rhubarb in a variety of dishes. Only the stalks of the plant are eaten, however, because the leaves contain a poison. The stalks are crisp and have a tart flavor. Rhubarb is often cooked with sugar and used like a fruit in pies and preserves.

Rice

Rice is a grain that is the main food of about half the world's population. It belongs to the grass family. Its scientific name is *Oryza sativa*. The grain known as wild rice, despite its name, comes from a different plant.

Rice was first planted and grown in India more than 4,000 years ago. Today 90 percent of the world's rice is grown in Asia.

Most rice is grown underwater in paddies. A paddy is a bed of mud with low mud banks around it. The paddy is flooded with 2 to 4 inches (5 to 10 centimeters) of water. The paddy is kept flooded for most of the growing season.



Workers plant rice in a paddy in India.

The rice plant grows to about 4 feet (1.2 meters) tall. It has several stalks with long, flattened leaves. At the end of each stalk is a fan-shaped head made up of green and yellow flowers. These flowers produce the grains of rice.

After harvesting, rice must be processed, or milled. Milling removes outer layers of the rice grains. To produce brown rice, only the first layer, called the hull or husk, is removed. Another layer, called the bran, is removed to create white rice. Brown rice is much higher in nutrients than white rice. Enriched white rice has added B vitamins and minerals.

Rice is eaten alone and in a great variety of soups, side dishes, and main dishes. In eastern Asia people grind rice into flour to make rice cakes and pastry. The people of Japan, China, and India use rice to make liquor. The parts of the plant that are not eaten can be used to make mats, garments, baskets, fertilizer, fuel, and other products.

► More to explore

Grain • Grass

Richmond



Population
(2000 census),
city, 197,790;
(2007 estimate)
200,123

Richmond is the capital of the U.S. state of Virginia. It lies on the James River. It is a historic city that played an important role in the American Revolution and the American Civil War.

Richmond has a number of notable buildings. The state Capitol was designed by Thomas Jefferson, the third president of the United States. The home of John Marshall, the fourth chief justice of the U.S. Supreme Court, dates from 1790. St. John's Church is where the patriot Patrick Henry gave his famous "Liberty or Death" speech in 1775.

Most people in Richmond work in government or in trade, banking, or other service industries. Factories in the city

make tobacco and food products, chemicals, metals, and other goods.

In 1637 American colonists set up a trading post where Richmond is today. The town was built there in the 1730s. During the American Revolution, Richmond became the capital of Virginia. British troops raided the town in 1781.

Just before the American Civil War, Virginia and 10 other Southern states withdrew from the United States. In 1861 they formed a separate government called the Confederate States of America, or the Confederacy. Richmond became the capital of the Confederacy. In 1865 U.S. troops captured Richmond. Most of the city's business district was destroyed. After the war Richmond recovered rapidly.

► More to explore

American Civil War • American Revolution • Confederate States of America • Henry, Patrick • Virginia



Grand houses line a street in Richmond, the capital of Virginia.

Ride, Sally

Sally Ride was a U.S. astronaut. In 1983 she became the first U.S. woman to travel into outer space.

Sally Kristen Ride was born in Encino, California, on May 26, 1951. She graduated from Stanford University in northern California with four degrees, including a doctorate in physics.

In 1978 the National Aeronautics and Space Administration (NASA) selected Ride to train as an astronaut. After com-



Sally Ride sits in the cabin of the space shuttle *Challenger*.

pleting her training in 1979, she worked as a space shuttle mission specialist. On June 18, 1983, Ride made her first voyage into outer space aboard the space shuttle *Challenger*. The shuttle was in space for six days.

Ride took a second trip aboard the *Challenger* in 1984. During this mission Ride's friend Kathryn Sullivan became the first U.S. woman to walk in space. In 1986 the *Challenger* exploded as it was taking off for another mission. Ride was one of the astronauts who helped to investigate the explosion. Ride left NASA in 1987.

Ride later worked as the director of the California Space Institute at the University of California, San Diego. She also wrote several children's books about outer space. In 2003 Ride helped to investigate another space shuttle disaster after the shuttle *Columbia* broke up as it was returning to Earth.

► **More to explore**
Space Exploration

Riga



Population
(2008 estimate)
717,371

Riga is the capital of Latvia, a country in northeastern Europe. It is Latvia's largest city by far. It is also a major port. The city lies on the Western Dvina River near where it flows into the Baltic Sea.

Latvia's economy depends heavily on Riga. The city is a center of shipping and manufacturing. Factories in Riga make chemicals, cloth, processed foods, and wood products. Banking, trade, and other service industries are important to the city's economy.

Riga was established as a trading settlement in 1201. Poland took control of the city in 1581. Sweden captured Riga



People gather at outdoor restaurants and cafés among the old buildings of Riga.

in 1621. However, the Poles and the Swedes let the city govern itself. Russia took over Riga in the early 1700s.

In 1918 Latvia became an independent country with Riga as its capital. But the Soviet Union took control of Latvia in 1940. In 1991 Latvia broke away from the Soviet Union and became independent again. Riga remained its capital.

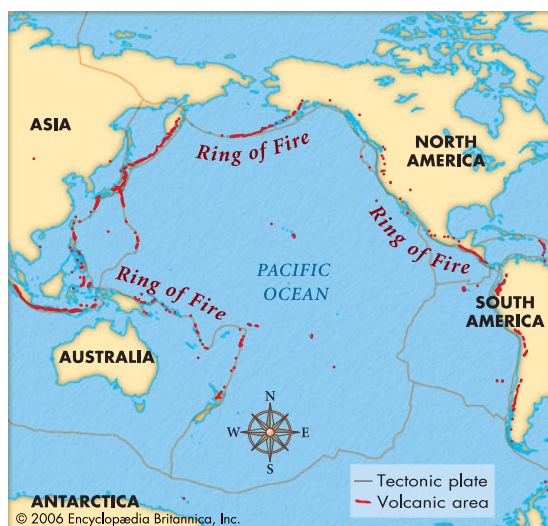
► More to explore

Latvia

Ring of Fire

A chain of volcanoes surrounds the Pacific Ocean. Because the volcanoes frequently erupt in fiery explosions, the region is known as the ring of fire. Many earthquakes occur in the region as well.

The chain passes along the west coast of North and South America. It runs along the Aleutian Islands and the islands of East and Southeast Asia. Then it extends east and south to New Zealand.



The ring of fire surrounds the edges of the giant Pacific Plate. A plate is a section of the rocky outer layer of Earth. Earth's plates move at different rates and in different directions. As the Pacific Plate and the plates around it grind into each other, they cause earthquakes and volcanoes.

► More to explore

Earthquake • Volcano

Rio de Janeiro



Population
(2007 estimate), city, 6,093,500; urban area, 11,563,302

Rio de Janeiro is a large city in Brazil, a country in South America. It is the second largest city in the country, after São Paulo. The city lies on the Atlantic Ocean. It is often called Rio for short.

Tourists flock to Rio for its beautiful beaches and for a yearly festival called Carnival. The city celebrates Carnival for four days before the Christian season of Lent begins. Lively parades and parties last day and night. People in colorful costumes sing and dance in Rio's streets.

Places of Interest

A large statue of Jesus called Christ the Redeemer overlooks Rio de Janeiro. It



Rio de Janeiro lies on a bay of the Atlantic Ocean. A towering rock called Sugar Loaf stands at the entrance of the bay.

stands on Mount Corcovado. A rock called Sugar Loaf is another major landmark. The rock offers great views of Rio's beaches below. Two of its best-known beaches are called Copacabana and Ipanema.

Economy

Tourism is a major part of Rio de Janeiro's economy. Banking, trade, and other services are also important. The city is one of Brazil's main manufacturing centers. Factories in Rio make clothing, medicines, metal products, and processed foods. The city is also a major port.

History

Portugal took control of Brazil in the 1500s. Many American Indians already lived in the Rio area. Portuguese sailors entered the area's harbor in January 1502. They thought it was the mouth of a river. Because of this they named the site Rio de Janeiro, which means "river of January." Portuguese settlers began moving there in the 1560s.

In the 1700s the Portuguese used Rio as a port to ship out gold and diamonds. In 1763 they made it the capital of their colony of Brazil. The city grew greatly.

Brazil became an independent country in 1822. Rio was its capital. In 1960 the capital was moved to the city of Brasília. However, Rio de Janeiro remained important to Brazil's economy.

► More to explore

Brasília • Brazil • São Paulo

River

A river is a large, natural stream of water that flows over land. Rivers shape the land by carving out canyons and other valleys. Humans have used rivers in many ways. Many ancient civilizations grew up near rivers.

River Courses

A river begins as a tiny trickle of water on high ground. The water may come from rainfall, from melting snow or ice, or from underground. The trickle com-



A boat pushes barges on the Mississippi River.

bines with other trickles as it flows downhill. It may be called a stream, a brook, or a creek.

Eventually the creek grows into a river. In its upper course the river flows rapidly. It cuts through the land and picks up soil and gravel. In its middle course the river flows down gentler slopes. It gets larger and slower. Soil, gravel, and sand begin to sink to the bottom.

In its lower course the river flows even more slowly. It drops still more solid material. Some material is carried all the way to the mouth—the place where the river enters the sea. This material may build up to form a piece of land called a delta.

River Systems

A river receives water from the smaller streams that flow into it. These streams are called tributaries. A river and its tributaries make up a river system. The area that a river system covers is called a basin. Rivers that are the same length may have basins of different sizes. The Amazon River is slightly shorter than the Nile River, but the Amazon has a basin more than twice as large.

Importance to Humans

Humans drink river water. They catch fish from rivers. They also use river water to grow crops. They often do this by digging ditches that carry water to farm fields. This practice is called irrigation.

Before modern times, people often traveled on rivers. Large riverboats called barges still carry grain, coal, and minerals.

Flooding creates problems for people who live near rivers. People have built dams across many rivers to control floods. As water flows through a dam it often runs through generators that create electricity.

People also put waste into rivers. This practice has made river pollution a serious problem.

► More to explore

Canyon • Dam • Delta • Flood
• Irrigation

Rivera, Diego

The Mexican artist Diego Rivera is known for creating large murals, or wall paintings. In his murals he represented



Diego Rivera painted a mural in San Francisco, California, that combines images of traditional Mexican art with images of modern North American technology.

scenes from Mexico's history, telling of its cultures, farming and industry, wars, and politics. His paintings feature bright colors and are crowded with people and symbols.

Rivera was born on December 8, 1886, in Guanajuato, Mexico. At age 10 he earned a scholarship to study art in Mexico City. In 1907 he won a scholarship that allowed him to travel to Europe. He studied art in Spain and then settled in Paris, France.

In Paris Rivera began painting in a style called cubism. In this style the subject is broken apart into basic shapes, such as squares, triangles, and circles. In about 1917 his style changed. He began to use simple forms and bold areas of color.

In 1921 Rivera returned to Mexico. He and the Mexican painter David Alfaro Siqueiros hoped to create a new kind of art especially for Mexico. They wanted to paint murals on buildings where everyone could see them. The murals would tell the stories of the Mexican people.

Rivera completed his first important mural in 1923. He was soon hired to paint murals on several public buildings in Mexico. Between 1930 and 1934 Rivera painted murals in the United States. He died on November 25, 1957, in Mexico City. Frida Kahlo, his wife, also was a famous painter.

► More to explore

Kahlo, Frida • Mexico • Painting

Riyadh



Population
(2007
estimate), urban
area,
4,465,000

Riyadh is the capital of Saudi Arabia, a country in the Middle East. It is the largest city in Saudi Arabia. Huge amounts of oil were discovered in the country in the middle of the 1900s. The Saudi government used money from the country's oil industry to turn Riyadh into a very modern city.

Factories in Riyadh process oil, cement, metals, and foods. The city is also a major center of business and banking.

Riyadh became the capital of the Sa'ud family lands in the early 1800s. In 1881 the Rashid family took control of the



A robed man walks in a garden in Riyadh, Saudi Arabia. The water tower behind him is a city landmark.

city. The Sa'ud family recaptured Riyadh in the early 1900s. They established Saudi Arabia as a unified country in 1932. Riyadh was the capital.

During the 1900s Riyadh grew greatly. Money from the oil industry was used to build modern hospitals, roads, and gleaming new office buildings. In the early 21st century the city was the site of several violent terrorist attacks.

► More to explore

Saudi Arabia

Road

Cars, trucks, buses, motorcycles, and bicycles travel on strips of land called roads. Some roads are made of dirt or gravel. A firm, strong material called pavement covers most modern roads. Types of roads include city streets, country roads, and long-distance highways.

How Roads Are Built

There are many steps in road building. First, road builders choose a route, or path, for the road. They must carefully study how the road will affect the businesses, homes, traffic, plants, and animals of the area. Next, road builders buy the land on which they will build the road.

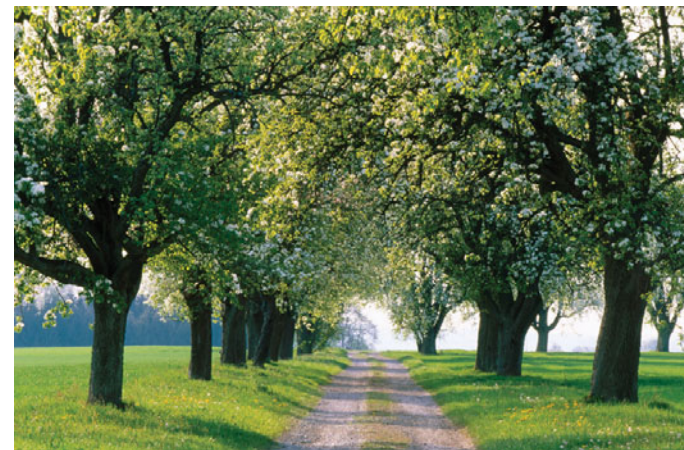
Construction of unpaved roads (roads without pavement) is simple. Builders clear away trees, bushes, and plants from the roadway—the strip of land over which the road will pass. Then they smooth out the roadway and press the surface down with a machine called a

roller. This type of road is suitable for areas where few cars travel.

Roads that many cars will use must be stronger than roads that have less traffic. These roads are paved. Paving materials include asphalt and concrete. Asphalt is a thick, dark, flexible material made from petroleum, or oil. Concrete is a mixture of cement, water, sand, and gravel. When it dries it becomes as hard as stone.

A strong road may start with a layer of asphalt. On top of the asphalt is a layer of sand, gravel, or crushed stone. A final layer of asphalt or concrete finishes the road. The concrete may have steel rods or mesh inside it for extra strength.

Most major modern roads are built with a gentle slope downward from the center of the road outward. This slope is called a crown. The crown allows water to run off the road. These roads also have a system for draining water away from the sides.



An unpaved country road makes a pretty picture. But such a road turns to mud in wet weather, and it cannot handle heavy traffic.

Did You Know?

The first major road was the Persian Royal Road in western Asia. It was more than 1,700 miles (2,700 kilometers) long and was used from about 3500 to 300 BC.

Roadrunner

Certain birds in the cuckoo family are called roadrunners. Roadrunners can fly, but they are rather clumsy in flight and get tired quickly. They prefer to dash around on their powerful legs. A roadrunner sometimes reaches speeds of more than 15 miles (24 kilometers) per hour. While running, it stretches out its neck, spreads out its short wings, and jerks its long tail up and down.

There are two kinds of roadrunner. The greater roadrunner lives in Mexico and the southwestern United States. The lesser roadrunner is found in Mexico and Central America. Most roadrunners live in deserts and other open areas without many trees.

The greater roadrunner is about 22 inches (56 centimeters) long. Its feathers are streaked in olive-brown and white. The lesser roadrunner is somewhat smaller and less streaked. Both kinds have a short tuft of shaggy feathers, called a crest, on the head.



Roadrunners are usually seen on the ground, where they feed on small animals.



Drivers use the ramps of a cloverleaf intersection to get on and off a long-distance highway. Cloverleafs cost so much money and take up so much land that they are usually spaced far apart.

History

Peoples in ancient Egypt and western Asia built the earliest roads more than 4,000 years ago. Later the ancient Romans became famous as road builders. They built roads paved with stone across Europe. The Spanish built the first roads in North America along Native American trails. Early roads in colonial America were usually dirt, sometimes covered with rows of logs.

Before automobiles were invented in the late 1800s, people used roads to travel by foot, by horse, and by wagon. As cars became popular in the early 1900s, people began building more roads paved with concrete and asphalt. In the 1950s the United States began building a system of large roads, called highways, across the country. Today highways cross many countries. But some poor countries still have mostly unpaved roads.

► **More to explore**
Automobile • Concrete

Roadrunners chase and catch lizards, snakes, mice, and insects for food. A roadrunner often holds an animal in its bill and pounds it to death against rocks.

► **More to explore**

Bird • Cuckoo

Robin

Robins are familiar and much-loved songbirds with reddish chest feathers. Several species, or types, of bird are called robins. The best-known types are the American robin and the European robin. Early European settlers in North America named the American robin after the European bird. Both these types belong to the thrush family, along with bluebirds and nightingales. But American and European robins are not closely related.

American and European robins were originally woodland birds. They are now also commonly found in gardens, on lawns, and in parks. American robins are found throughout most of North America. Most of them fly south for the



The American robin has a reddish breast and belly.



The European robin has a reddish face and breast.

winter. European robins are found throughout Europe and in parts of western Asia and northern Africa. Some of the robins of northern Europe fly south for the winter.

The American robin is about 10 inches (25 centimeters) long. It has an orange or dull reddish breast and belly. The head is black, and the upper parts are dark gray. Females and young males are paler than adult males.

The European robin is much smaller, with a length of about 5.5 inches (14 centimeters). It has orange-red feathers on its breast, throat, and face. The belly is white, and the upper parts are brownish olive.

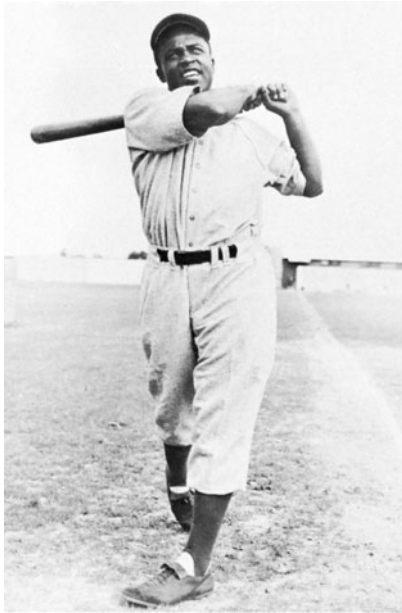
Both types of robin are often seen hopping across lawns. They look for worms or insects to pull up from the soil. American robins eat worms, insects, and

fruits. European robins eat mainly insects but also some worms, fruits, and seeds.

► More to explore

Bird • Bluebird • Nightingale • Songbird

Robinson, Jackie



Jackie Robinson played 10 seasons for the Brooklyn Dodgers. His lifetime batting average was .311.

Jackie Robinson was the first African American to play baseball in the modern era of the major leagues. He played as an infielder and outfielder for the Brooklyn Dodgers from 1947 through 1956.

Early Life

Jack Roosevelt Robinson was born on January 31, 1919, in Cairo, Georgia. He grew up in Pasadena, California. He was a star athlete in football, basketball, track, and baseball at the University of California at Los Angeles (UCLA).

From 1942 to 1945 he served in the U.S. Army.

After leaving the Army Robinson played baseball for the Kansas City Monarchs. The team belonged to the Negro American League. At that time only white players were allowed in the major leagues.

Major League Career

Branch Rickey, president of the Brooklyn Dodgers, was interested in making major league baseball open to black players. He knew that the first African American brought into the majors would have to be very special. When Rickey met Robinson, he knew he had found the right person. Robinson first played for the Dodgers in 1947. At the end of the season he was chosen as the best new player in baseball. In 1949 he was chosen as the most valuable player in the National League.

Although Robinson played well, things were not always easy. Players and people in the crowd often shouted hateful things at him. Pitchers sometimes threw the ball at him on purpose. But Robinson refused to quit.

Robinson helped the Dodgers win six National League pennants and one World Series title. He retired from baseball in 1957.

Later Years

Robinson then became a businessman and worked for civil rights. In 1962 he became the first black player in the Base-

Did You Know?

Jackie Robinson's tombstone reads, "A life is not important except in the impact it has on other lives."

ball Hall of Fame. Robinson died in Stamford, Connecticut, on October 24, 1972.

In 1997 Major League Baseball honored Robinson by retiring his number 42 jersey. No other major league player can wear that number.

► More to explore

African Americans • Baseball

Robot



Sony Corporation built a robot that can throw a baseball.

A robot is a machine that does tasks without the help of a person. Many people think of robots as machines that look and act like people. Most robots, though, do not look like people. And robots do only what a person has built them to do.

How Robots Work

Most robots are computer-controlled devices with many parts. An industrial

robot, for example, is an armlike machine that can turn at several joints. It has a handlike part to grasp and hold things. Motors move the parts.

Some robots can be “taught” to do a job. For example, a person might guide an industrial robot through the movements needed to do something. Sensors on the robot send signals about the movements to the computer. The computer stores the pattern of movements. Later the computer can retrieve the pattern and tell the robot what to do.

Uses

Most industrial robots are used in factories. Some robots load, move, and unload materials. Others are used on assembly lines to help build things such as cars and appliances.

Robots are especially useful because they can do things that could be dangerous for people. For example, they can be sent deep underwater or into space. Robots can also handle dangerous materials such as radioactive waste or harmful chemicals. They can even dispose of bombs or do spy work for the military.

History

Writings from ancient Greece and China tell of toys called automatons, which were like robots. They were set in motion by steam, air, water, or falling weights. In the late 1700s and early 1800s complex automatons could play music or write with a pen on paper. During this time people also built machines to help do certain kinds of work. Modern robots only came about

after computers were invented. With computers, people could program robots to do tasks on their own.

Robots in Science Fiction

Robots often appear in science fiction, or stories set in the future or in another world. Robots in science-fiction books, television shows, and movies can often think, listen, talk, and walk easily on two legs. Science-fiction robots that look exactly like humans are known as androids. Although real robots are becoming more complex, they still are not like these imagined robots.

► More to explore

Computer • Machine • Science Fiction

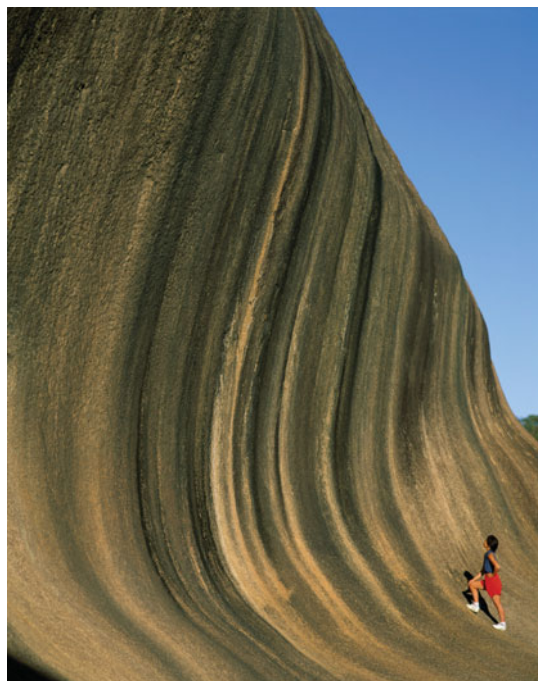
Rock

Rock, or stone, is a hard material made up of one or more minerals. Rock makes up the outer layer of Earth, called the crust. The lower parts of this layer are solid rock, or bedrock. Broken bits of rock lie on top. The tiniest bits of rock make up sand and soil. Underneath Earth's crust is a layer of melted rock, called magma.

Types of Rock

There are three types of rock: igneous, sedimentary, and metamorphic. These names describe how each type of rock was formed.

Igneous rock is hardened magma. Magma may escape through cracks in Earth's crust. It may also come to Earth's surface when a volcano erupts.



Wave Rock in Australia is a formation of granite, an igneous rock. The colored bands are not layers but stains.

As the escaped magma cools, it hardens into solid rock. Granite and basalt are examples of igneous rock.



Devils Postpile in California is a formation of basalt, an igneous rock. Lava slowly hardened to create the columns.



Limestone, a sedimentary rock, makes good paving blocks.

Sedimentary rock may form from pieces of other rock. In a process called erosion, wind and water slowly break rock into tiny pieces. Water washes the pieces into rivers. They settle along the river bottom in soft, loose layers called sediment. Over millions of years the sediment builds up, hardens, and becomes solid rock. Sandstone is a sedimentary rock that forms in this way. Sedimentary rock also may form from the remains of dead animals or plants. Limestone is a sedimentary rock that is made up of the



Slate is a metamorphic rock that splits off into flat layers.

shells and stony skeletons of certain kinds of living things.

Metamorphic rock forms from old igneous or sedimentary rock. Several forces can change old rock into new metamorphic rock. Great heat and pressure inside Earth's crust can shape old rock into metamorphic rock. Water can dissolve minerals in old rock or carry new minerals into it to form metamorphic rock. The heat of magma can also change old rock into metamorphic rock. Marble and slate are examples of metamorphic rock.

The Rock Cycle

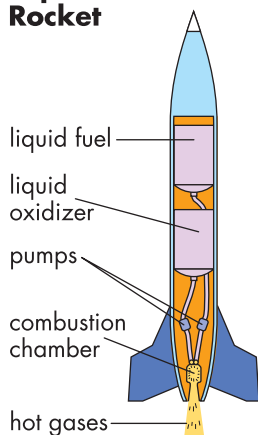
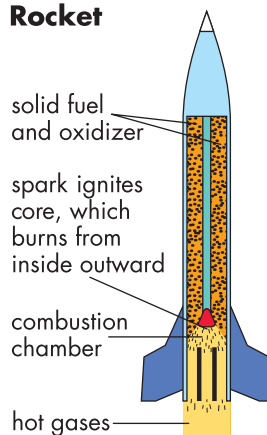
Rock is always being formed, worn down into pieces, and then formed again. This is called the rock cycle. Rock wears down through erosion. Pieces of rock then settle down and slowly become sedimentary rock. If sedimentary rock becomes deeply buried, it may melt into magma. Then the magma may return to the surface as igneous rock. Deeply buried rock may also become metamorphic rock. The rock cycle takes many millions of years.

► More to explore

Erosion • Mineral • Sand • Soil
• Volcano

Rocket

Rockets are devices that produce the force, or push, needed to move an object forward. Rockets are used to launch spacecraft. They are also used to shoot missiles and fireworks.

Liquid-Fuel Rocket**Solid-Fuel Rocket**

Rocket fuel can be liquid or solid. When the fuel burns, it gives off gas that pushes the rocket forward.

How Rockets Work

Rockets carry fuel that is burned inside a chamber. The fuel burns when it is mixed with oxygen gas and ignited, or set on fire. As the fuel burns, it gives off hot gas that shoots out from an opening at the back of the chamber. The force of the gas moving backward pushes the rocket forward. This action is called jet propulsion.

The engines of a jet airplane also use jet propulsion. But unlike a jet engine, rockets carry their own oxygen supply. This makes rockets valuable in outer space, where there is no oxygen.

Rocket fuel can be liquid or solid. The U.S. space shuttle uses both liquid and solid-fuel rockets. Two solid-fuel booster rockets launch the shuttle into space. Three liquid-fuel rocket engines allow it to move in and out of orbit.

History

The Chinese probably invented rockets in the 1200s. They made rockets by

filling bamboo cases with gunpowder. The Chinese used their rockets during religious ceremonies and as weapons. In the 1700s rockets were improved by making them with metal. Rockets were used as weapons in many wars of the 1800s and 1900s, especially World War II (1939–45).

In the late 1800s a Russian scientist named Konstantin E. Tsiolkovsky got the idea that rockets could be used to travel into space. He did not build any rockets, but his ideas about them were useful. Robert H. Goddard, a U.S. engineer, built the first liquid-fuel rocket in 1925. In October 1957 the Soviet Union used a rocket to launch the first spacecraft, Sputnik 1, into orbit around Earth.

► More to explore

Space Exploration • Weapon

Rock Music

Rock is a style of popular music. Since the 1950s, rock has probably had more fans than any other form of music.

Rock music has had many styles and forms over the years. One thing that most rock music has is a strong beat. Rock almost always focuses on the singer or singers. It often features electric guitars along with drums, electric bass, and sometimes piano or organ. Some rock musicians also use saxophones, trumpets, and other horns in their music. Rock music styles include country rock, heavy metal, alternative rock, punk rock, and many others.

Did You Know?

All speed and distance records—on land, in air, and in space—have been set by rocket systems.

The Early Days of Rock

Rock first appeared in the United States in the 1950s. In the early days it was called rock and roll. It developed from other music styles, especially African American popular music (called rhythm and blues), gospel music, and country music.

Chuck Berry was one of the first rock-and-roll singers and songwriters. Elvis Presley was the first rock-and-roll superstar. Other influential artists of the early period included Little Richard, Bill Haley, Bo Diddley, Fats Domino, Carl Perkins, Jerry Lee Lewis, and Buddy Holly. Teenagers were the biggest fans of rock and roll. Rock-and-roll songs expressed feelings in a way that young people thought was powerful and truthful. But many adults thought the music was too wild.



Rock musicians Lenny Kravitz (left) and Mick Jagger perform together at an awards ceremony.

Later Performers

After the late 1950s rock and roll changed into many forms. People began to call it simply rock music. It also spread to other parts of the world. In the early 1960s many British groups became popular. These included the Beatles, the Rolling Stones, and the Who. U.S. rock stars of the 1960s included the Beach Boys, Bob Dylan, Janis Joplin, the Grateful Dead, Jimi Hendrix, and Led Zeppelin.

Bruce Springsteen, Aerosmith, Kiss, the Police, the Talking Heads, and the Clash were just a few of the rock artists that appeared in the 1970s. In the 1980s such rock artists as Madonna, Prince, R.E.M., Guns N' Roses, U2, and the Red Hot Chili Peppers became famous. In the 1990s and early 21st century Nirvana, Pearl Jam, Radiohead, No Doubt, Coldplay, and Wilco were some of the top rock artists.

► More to explore

Beatles, The • Blues • Country Music
• Gospel Music • Popular Music
• Presley, Elvis

Rocky Mountains

The Rocky Mountains are a massive mountain range of western North America. They are called the Rockies for short. The Rockies include some of North America's highest peaks. In the past they formed a great barrier to explorers and settlers.



The Rockies are more than 3,000 miles (4,800 kilometers) long. They cover parts of the U.S. states of Montana, Idaho, Washington, Wyoming, Utah, Colorado, and New Mexico. In Canada, they extend into British Columbia, Alberta, and the Yukon and Northwest Territories. Sometimes Alaska's mountains are called part of the Rockies, too. Mount Elbert, in Colorado, is the highest peak. It is 14,433 feet (4,399 meters) high.

Rocky Mountain forests include aspen, white pine, Douglas fir, western hemlock, and western red cedar trees. The animals of the Rockies include bighorn sheep, mountain goats, mountain lions, American elk (wapiti), reindeer, and grizzly bears. Bald eagles, golden eagles, peregrine falcons, and other large birds soar above the mountains.

The spectacular scenery of the Rockies attracts many tourists. National parks of the region include Yellowstone, Jasper, Banff, Yoho, and Kootenay. The Rockies are also rich in minerals. Mines provide copper, gold, silver, lead, and zinc. There are also supplies of oil, natural gas, and coal.

Native Americans may have lived in the Rocky Mountain region as early as 12,000 years ago. The groups of the northern mountains included the Kootenai, the Shoshone, the Coeur d'Alene, and the Flathead. The Ute, the Navajo, the Hopi, and the Pueblo lived farther south.

The Rockies were one of the last parts of North America to be explored by Europeans. The rough terrain and harsh weather made exploration difficult. In 1793 the Scottish explorer Alexander Mackenzie crossed the Canadian Rockies. The Lewis and Clark Expedition



The climate in the Rocky Mountains varies widely. In summer only a short distance may separate warm foothills from frosty peaks.

crossed the Rockies in what are now Montana and Idaho in 1805.

► **More to explore**

Mountain • North America

Rodent

Rodents are mammals with long, sharp front teeth that they use for gnawing. They are found almost everywhere in the world. More than half the mammals on Earth are rodents. Rats, mice, squirrels, chipmunks, gerbils, hamsters, lemmings, beavers, guinea pigs, and porcupines are all rodents.

Most rodents are small. Some mice and dormice are only 3 inches (8 centimeters) long and weigh as little as 0.7 ounce (20 grams). The largest rodent by far is the capybara of South America. It can be 4 feet (1.3 meters) long and weigh more than 100 pounds (45 kilograms).



The capybara of South America is the largest rodent.

Rodents are different from other mammals because they have teeth that keep growing throughout their lives. They have one upper pair and one lower pair of these teeth, which are called incisors. Rodents spend much of their time gnawing, or nibbling at, hard objects to wear their incisors down. If the incisors grow too long, the rodent cannot eat. The incisors can even grow back into the skull and kill the animal.

Rodents can be pests. They can ruin farmers' crops and stored grains. Their gnawing can damage boards in houses, barns, or even metal telephone cables. Some rodents carry diseases that may infect people.

But some rodents are valuable to people. People use the fur of nutrias and chinchillas to make clothing. They keep hamsters, guinea pigs, and gerbils as pets. Mice, rats, and other rodents are useful in scientific research.

► **More to explore**

Beaver • Chipmunk • Gerbil • Guinea Pig • Hamster • Lemming • Mammal • Mouse • Porcupine • Rat • Squirrel

Roller Skating

Roller skating is a fun pastime and a competitive sport. Roller skaters wear shoes or boots with small wheels on the bottom. They skate outdoors on sidewalks and other paved areas. They also skate indoors in buildings called rinks.

Roller-skating sports include hockey, speed skating, figure skating, and danc-



Children enjoy in-line roller skating. They wear helmets and pads for protection from injury.

ing competitions. These are similar to traditional ice-skating sports. Today roller skaters also compete in “extreme” sports such as vertical skating. Vertical skaters jump from ramps and perform tricks in the air.

Roller skates were invented in the 1760s. Early skates were modeled on the ice skate. They had an in-line arrangement of wheels. This means that the wheels formed a single straight line along the bottom of the skate, where the blade is on an ice skate. Skaters found it hard to turn or stop while using these early skates.

In 1863 James Plimpton of the United States designed the first roller skates that were widely used. Plimpton’s skates had four wheels arranged in a rectangular pattern. This design made it easier for skaters to turn. Other changes in the late

1800s helped in braking and created a smoother ride.

The improved skates helped to make roller skating very popular in the early 1900s. In the 1960s plastic wheels began to replace metal ones. The plastic wheels gripped the skating surface better. A new type of in-line skates, often called Rollerblades, became popular in the 1980s.

► More to explore

Ice Skating • Skating

Rom

A Rom is a member of the group of people called Roma. The Roma have traditionally been nomads, moving from place to place. They originally came from northern India. Today most Roma live in Europe, especially the Czech Republic, Slovakia, Hungary, Serbia, Montenegro, Bulgaria, and Romania. There are about 8 to 10 million Roma in Europe. Roma are also known as Gypsies.



Roma play music and dance at a festival in the Czech Republic.

Did You Know?

The Roma are the largest minority group in Europe.

The Rom language is called Romany. Romany is based on Sanskrit, the ancient language of India. Roma also usually speak the main language of the country in which they live.

Not all Roma are nomads. Some have settled in cities and blended in with the population. The Roma who are nomads travel together in small bands. Some travel by car and sleep in tents or trailers at night. A few still travel and live in caravans, or horse-drawn wagons. Sometimes traveling Roma live for a while in houses, apartments, and even empty stores.

Nomadic Roma usually hold jobs that fit in with their wandering lifestyle. Some modern Roma make money by fortune-telling, playing music, or selling used cars and trailers. In the past Roma sold livestock and helped farmers with animal care. They also repaired pots, pans, and other metal products.

Roma first traveled beyond northern India in about the year 1000. They moved into Persia (Iran) and Armenia. They reached eastern Europe by the 1300s and western Europe by the 1400s. By the second half of the 1900s Roma had spread to North America, South America, and Australia. At times Roma have been mistreated or even killed just because of their ethnic background. Today some countries are working to improve conditions for Roma.

► More to explore

Nomad

Roman Catholicism

Roman Catholicism is the oldest and largest branch of Christianity. There are more than 1 billion Catholics worldwide. The Roman Catholic church is led by the pope. The pope rules the church from Vatican City, which is a separate country inside Rome, Italy.

Beliefs and Practices

Like all Christians, Catholics base their beliefs on the Christian Bible. For example, they believe that Jesus was the son of God. Roman Catholics also believe that Mary, the mother of Jesus, is a very important holy person. Unlike Protestant Christians, Catholics pray to Mary. Catholics also pray to a number of saints. Saints are men and women who did great deeds to support the Catholic church.

Roman Catholics generally attend a service called Mass on Sunday mornings.



A Roman Catholic priest holds up bread and wine during a Mass. Roman Catholics eat bread and drink wine during a ritual called Communion.

Catholics also perform rituals, or special signs of their faith, called sacraments. One sacrament is Communion. During a Mass a priest blesses bread. Catholics believe that the bread then turns into Jesus' body. At Communion Catholics eat the bread.

History

The history of the Roman Catholic church goes back to the beginning of Christianity about 2,000 years ago. After Jesus' death, Christianity spread throughout the Middle East and Europe. At that time the Roman Empire ruled these regions. At first the Romans had their own religion, and they often mistreated Christians. But in the AD 300s the Romans made Christianity their main religion.

The western part of the Roman Empire was conquered in the 400s, but Christianity stayed strong. The city of Rome remained the center of the church. The leaders of the church gained more and more power. They came to be known as bishops. Eventually the bishop of Rome gained the title of pope. He became the head of the entire church. Today a special group of bishops called cardinals elects the pope.

After the western part of the Roman Empire came to an end, the eastern part continued as the Byzantine Empire. The bishops there began to disagree with the popes. Finally the eastern and western parts of the church split in 1054. The eastern part became the Eastern Orthodox churches. The western part became the Roman Catholic church.



Worshippers attend mass at a Roman Catholic church in South Africa. In the late 20th century the church gained many new followers in Africa, Latin America, and parts of Asia. By the early 21st century about two thirds of all Catholics lived in those areas.

The Roman Catholic church was the most powerful organization in western Europe for hundreds of years. At times, however, more than one person claimed to be the pope. From 1378 to 1417 there were rival popes at Rome and Avignon, France. This period was called the Great Western Schism.

In the 1500s people who disagreed with church teachings began to form new Christian churches. This movement was called the Protestant Reformation.

Meanwhile European explorers and settlers brought Roman Catholicism to the Americas. Catholic missionaries (people working to spread their religion) also helped to spread Roman Catholicism around the world.

► More to explore

Bible • Christianity • Pope • Rome, Ancient



Romania

Romania is the largest country on the Balkan Peninsula in eastern Europe. Romania's name came from the Roman Empire, which ruled the region in ancient times. Bucharest is Romania's capital and largest city.

Geography

Romania borders Bulgaria, Serbia, Hungary, Ukraine, and Moldova. The Black Sea lies to the southeast.

The Carpathian Mountains run through the northern parts of Romania. The Carpathians surround a central region called Transylvania. Plains cover southern Romania. The Danube River flows along Romania's southern border.

Plants and Animals

The Carpathians have many forests. Oak trees grow on the low mountain slopes. Beech, fir, and spruce trees grow



Mountains and rolling hills cover large parts of Romania.

in higher areas. Grasses and scattered trees grow on the plains.

The goatlike chamois lives high in Romania's mountains. Brown bears, red deer, wolves, foxes, wild pigs, and lynx live in the forests. The country's birds include eagles, vultures, and hawks.

People

Most of the people of Romania are Romanians. Their language, called Romanian, has its roots in Latin—the language of the Roman Empire. The country has smaller groups of Hungarians, Roma (Gypsies), Germans, and Ukrainians. Most Romanians are Eastern Orthodox Christians. More than half of the population lives in cities or towns.

Economy

Services—including banking, communications, and health care—are



a major part of Romania's economy. Manufacturing, mining, and logging are also important. Factories make machines, fuels, steel, chemicals, and clothing. Mines provide coal, natural gas, and oil.

Many Romanians still live by farming. Crops include wheat, corn, potatoes, and sugar beets. Romanians also grow grapes to make wine. The main livestock are sheep and pigs.

History

The region that is now Romania was known as Dacia in ancient times. The Roman Empire ruled Dacia from AD 106 until the late 200s. Over the next 800 years Goths, Huns, Slavs, and other peoples invaded Dacia. In the 1000s the Hungarians took over what is now Transylvania.

The Formation of Romania

In the early 1300s the people south of the Carpathian Mountains formed a state called Walachia. The people east of the Carpathians formed a state called



Sheep graze near a castle in Romania.

Moldavia. Walachia and Moldavia were the first Romanian states.

In 1859 Walachia and Moldavia elected a single prince to rule both of them. The two states became the independent state of Romania. Romania gained Transylvania from Hungary in 1918.

Communist Rule

The Soviet Union took control of Romania during World War II (1939–45). The Soviets helped to set up a Communist government in Romania by 1948. The Communist leader Nicolae Ceausescu ruled harshly during the 1970s and 1980s. In 1989 Communist governments in neighboring countries began to collapse. That December the Romanian military executed Ceausescu.

Modern Romania

Romania held free elections in 1990. The new leaders worked to improve the economy.

► More to explore

Balkan Peninsula • Bucharest
• Communism • Moldova

Facts About ROMANIA



Population
(2008 estimate)
21,508,000

Area
92,043 sq mi
(238,391 sq km)

Capital
Bucharest

Form of government
Republic

Major cities
Bucharest, Iasi,
Cluj-Napoca,
Timisoara, Con-
stanta, Craiova



Romanian dancers perform at a folk festival.

Roman Numerals



Roman numerals are often used on clocks.

Roman numerals are a system for representing numbers with letters of the Latin, or Roman, alphabet. The system dates back about 2,000 years, to the time of ancient Rome. Roman numerals have been mostly replaced by Arabic numbers (1, 2, 3...).

How Roman Numerals Work

The Roman numeral system uses seven letters as numerals: I = 1; V = 5; X = 10; L = 50; C = 100; D = 500; M = 1,000. The numerals can be written as either capital or lowercase letters. A bar over a numeral multiplies its value by 1,000: for example, \overline{V} = 5,000 and \overline{X} = 10,000.

When a numeral is followed by one of equal or lesser value, their values are added together: II = 2; VI = 6; CLV =

155. This system could create very long numbers if numerals could be repeated without limit (for example, IIII or CCCC). To avoid this problem, the system uses subtraction within the numbers. A numeral is never used more than three times in a row. Instead of repeating the numeral a fourth time, the value is expressed by a smaller numeral followed by a larger numeral. The smaller numeral is subtracted from the larger one. For example, instead of IIII, the number 4 is written as IV (5 – 1). The number 400 is written as CD (500 – 100).

Only certain combinations of numerals are used in this way. For instance, 1,999 is written in Roman numerals as MCMXCIX rather than MIM. This number breaks down as follows: M (1,000) + CM (900) + XC (90) + IX (9). The number 2,000 is written MM; 2,001 is MMI; 2,002 is MMII; 2,003 is MMIII; 2,004 is MMIV; and 2,005 is MMV.

Using Roman Numerals

People generally find Arabic numbers easier to use than Roman numerals. But Roman numerals are still used decoratively on some clocks and watches. They are used to indicate dates on monuments and buildings. They are also used to number the front pages of books. Kings, queens, and popes who have the same name often put Roman numerals after their name.

► More to explore

Numbers and Number Systems • Rome, Ancient

Rome



Population
(2007 estimate)
2,705,603;
urban area,
3,339,000

Rome is the capital of Italy, a country in southern Europe. In ancient times it was the capital of the mighty Roman Empire. Today the city is a center of culture and tourism. People from all over the world travel to Rome to see its historic monuments and art treasures.

Rome lies on the Tiber River. It was built on seven hills. Rome surrounds Vatican City, the center of Roman Catholicism. Vatican City has been an independent country since 1929.

Places of Interest

Rome is filled with notable palaces, churches, and public squares called piazzas. The city also has more than 300 public fountains. Museums such as the Borghese Gallery display famous works of art.

The remains of many ancient monuments still stand in Rome. The Colosseum was an outdoor arena with rings of seats. Fighters called gladiators fought fierce battles there. The buildings of the Roman Forum were the center of public life in ancient Rome. Ancient art can also be seen in the Capitoline Museums.

Economy

The economy of Rome is largely based on government and tourism. Other leading industries include construction, publishing, and services such as banking and trade. The city also has some manufacturing.

History

People settled in the Rome area more than 2,700 years ago. In the 500s BC the city became a state called a republic. Soon Rome began taking over other lands. By the 1st century AD the republic had become a huge and powerful empire. Rome was the capital of the Roman Empire until AD 330.

In the 500s the pope—the leader of the Roman Catholic church—began taking control of Rome and the surrounding area. The popes ruled Rome for hundreds of years.

In the 1400s and 1500s Rome was a center of the artistic movement called the Renaissance. Great artists created



Trevi Fountain is one of the most famous sights in Rome, Italy. A legend says that visitors who throw a coin into the fountain will return to Rome one day.

buildings, paintings, and sculptures throughout the city.

In 1861 the Kingdom of Italy was created. But the pope still ruled Rome. In 1870 Italian troops marched into Rome. The city then became the capital of Italy.

► More to explore

Gladiator • Italy • Renaissance • Roman Catholicism • Rome, Ancient • Vatican City

Rome, Ancient

The ancient city of Rome was the center of one of the largest and most powerful empires the world has ever seen. The Roman Empire was based in what is now Italy. With its great army, it conquered other lands and peoples around

the Mediterranean Sea. The empire spread across Europe and into western Asia and northern Africa.

Roman Culture

Ancient Rome made many lasting contributions to world culture. But the Romans also absorbed the culture of the peoples they conquered. For instance, the Romans took many ideas about art from the ancient Greeks. Romans also worshipped many Greek gods, which they gave new names. Later, Rome adopted Christianity, a religion from the Middle East.

Painting, sculpture, and other forms of art were important to the Romans. Architects built huge buildings that were central to Roman life, including the Colosseum.





The ancient Romans created many designs called mosaics out of tiny tiles. The ones that survived show what everyday life was like in ancient Rome.

Roman writers wrote history, comedy, tragedy, and poetry. From Latin, the ancient Roman language, many other languages later developed. These languages, known as the Romance languages, include French, Spanish, Portuguese, Italian, and Romanian. People today use the Latin alphabet to write these and other Western languages, including English.

History

Kingdom

According to legend, twin brothers named Romulus and Remus founded Rome in 753 BC. Shortly before 600 BC, warriors from Etruria, a region north of Rome, attacked the city. The warriors, called Etruscans, conquered Rome. Rome grew steadily under Etruscan kings. In about 509 BC the Romans

forced the last Etruscan king out of the city. Rome then became a republic. This meant that the Roman people elected the government.

Republic

The most important Roman leaders were called consuls. There were two consuls. Assemblies, or groups, of adult male Roman citizens chose both consuls. At first the consuls had to be patricians, or members of upper-class families.

An important group called the Senate gave advice to the consuls. The members, called senators, were patricians. They met in a public building called the Forum. The Senate grew more powerful over the years.

Most Romans were not patricians but plebeians, or common people. The plebeians staged an uprising in 494 BC. They gradually won more power. By 367 BC one of the two consul positions was set aside for the plebeians.

Rome suffered some setbacks as it slowly expanded its territory. In about 390 BC a northern group called the Gauls took over the city. They would not leave until the Romans paid them a large amount of gold. Another group called the Samnites defeated the Romans in 321 BC. In general, however, Rome's conquests could not be stopped. By 275 BC Rome had forced the Greeks to give up their colonies in Italy.

By 260 BC Rome's last remaining rival in the western Mediterranean was the city of Carthage, in North Africa. For more

Did You Know?

The Appian Way was a famous ancient Roman road. It went to southern Italy and was paved with stone blocks. It was about 360 miles (580 kilometers) long.

than a century the Romans fought Carthage for power. It took three wars—called the Punic Wars—before the Roman forces totally destroyed Carthage in 146 BC.

Rome then turned to other areas, including Sicily, Spain, Macedonia, Greece, and Asia Minor (now Turkey). Governors called proconsuls managed most of the conquered lands. They had great power. The Romans taxed the conquered people heavily. They also enslaved many conquered people.

Empire

In about 133 BC Rome entered a period of unrest and civil war. Peoples in Italy rebelled against Rome's strict rule in 90 BC. During 73–71 BC a gladiator, or professional fighter, named Spartacus led an army of runaway slaves in a war against Rome. Rome defeated both of these rebellions.



The Colosseum was completed in AD 82. It was the scene of many public gatherings almost 2,000 years ago. Much of it still stands in the city of Rome.

Meanwhile, Rome continued to expand its empire. The most successful general was Julius Caesar. He won victories in far-off areas and then took power in Rome. However, his enemies assassinated him in 44 BC. This set off another period of civil war.

Peace finally came under the leadership of Julius Caesar's grandnephew Octavian. Octavian defeated his rivals for power, including the Roman general Mark Antony and the Egyptian queen Cleopatra, by 30 BC. He was crowned Rome's first emperor in 27 BC. He became known as Augustus Caesar.

Two centuries of peace and progress followed. The empire's frontiers expanded all the way to Britain and the Arabian Peninsula. The Romans built roads, bridges, and aqueducts, or water pipes, throughout their vast empire. They also brought their laws to conquered lands.

The emperor Tiberius ruled from AD 14 to 37. During this time the Roman government in Palestine put Jesus to death. Some of Jesus' followers, called Christians, later set up a community in Rome. At first the Romans did not agree with the Christian religion. They mistreated and killed many Christians. But in AD 312 the emperor Constantine I became a Christian himself. Christianity eventually became the main religion of the Roman Empire.

Downfall

By this time, the empire was weakening. Constantine believed he could

strengthen the empire if he moved its center away from Rome. In 330 he created a new capital in the Greek colony of Byzantium. He renamed the city Constantinople.

After the death of the emperor Theodosius I in 395, the Roman Empire split in two. The Eastern Roman Empire was based in Constantinople. The Western Roman Empire was based in Rome. Several groups of outside peoples, including the Vandals and the Huns, attacked the western empire. A group called the Visigoths attacked the city of Rome in 410. The last western emperor fell in 476. This brought an end to the Western Roman Empire. The eastern empire continued as the Byzantine Empire until 1453.

► More to explore

Augustus • Byzantine Empire • Caesar, Julius • Carthage • Christianity • Empire • Greece, Ancient • Rome

Roosevelt, Eleanor

Eleanor Roosevelt was married to Franklin D. Roosevelt, who was president of the United States from 1933 to 1945. She was widely respected for her many activities as first lady. Later she worked at the United Nations helping people around the world.

Anna Eleanor Roosevelt was born on October 11, 1884, in New York City. She grew up in a wealthy family that valued community service. Eleanor was



Eleanor Roosevelt

the niece of Theodore Roosevelt, the 26th president of the United States. In 1905 she married Franklin Roosevelt, her distant cousin.

During World War I (1914–18) Eleanor worked for the Red Cross. Later she taught at a girls' school that she partly owned. In the 1920s Eleanor became active in politics.

Franklin D. Roosevelt became president in 1933. He had a disability that made it hard for him to travel. Eleanor crisscrossed the country in his place. She talked to people from all walks of life and reported back to the president. She defended the rights of African Americans, youth, women, and the poor.

During the 1930s the United States was struggling through the Great Depression. President Roosevelt tried to end the country's economic problems with a group of government programs called the New Deal. Eleanor organized a New

Deal program called the National Youth Administration. It created jobs for millions of college students.

Franklin Roosevelt died in 1945, but Eleanor Roosevelt remained active. In 1945 she became a U.S. representative at the United Nations. There she worked to protect human rights. She also wrote books, magazine articles, and newspaper columns. She died in New York City on November 7, 1962.

► More to explore

Human Rights • New Deal • Roosevelt, Franklin D. • United Nations

Roosevelt, Franklin D.

Franklin D. Roosevelt served for 12 years as the 32nd president of the United States. He was elected four times beginning in 1932. Roosevelt led the



Franklin D. Roosevelt was the 32nd president of the United States.

country through two of the greatest crises of the 20th century: the Great Depression and World War II.

Early Life

Franklin Delano Roosevelt was born on January 30, 1882, in Hyde Park, New York. He was the only child of wealthy parents, James and Sara Delano Roosevelt. In 1900 he enrolled at Harvard University. While there he became engaged to Eleanor Roosevelt, a distant cousin and the niece of President Theodore Roosevelt. The couple married in 1905 and had six children. After graduating from Harvard, Franklin attended Columbia University Law School. He then worked as a clerk for a New York law firm.

Political Career

In 1910 Roosevelt was elected as a Democrat to the New York Senate. In 1912 President Woodrow Wilson made Roosevelt assistant secretary of the Navy. During World War I (1914–18) Roosevelt helped lead the Navy to victory over German sea forces. In 1920 Roosevelt ran for vice president, but the Democrats lost the election.

In 1921 Roosevelt caught poliomyelitis, a disease that paralyzed him from the waist down. In later years he could walk a little using a cane and leg braces, but he usually used a wheelchair.

In 1928 and again in 1930 Roosevelt was elected governor of New York. As the Great Depression began, Roosevelt introduced programs to help people without jobs.



TIMELINE

Roosevelt is born in Hyde Park, New York.

January 30, 1882

Roosevelt is elected to the first of his four presidential terms.

1929

The Great Depression begins while Roosevelt is governor of New York.

The United States enters World War II.

1932

Roosevelt launches the New Deal.

1933

Roosevelt dies in office.

1941

Roosevelt meets with British and Soviet leaders to plan the end of the war.

February 1945

April 12, 1945

Presidency

The Democratic Party chose Roosevelt to run for president in 1932. With the depression worsening, Roosevelt promised a “new deal” for millions of poor people. He won an easy victory over his Republican opponent, President Herbert Hoover.

By the time Roosevelt took office in March 1933, about 13 million people were unemployed in the United States. Roosevelt began his New Deal programs by making sure banks did not go out of business and by creating work for the jobless. In 1935 he asked Congress to pass the Social Security Act, which provided money to people who were unemployed, disabled, or elderly.

Roosevelt easily won reelection in 1936. By the time he began his second term in 1937, the economy had greatly improved. By 1938 the New Deal was coming to a close.

In 1939 World War II began in Europe. In a special session called by Roosevelt, Congress agreed to send weapons to Great Britain and France. In 1940 Roosevelt became the first U.S. president to run for and win a third term.

On December 7, 1941, Japan bombed a U.S. military base in Pearl Harbor, Hawaii. The surprise attack brought the United States into the war. It joined Britain against Japan, Germany, and Italy.

Roosevelt worked with British leader Winston Churchill to plan the war effort. Later, Soviet leader Joseph Stalin joined them. Roosevelt and other world leaders also began planning the United Nations, a new organization to maintain world peace. Roosevelt won election to a fourth term in 1944.

Death

On April 12, 1945, Roosevelt died while resting at his cottage in Warm Springs,

Georgia. Vice President Harry S. Truman became president. Within five months World War II ended.

► More to explore

Great Depression • New Deal • Truman, Harry S. • United Nations • United States • World War II

Roosevelt, Theodore

Theodore Roosevelt was the 26th president of the United States. He took office after the assassination of President William McKinley in 1901. Roosevelt made the United States a strong presence in international affairs.

Early Life

Theodore Roosevelt was born in New York City on October 27, 1858. He was the second of four children born into a



Theodore Roosevelt was the 26th president of the United States.

wealthy family. Sickly as a boy, he later developed a strong body through exercise. He enjoyed hunting and ranching.

Roosevelt graduated from Harvard College in 1880. After briefly studying law, he won a seat in the New York legislature as a Republican.

In 1880 Roosevelt married Alice Hathaway Lee, with whom he had a daughter. His wife died in 1884, and in 1886 he married Edith Kermit Carow. They had five children.

Military and Political Career

In 1897 President McKinley made Roosevelt assistant secretary of the Navy. During the Spanish-American War in 1898 Roosevelt organized a unit of volunteer fighters. Known as the Rough Riders, the unit fought successfully in Cuba.

Roosevelt was a national hero after the war. He became governor of New York in 1898. In 1900 he won election as vice president under President McKinley. On September 14, 1901, McKinley died after being shot by an assassin. Roosevelt became president. In 1904 he won election to a full term.

Presidency

Roosevelt worked for peaceful relations between businesses and workers—a program he called the Square Deal. He also worked to prevent big companies from putting smaller companies out of business. Groups of big companies were called trusts, so Roosevelt became known as a “trust-buster.” Roosevelt also



TIMELINE

Roosevelt is born in New York City.

October 27, 1858

Roosevelt becomes president after President William McKinley dies.

1901

Roosevelt and the Rough Riders fight in the Spanish-American War.

1898

Roosevelt pushes Congress to create the Forest Service.

1905

Roosevelt leaves office.

1909

Roosevelt runs for president with his new Progressive Party but loses.

1912

Roosevelt dies in New York.

January 6, 1919

asked Congress to pass acts against the sale of contaminated food and drugs.

In addition, Roosevelt wanted to protect the country's natural resources. He set aside lands as national forests, which then became off-limits to companies looking for lumber, minerals, or water. Congress created the Forest Service in 1905 to oversee the national forests.

In foreign affairs Roosevelt said his policy was to "speak softly and carry a big stick." He meant that the United States should deal fairly with other countries but also be ready to protect its interests. For example, in 1903 Roosevelt helped Panama gain independence from Colombia. In exchange, he demanded a piece of land. Afterward the United States began building the Panama Canal through that land.

Furthermore, Roosevelt expanded the Monroe Doctrine. In 1823 President

James Monroe had said that Europe should not become involved in the Americas. Roosevelt added that the United States would police the countries of Latin America to make sure they fulfilled their agreements with other countries.

Later Years

After leaving office in 1909, Roosevelt traveled to Africa and Europe. In 1912 he founded the Progressive Party and ran for president as its candidate. Both he and President William Howard Taft lost to the Democratic candidate, Woodrow Wilson. After that defeat Roosevelt wrote his autobiography and traveled to Brazil. Before Republicans could nominate him for president in 1920, Roosevelt died in New York on January 6, 1919.

► More to explore

McKinley, William • Panama Canal • Spanish-American War • Taft, William Howard • United States

Root

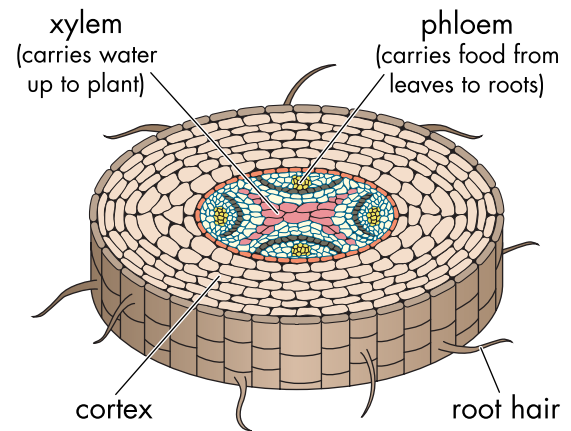
A root is a part of a plant that is usually hidden underground. Roots have several purposes. They hold the plant in the ground and keep it upright. They take water and food from the soil. They also store food for the plant.

There are two main kinds of roots: taproots and fibrous roots. A taproot is a long, thick root that points straight down. Smaller roots can grow out of its sides. Plants with taproots include carrots and dandelions. Fibrous roots are made up of many small roots, all about the same size. The small roots grow out in many directions from the base of the stem. Grasses have fibrous root systems.



Grass has fibrous roots. A sugar beet has a fleshy taproot.

Inside View of a Root



Each part of a root has a role in keeping the plant healthy.

A few plants can grow roots above-ground. Corn, for example, may grow roots out of its lower stem. Called aerial roots, they help to prop up the plant.

The end of a root is called the root tip. It makes new cells so that the root can grow. It has a cap that protects the root as it pushes through the soil. Above the root tip, on the outside of the root, root hairs take in water and nutrients. The water and nutrients move through a layer called the cortex on their way to the center of the root. The cortex also stores the plant's extra food. At the center of the root are tissues that carry water and food between the roots and the rest of the plant.

Damage to the roots will harm or kill a plant. If roots or root hairs are cut, the plant may not be able to get enough nutrients. Roots that dry out may never be able to absorb water again. If the soil is packed too tightly, roots cannot grow.

► More to explore

Carrot • Corn • Dandelion • Grass

Rose

Roses are flowers with a rich scent.

There are about 100 species, or types, of rose plant. They belong to the rose family of plants, called Rosaceae. Most roses grown in gardens and sold by florists are hybrid tea roses.

Roses grow almost all over the world. The plants grow in the form of shrubs or vines. The stems usually have sharp thorns.

The flowers vary in color and size. They come in shades of pink, red, orange, yellow, and white. They may be from 0.5 inch (1.3 centimeters) to 7 inches (18 centimeters) across. Wild roses usually have five petals. Roses grown by people often have many sets of petals. The petals grow out from a fleshy, fruit-like structure known as a hip.

Roses make beautiful decorations. But roses have other uses besides being pretty. People use the fragrant oil from rose blossoms in perfumes. They also use

rose hips to make jams and herbal teas. Rose hips are a rich source of vitamin C.

► More to explore

Flower • Plant

Roseau



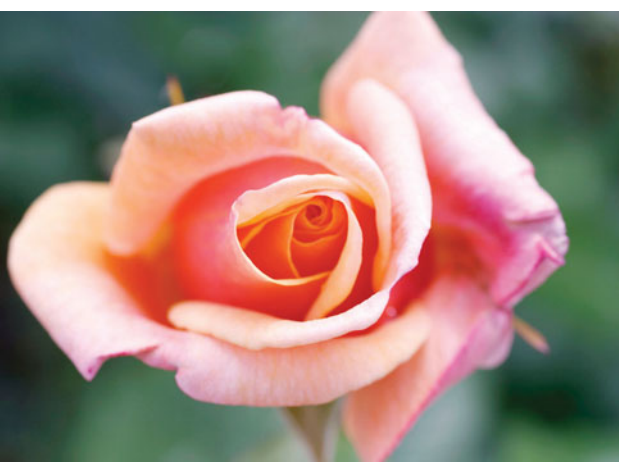
Population
(2006 estimate)
16,600

Roseau is the capital and largest town of Dominica, an island country in the Caribbean Sea. Roseau lies on the island's southwestern coast, near the Roseau River.

Roseau has an attractive waterfront with a harbor and a dock for cruise ships. Waterfalls and hot springs can be found in and around the town. Roseau also has a botanical garden and a cultural museum.

Dominica's economy is based on farming and tourism. Bananas, coconut oil, and soaps are exported from Roseau. Many of the town's people work in hotels or restaurants.

France and Great Britain fought for control of Dominica for hundreds of years. In 1805 French troops burned much of Roseau. In 1978 Dominica became an independent country with Roseau as its



Rose plants are grown in many gardens for their beautiful flowers.



The Roman Catholic cathedral is one of the main buildings of Roseau, Dominica.

capital. A hurricane struck a year later. It caused great damage.

► More to explore

Dominica

Rosh Hashana

Rosh Hashana is the start of the religious new year for followers of Judaism. To Jewish people, it also marks the anniversary of the creation of the world. Rosh Hashana means “beginning of the

year” in the Hebrew language. Festive gatherings with family and friends are a tradition during this holiday. Also traditional are meals that feature sweet foods. The holiday is celebrated during the first two days of the Hebrew calendar month of Tishri. The holiday falls either in September or in early October. Rosh Hashana begins a 10-day period called the High Holy Days, or the Days of Awe, that ends on Yom Kippur.

Rosh Hashana is a joyous holiday, but it also is a serious one. Work is not allowed on the holiday. Most of the day is spent praying in the synagogue, the Jewish house of worship. The service at the synagogue includes the sounding of the shofar, a trumpet made of a ram’s horn. During Rosh Hashana people take time to review the mistakes they made in the past year. They also plan the changes they hope to make in the new year.

► More to explore

Judaism • Yom Kippur



Jews pray and blow on the shofar (a type of horn) during Rosh Hashana in Jerusalem, Israel.

Ross, Betsy

Legend says that Betsy Ross sewed the first flag of the United States in 1776. The flag was known as the Stars and Stripes.

Elizabeth, or Betsy, Griscom was born on January 1, 1752, in Philadelphia, Pennsylvania. She attended a Quaker (a type of Christian) school. She married John Ross in 1773. The couple worked together in an upholstery business that he started. John died in 1776.



A painting shows Betsy Ross displaying the first U.S. flag to George Washington (left) and other patriots.

There is no solid proof that Betsy Ross sewed the first U.S. flag. But most people accept the following story as true. In 1776 a secret committee of three people, including George Washington, asked Ross to sew a flag. The flag was to have 13 stars and 13 stripes, to stand for the 13 American colonies. Ross suggested that the stars have five points instead of six, as Washington had chosen. She showed the men that it was easy to make a five-pointed star by folding a piece of cloth and making just one cut. Ross then made the flag at her house. Whether this story is true or false, in 1777 the United States accepted the Stars and Stripes as its new flag.

Ross married and then lost two more husbands. She continued with her upholstery business until she was 75. She died in Philadelphia on January 30, 1836.

► More to explore

American Revolution • United States
• Washington, George

Rowling, J.K.

British writer J.K. Rowling is the creator of the character Harry Potter. Her books and movies about the boy wizard are popular with children and adults throughout the world.

Joanne Rowling was born on July 31, 1965, in Chipping Sodbury, England. She first thought up Harry Potter in 1990 during a long train delay. But she had trouble producing a book about him. She was a busy single mother. She had to write by hand because she could not afford a typewriter or a computer.

In 1997 she finally published the first book about Harry Potter. It appeared in the United Kingdom as *Harry Potter and the Philosopher's Stone*. It was published in the United States in 1998 as *Harry*



Author J.K. Rowling signs one of her Harry Potter books.

Potter and the Sorcerer's Stone. Rowling did not want boys to know the author was a woman, so she used initials. (Rowling does not have a middle name, so she chose "K" in honor of her grandmother Kathleen.)

Other successful Harry Potter books followed. Movie versions of the books began coming to theaters in 2001.

► More to explore

Book and Bookmaking • Literature for Children

Rubella

Rubella is a disease that is also known as German measles or three-day measles. A germ known as a virus causes rubella. The rubella virus passes from person to person through coughing and sneezing. The virus that causes rubella is not the same virus that causes regular measles.

Rubella is not usually a serious disease. However, pregnant women with rubella may pass the virus to their unborn children. Infected children may be born



The red rash of rubella can be seen on a person's arm.

with deafness, heart defects, vision problems, or other disabilities.

A rubella infection begins with a fever. The throat and the glands at the back of the neck may be sore. After one or two days a rash begins on the face and spreads downward. The spots of the rash are either pink or light red. The spots may be so close together that they look like patches. The rash lasts about three days.

Rubella is usually a mild illness that does not require medical treatment. Patients with rubella should rest and take pain medication if a doctor recommends it.

Scientists developed a vaccine for rubella in 1969. (A vaccine is a substance that prevents people from getting a certain disease.) Rubella is now rare in the United States. Most children get a vaccination that protects them against rubella, measles, and mumps.

► More to explore

Measles • Mumps • Virus

Rudolph, Wilma

Wilma Rudolph was an outstanding athlete in track and field events. She was the first U.S. woman to win three gold medals in a single Olympics. People called her the world's fastest woman.

Wilma Glodean Rudolph was born on June 23, 1940, near Clarksville, Tennessee. As a child Wilma had many illnesses, including polio. This disease made her unable to walk without a leg

Rug and Carpet

Rugs and carpets are thick textiles, or pieces of cloth, that people use as floor coverings. They are often decorative as well as useful. The term rug usually means a floor covering that is not fastened down and does not cover the entire floor. Carpet usually means a floor covering that is fastened down and covers the entire floor.

Most rugs and carpets are made by weaving together two sets of yarn. One set stretches from top to bottom. The other set goes from side to side. The yarn is made of wool, nylon, or other fibers. Many rugs and carpets have a raised surface called pile. The pile may be made of loops of yarn. Or it may be made of strands of yarn that stick up from the carpet backing. Flat-woven rugs have intersecting strands of yarn but no pile.

Today many rugs and carpets are made on machines that can produce them quickly and inexpensively. But for thou-



Colorful rugs line the walls and floor of a tent in Kazakhstan.



Wilma Rudolph wins the women's 100-meter dash in the 1960 Olympics.

brace or a special shoe. By age 12, however, she could walk normally.

Rudolph became a graceful yet powerful sprinter. She won a bronze medal at the 1956 Olympics. She won her three gold medals at the 1960 Olympics. She set world records in the 100- and 200-meter dashes and in the 4 × 100-meter relay.

After these victories Rudolph's hometown of Clarksville planned a welcome-home parade for her. Rudolph, who was African American, refused to participate unless blacks and whites could attend the event together. This was the first time that both races had gathered together in Clarksville.

Rudolph retired from running in 1962. She later became a track coach and a national sports commentator. She died on November 12, 1994, in Brentwood, Tennessee.

► More to explore

Olympic Games • Track and Field

sands of years people have woven beautiful rugs and carpets by hand.

Some of the best-known and most expensive handmade floor coverings are called Oriental rugs. They are made in such Asian countries as Iran, Turkey, China, and Azerbaijan. Many Oriental rugs are made by Muslims, who kneel on rugs when they pray.

There are many different designs of Oriental rugs. Some rugs have simple, brightly colored patterns with stars, squares, and other shapes. Other rugs have more complicated designs showing people, animals, and flowers.

► More to explore

Fibers • Textile

Rugby

Rugby is a ball game that is played on a grassy field. Two teams try to move the ball down the field into the opponent's goal. Players score points by carrying the ball across the goal line or by kicking it

between goalposts. The team that scores more points wins.

Rugby was invented in England in the 1800s. Today it is played throughout the world. It is most popular in Great Britain, Australia, New Zealand, and South Africa.

Playing Field and Equipment

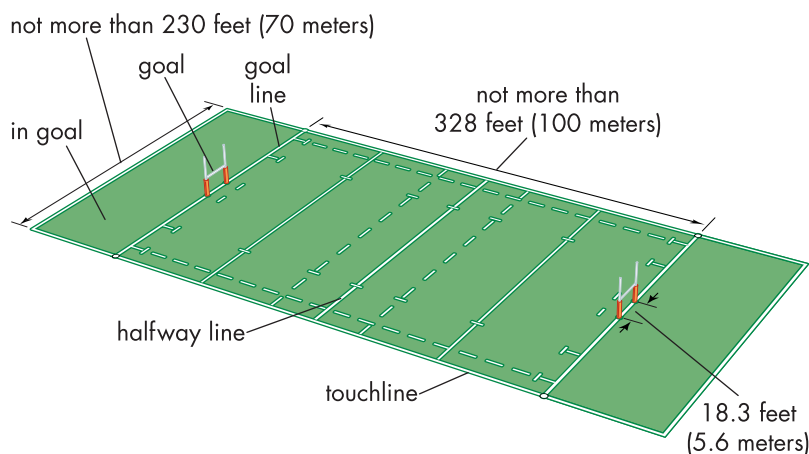
A rugby field is rectangular. Each end of the field has a goal line. Touchlines run along the sides of the field. Most of the game takes place between the goal lines and the touchlines. This playing area is no more than 230 feet (70 meters) wide and 328 feet (100 meters) long. Behind each goal line is an area called the “in goal.” At the center of each goal line stand two goalposts that are 18.3 feet (5.6 meters) apart. The goalposts are connected by a crossbar that is 10 feet (3 meters) above the ground. The goalposts and the crossbar form an H shape.

A rugby ball is oval and filled with air. It is about 11 inches (28 centimeters) long. Though rugby is a rough game, players usually do not wear helmets or pads. However, players do sometimes wear mouth guards. They also may protect their ears by taping them down.

Playing the Game

There are two versions of rugby. In one version, called Rugby Union, two 15-member teams compete. In the other version, called Rugby League, the teams have 13 members.

A rugby game usually has two 40-minute halves. There are no time-



The goal lines at each end and the touchlines along the sides outline the main playing area of a rugby field.

outs, and play rarely stops. The game starts with a kickoff—one team kicks the ball to the other team. The two teams then move up and down the field as they gain and lose control of the ball.

The players may catch the ball, throw it, or run with it. Teammates may pass the ball to each other either sideways or backwards. They may not pass the ball forward. Players may also kick the ball.

The two ways of scoring points in rugby are called tries and goals. A player scores a try by touching the ball to the ground behind the opponent's goal line. A player scores a goal by kicking the ball over the crossbar between the opponent's goalposts.

After a try, the scoring team can kick a type of goal called a conversion goal. During play, a player scores a dropped goal by dropping the ball and kicking it after it bounces. A team can score a penalty goal after the other team breaks the rules.

Rugby Union and Rugby League award different numbers of points for tries and goals. In both versions, however, a try is worth more points than a goal.

As in American football, the team defending its goal tries to tackle the opponent who is carrying the ball. One type of tackle forces the player to the ground. Another type happens when the player is stopped and held motionless.

The scrum, or scrummage, is a unique feature of rugby. It is a way to put the



Players in a scrum struggle for the ball.

ball in play. Six or eight players from each team link their arms and bend forward to form a tightly packed group. The ball is dropped between the two teams. The players use their feet to try to get control of the ball.

History

According to legend, rugby began at Rugby School in England in 1823. During a soccer game, a student named William Webb Ellis picked up the ball with his hands and ran with it. This went against the rules of soccer, which ban the use of the hands. But it led to the creation of rugby.

A group of English teams formed the Rugby Football Union (RFU) in 1871. The RFU wrote rules for the game. In 1895 more than 20 teams left the RFU. They set their own rules. The league they created is now known as the Rugby Football League. The different versions of the game came to be known as Rugby Union and Rugby League.

► More to explore

Football • Soccer • Sports

Did You Know?

The ancient game called harpastum is like rugby. Romans introduced it to Great Britain in about AD 400.



Russia

Russia has been a powerful country throughout its history. In the 1900s it was the center of the Union of Soviet Socialist Republics. Today Russia is the largest country in the world. The capital of Russia is Moscow.

Geography

Russia stretches from eastern Europe to the Pacific Ocean. On the west Russia borders the Baltic Sea, Norway, Finland, Estonia, Latvia, Belarus, and Ukraine. The small Russian province of Kaliningrad lies apart from the rest of Russia, between Lithuania and Poland. To the southwest of Russia are the Black and Caspian seas, Georgia, and Azerbaijan. South of Russia are Kazakhstan, Mongolia, China, and North Korea. The Arctic Ocean lies to the north. Several large islands in the Arctic and Pacific oceans also belong to Russia.

Russia lies partly in Europe and partly in Asia. The low Ural Mountains are the dividing line. European Russia is a broad plain with scattered hills. South of the plain are the Caucasus Mountains. Asian Russia contains the large region called Siberia. Siberia includes a plain and a plateau, or area of flat, raised land. Northeastern Russia has mountain chains and volcanoes.

The most important river in European Russia is the Volga. Many other rivers run through Siberia. In general, Russia has warm summers and very cold, snowy winters.

Plants and Animals

A treeless region called tundra lies along Russia's northern coast. Only mosses, lichens, and grasses grow in the tundra. South of the tundra is the taiga, an area



of evergreen forests. The taiga stretches across most of Siberia. In European Russia there are forests of ash, spruce, hazel, oak, and other trees. An area of grassland, called the steppe, covers southern Russia.

Animals in the tundra include reindeer, Arctic foxes, and musk oxen. The taiga is home to sables, squirrels, foxes, elk, and bears. Marmots, skunks, and wolves are common on the steppe.



Winter weather is severe in many parts of Russia.

People

About 80 percent of the people are Russians. The largest minority groups are the Tatars and the Ukrainians. Most of the population speaks Russian. Most people live in cities. Moscow is the largest city by far.

About one third of the people follow no religion. About half of the people are Eastern Orthodox Christians. There are smaller groups of Muslims, Protestants, and Jews.



Most of Russia's people live in cities. But small towns and farms can be found throughout the country.

Economy

Most Russian workers work in services, including banking, science and technology, education, and transportation. International trade is also a large part of the economy.

Russia's factories produce metals, machinery, cement, chemicals, motor vehicles, military equipment, and other goods. Russia is also a top producer of coal, oil, and natural gas. Its mines provide iron ore, copper, nickel, zinc, and other minerals. The large forests supply wood.

Farmers in Russia grow mainly grains, including wheat, barley, rye, and oats. Other crops include potatoes, sugar beets, corn, and sunflower seeds. Cattle, pigs, and sheep are the main livestock. Fishing is another important source of food.

History

People have lived in what is now Russia for thousands of years. The East Slavs

Facts About RUSSIA



Population
(2008 estimate)
141,841,000

Area
6,592,800 sq mi
(17,075,400 sq km)

Capital
Moscow

Form of government
Republic

Major cities
Moscow, Saint Petersburg, Novosibirsk, Nizhny Novgorod

settled in the southwest by the AD 300s. They came from eastern Europe.

By the 800s people from Scandinavia (Denmark, Sweden, and Norway) had entered the territory of the East Slavs. These Scandinavians are known as Varangians. The Varangians mixed with the Slavs and gave them the name Rus. The name Russia came from that name.

The town of Kiev was the capital of the territory, which became known as Kievan Rus. Kievan Rus grew to be the largest state in Europe.

The Mongols and Muscovy

In the 1200s warriors from central Asia known as Mongols, or Tatars, invaded Kievan Rus. The Mongols set up a kingdom called the Golden Horde. During the time of Mongol rule, two strong Russian states developed. Novgorod became a powerful state in western Russia. Muscovy, or Moscow, became the strongest power in the north.

In 1478 the ruler of Muscovy, Ivan III (also called Ivan the Great) conquered Novgorod. Two years later he defeated the Mongols and made the Russian lands independent. Ivan IV came to the throne in 1533. He called himself tsar (emperor) of all Russia. Ivan IV earned the title Ivan the Terrible because of his cruel and violent rule.

The Romanov Dynasty

In 1613 Michael Romanov became tsar. His family ruled Russia until 1917. Under the Romanovs, Russia became one of the most powerful states in Europe.

Peter I, called Peter the Great, became tsar in 1682. Peter added to Russia's territory and built a new capital, which he named Saint Petersburg. Catherine II, called Catherine the Great, came to the throne in 1762. She also expanded Russia. Nicholas II, who became tsar in 1894, was the last of the Romanov rulers.



TIMELINE

The Mongols invade Kievan Rus.

1200s

Michael Romanov becomes tsar of Russia.

1613

Russia becomes part of the Soviet Union.

1922

Yeltsin resigns as president; Vladimir Putin becomes the next president.

1999

Ivan III ends Mongol rule.

1480

The Russian Revolution overthrows the tsar.

1917

The U.S.S.R. collapses; Boris Yeltsin becomes president of an independent Russia.

1991



Catherine the Great ruled Russia from 1762 to 1796.

The Russian Revolution

In 1914 Russia entered World War I. After three years of terrible losses, the Russian people rebelled against the tsar in March 1917. Nicholas II stepped down, and the country set up a temporary government. Nicholas was later executed.

In November 1917 a group called the Bolsheviks seized control of Russia. Led by Vladimir Lenin, the Bolsheviks set up a Communist government. The new government took Russia out of World War I.

The Soviet Union

Some Russians fought a civil war against the Bolsheviks, but the Bolsheviks defeated them. In 1922 the Bolsheviks set up a new country called the Union of Soviet Socialist Republics, or the Soviet Union. Russia was the largest of the new

country's republics, or states. The Communist government of the Soviet Union ruled harshly at times. Millions of people died during the rule of Soviet leader Joseph Stalin.

By the 1980s many people in the Soviet Union wanted more freedom and a better economy. A leader named Mikhail Gorbachev tried to institute some reforms. But the Communist government could not solve the country's problems. In 1991 the Soviet Union collapsed. Each of the 15 republics that had made up the Soviet Union became an independent country.

A New Russia

The first leader of the newly independent Russia was Boris Yeltsin. His government gave the people more rights and freedoms. However, the government also faced a poor economy and a number of revolts. One of those revolts took place in the southwestern region called Chechnya. Some people in the region wanted independence from Russia. Chechen rebels carried out several deadly attacks in Russia.

Yeltsin retired in 1999. His successor continued to face problems with the economy and with the rebellion in Chechnya into the 21st century.

► More to explore

Communism • Ivan IV • Lenin, Vladimir Ilich • Moscow • Nicholas II • Peter the Great • Russian Revolution • Tsar • Union of Soviet Socialist Republics • Volga River

Russian Revolution

Centuries of harsh rule under the tsars, or emperors, of Russia came to an end with the Russian Revolution of 1917. The revolution took place in two stages. In the end, it gave the Russian people an entirely new form of government.

Background

The common people of Russia had few rights under the tsars. They protested this situation in 1905. Afterward, Tsar Nicholas II created a lawmaking body called the Duma. The Duma was supposed to give some of the citizens a say in the government. However, the tsar still held most of the power.

February Revolution

By 1917, Russia faced several challenges. The country was fighting Germany in World War I (1914–18). Russia was also short of food and fuel for the cold winter. In the capital city of Petrograd (now Saint Petersburg), angry people pro-

tested the hard conditions. The army joined the protesters instead of stopping them. Tsar Nicholas II had to give up all power. This was called the February Revolution.

A committee of the Duma appointed a temporary government to replace the tsar. This government was unable to solve Russia's problems. A group of workers and soldiers rose to challenge the government. The group was called the Petrograd Soviet.

Other soviets soon appeared in other cities. As the government grew weaker, the soviets grew stronger. Several different political parties fought for control of the soviets. Eventually, the party called the Bolsheviks came out on top. Vladimir Lenin led the Bolsheviks.

October Revolution

In October 1917 the Bolsheviks took over the government. Soon a new government was formed, with Lenin as its leader. The Bolsheviks believed in Communism. They thought that all the common working people should share in the wealth of the country. They did not believe that individuals should be able to own land on their own. They took away everything that the tsar's family had owned. They also improved conditions for workers.

Civil War

Lenin made peace with Germany in March 1918. In the process, he had to give up much of Russia's territory. This made many Russians unhappy. Some of them started a civil war.



Protesters gather outside the tsar's palace in Petrograd (now Saint Petersburg) in 1917.

The armies that fought the war were called the Reds and the Whites. The Reds represented the Russian Communists, as the Bolsheviks called themselves after March 1918. The Whites represented other groups that wanted to control the country. During the war the Communists killed the tsar and his family. The Communists won the war in November 1920. In 1922 they gave the country a new name—the Union of Soviet Socialist Republics.

► More to explore

Communism • Lenin, Vladimir Ilich • Nicholas II • Russia • Tsar • Union of Soviet Socialist Republics

Ruth, Babe

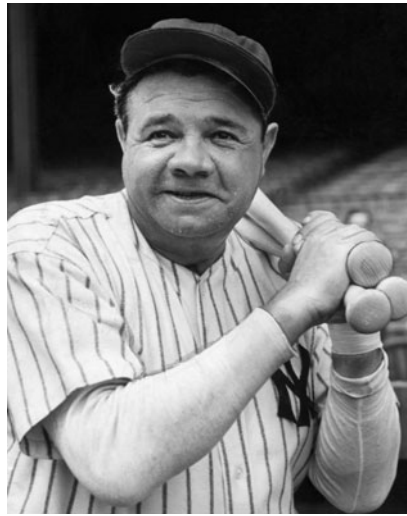
Babe Ruth is probably the most famous player in baseball history. He set or tied about 60 records during his long major league career.

Early Life

George Herman Ruth was born in Baltimore, in the U.S. state of Maryland, on February 6, 1895. He spent much of his childhood getting into trouble on the streets. At age 7 his parents placed him in Saint Mary's Industrial School, which took in troubled youth. There he learned to play baseball.

Career

Ruth began his career in 1914 as a pitcher for Baltimore's minor league team. It was then that he got the nickname Babe. Later in 1914 he joined the Boston Red Sox. Ruth pitched for Bos-



Babe Ruth

ton in the World Series in 1916 and 1918. He also became a powerful batter. In 1918 the team moved him to the outfield so he could play in every game.

In 1920 the Red Sox sold Ruth to the New York Yankees. Ruth played his best seasons with the Yankees. He led the American League in home runs for 12 years. In 1927 he hit 60 home runs. This was a season record that was not broken until 1961.

Ruth played 22 major league seasons and starred in 10 World Series. His lifetime record of 714 home runs stood until Hank Aaron broke it in 1974.

Retirement

Ruth played his last season for the Boston Braves in 1935. In 1936 he was elected to the Baseball Hall of Fame. Ruth died in New York City on August 16, 1948.

► More to explore

Aaron, Hank • Baseball

Did You Know?

Babe Ruth was known as the Sultan of Swat.



Rwanda

Rwanda is a small, mountainous country in east-central Africa. The capital is Kigali.

Rwanda borders the Democratic Republic of the Congo, Uganda, Tanzania, and Burundi. Lake Kivu forms part of Rwanda's western border. Mountains, hills, and deep valleys cover the land.

Rwanda has bamboo forests, wooded regions, and grasslands. Its wildlife includes elephants, chimpanzees, antelopes, zebras, hippopotamuses, and buffalo. Rare mountain gorillas live in Rwanda's Virunga Mountains.



Women carry baskets on their heads in Rwanda.

Most Rwandans are farmers who produce food for their own families. The major food crops are plantains, sweet potatoes, cassava, potatoes, sorghum, and corn. Cattle and goats are the main livestock. Rwandans also grow coffee and tea to sell to other countries.

The first people to live in Rwanda were the Twa. The Hutu arrived next. The Tutsi appeared in the 1300s and conquered the Hutu. Germany and then Belgium controlled Rwanda from the late 1800s. In 1962 Rwanda became independent under Hutu leaders.

Tutsi rebels began a civil war in 1990. In 1994 Hutu forces killed at least 500,000 people, mostly Tutsi. The Tutsi rebels managed to take control of Rwanda, however. They set up a government with both Tutsi and Hutu representatives.

► **More to explore**
Africa • Kigali

Facts About RWANDA



Population
(2008 estimate)
10,009,000

Area
10,169 sq mi
(26,338 sq km)

Capital
Kigali

Form of government
Republic

Major cities
Kigali, Gitarama,
Butare,
Ruhengeri,
Gisenyi



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Rye

Rye is a grain that grows well in poor soils and harsh climates. Grains are grasses that produce seeds that can be eaten. Poland, Russia, and Germany are major rye-producing countries. The scientific name for rye is *Secale cereale*.

A rye plant grows to about 4 to 6 feet (1 to 2 meters) tall. It has a round, hollow stem and long, narrow leaves. The leaves are blue-green and have a coarse texture. At the end of the stem is a slender structure called a spike, which holds the seeds. A rye spike is about 3 to 6 inches (7.6 to 15 centimeters) long. There are two or more rows of seeds on each spike.

People grind rye seeds to make flour. Rye flour is used to make bread and crackers. It is often mixed with wheat flour.



Rye grows in colder regions than most other grasses that are used for food.



Women in Albania cut and thresh, or remove the seeds from, rye plants.

Farmers feed rye to livestock. They also use rye plants to make tough straw. Rye straw is used as bedding for farm animals. It is used in mattresses, hats, and paper, too.

A poisonous fungus called ergot sometimes attacks rye plants. Ergot forms hard, black masses on rye plants that may look like grains. People or animals may become ill or even die after eating rye with ergot in it. Ergot poisoning can cause hallucinations (seeing things that are not there), vomiting, and shaking.

Many people throughout history have observed the effects of ergot on humans and animals. Some experts think that the people accused of being witches during the Salem witch trials of 1692 may have had ergot poisoning. Today, foods made with rye that are sold in stores rarely contain ergot. Scientists have even found a way to use chemicals in ergot to make certain medicines.

► More to explore

Grain • Grass • Salem Witch Trials
• Wheat

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Sacagawea was a member of the Shoshone Native American group.

(See Sacagawea.)

The scientific method is the process that scientists use to solve problems.

(See Science.)

The shamrock is a symbol of Ireland.

(See Shamrock.)

The Chinese began making silk more than 4,500 years ago.

(See Silk.)

Skateboarding first became popular in the early 1960s.

(See Skateboarding.)

Events at the Winter Olympics include the types of skiing called Nordic, Alpine, and freestyle.

(See Skiing.)

Sacagawea

Sacagawea was a member of the Shoshone Native American tribe. She helped Meriwether Lewis and William Clark explore parts of the western United States from 1804 to 1806. She traveled thousands of miles in the wilderness on the group's journey to the Pacific Ocean.

Early Life

Sacagawea was born in about 1786 in what is now Idaho or Montana. When Sacagawea was about 10 or 12 years old, a group of Hidatsa Native Americans captured her. They took her to what is now North Dakota. In about 1804 Sacagawea became the wife of a French Canadian fur trapper named Toussaint Charbonneau.

Expedition

In 1803 President Thomas Jefferson organized an expedition to explore the territory between the Missouri River and the Pacific Ocean. Meriwether Lewis and William Clark headed the expedition. They arrived near what is now Bismarck, North Dakota, in the fall of 1804. They spent the winter among the Mandan tribe of Native Americans.

During this time Lewis and Clark hired Charbonneau as a guide. Sacagawea joined the expedition as well. On February 11, 1805, Sacagawea gave birth to a baby boy, Jean-Baptiste. When the expedition set out on April 7, Sacagawea carried her infant son on her back.



Sacagawea guided Lewis and Clark on their expedition of 1804–06.

Sacagawea identified plants for the explorers. She also searched for fruits and vegetables that they could eat. In addition, her presence showed other Native Americans that the group came in peace. Many tribes believed that a woman with an infant would travel only with a peaceful group.

In August 1805 the expedition met some Shoshone in what is now Montana. The chief of these Shoshone was Sacagawea's brother, Cameahwait. He gave the expedition horses and guides to help them on their journey.

Charbonneau and Sacagawea went all the way to the Pacific coast with the expedition. Sacagawea may have died several years after the return journey, in 1812. But some stories say that she rejoined the Shoshone in Wyoming and lived until 1884.

► More to explore

Lewis and Clark Expedition • Shoshone

Did You Know?

The U.S. golden dollar coin, introduced in 2000, features an image of Sacagawea carrying her infant son on her back.

Sacramento



Sacramento is the capital of the U.S. state of California. The city was the center of activity during a gold rush in the mid-1800s. It lies where the American and Sacramento rivers meet. A shipping canal links Sacramento to the San Francisco Bay.

Many people in Sacramento work for the government or in health care, trade, or other service industries. Food processing, construction, and printing are among the leading industries.

In 1839 a man named John Augustus Sutter established a settlement that later

became Sacramento. In 1848 gold was discovered on Sutter's land. Thousands of people moved to the area to look for gold. Sutter's son soon laid out Sacramento. The city became the supply center for the gold seekers.

In 1854 Sacramento became the capital of California. Gold mining later declined in the area. But Sacramento continued to grow as a center of government, food processing, and shipping.

► More to explore

California • Gold Rush

Sadat, Anwar el-

Anwar el-Sadat was the president of Egypt from 1970 until 1981. He is remembered for trying to make peace with Israel.

Muhammad Anwar el-Sadat was born in Egypt on December 25, 1918. He graduated from the Cairo Military Academy in 1938. In 1950 Sadat joined a group of military officers led by Gamal Abdel Nasser. In 1952 Nasser's group removed the king of Egypt from power. Nasser became president. In 1964 Sadat became vice president under Nasser. He was elected president soon after Nasser's death in 1970.

As president Sadat had to deal with Egypt's long-standing conflict with Israel. Many Arabs in Egypt and other countries believed that Israel was their enemy. Some thought that Israel should not even be a country. In 1967 Israel had taken control of a piece of Egyptian



The California state Capitol is in a park in the heart of Sacramento.



Anwar el-Sadat

land called the Sinai Peninsula. In October 1973 Sadat led Egypt into war with Israeli soldiers on the peninsula. Israel was able to hold onto the land. But Sadat gained respect among Arabs.

Sadat's actions toward Israel soon changed. In 1977 he made a historic visit to the country. He said that Israel had a right to exist and offered to make peace. Later he took part in peace talks with Menachem Begin, Israel's leader. Sadat and Begin shared the Nobel peace prize in 1978. The next year Egypt and Israel signed a peace treaty. It was the first peace treaty between Israel and an Arab country.

Many Arabs hated Sadat for making peace with Israel. They still believed that Israel was their enemy. A group of Egyptian soldiers shot and killed Sadat in Cairo on October 6, 1981.

► **More to explore**
Arab-Israeli Wars • Egypt

Saddam Hussein

Saddam Hussein took power as president of Iraq in 1979. He ruled as a brutal dictator, or leader with unlimited power, until 2003.

Early Life

Saddam Hussein al-Tikriti was born on April 28, 1937, in a village near Tikrit in northern Iraq. He joined the Ba'th Party, a revolutionary political group, in 1957. Two years later, Saddam participated in a plot to kill Iraq's prime minister (head of government). When the government discovered the plot, he fled to Egypt.

Presidency

Saddam returned to Iraq in 1963. He joined the Ba'th government, which had seized power. The Ba'th government lost control later that year. But the Ba'th Party, including Saddam, returned to power in 1968. In 1979 Saddam forced



A special court was created for Saddam Hussein's trial. He was accused of several crimes, including crimes against humanity.

Iraq's president to retire. He then took the job for himself.

As president, Saddam became extremely rich and built a powerful military to serve him. Those who did not agree with Saddam's government paid a heavy price. They were often jailed or murdered.

Despite these acts, many Arabs in the Middle East admired Saddam. They liked that he spoke out against the power of the United States and Europe.

In 1980 Saddam attacked Iran. This led to the Iran-Iraq War, which lasted until 1988. In 1990 Saddam invaded Kuwait. The Persian Gulf War began in 1991 as a result. During the war, the United States and its allies drove Saddam's forces out of Kuwait.

Capture and Trial

By 2003 the United States and other countries feared that Saddam was building illegal weapons and supporting terrorism. U.S. and British forces invaded Iraq that year, but Saddam escaped. Months later, U.S. soldiers found and captured him. In 2005 Saddam went on trial for his crimes. He was accused of playing a role in the deaths of more than 100 people in Iraq in the 1980s. In 2006 he was found guilty and sentenced to death. He was executed on December 30, 2006.

► More to explore

Iran-Iraq War • Iraq • Persian Gulf War



Special seats and seat belts help keep children safe while riding in cars.

Safety

Safety is anything that people do to protect themselves or others from harmful accidents. People can prevent accidents by following safety measures. Governments pass laws to keep people safe. For example, a law could require that buildings have clearly marked exits. This would allow people to escape quickly during a fire. Laws and other rules that are meant to protect all people are called public safety measures.

Another way to promote public safety is to spread information about safety measures. For example, magazines about parenting often have articles on how to keep a house safe for children. These articles may recommend keeping cleaning products out of reach or covering electrical outlets.

Workplaces also have rules that are designed to keep workers safe. These are called occupational safety measures. For example, factories may require employ-

ees to wear a helmet or safety goggles to protect themselves from injury.

► More to explore

Law

Sahara



The Sahara is the largest desert on Earth. It covers about 3,320,000 square miles (8,600,000 square kilometers) in northern Africa. The Sahara includes at least part of 10 countries—Morocco, Algeria, Tunisia, Libya, Egypt, Mauritania, Mali, Niger, Chad, and Sudan—plus the territory of Western Sahara.

The Sahara is the hottest region in the world during the day in summer. Temperatures above 120° F (49° C) are common. The air becomes much cooler when the sun sets. Rain is very rare. When rain does fall, it often comes in powerful storms.

Features

Much of the Sahara's surface is rocky. There are flat plains and raised land

called plateaus. There are also some mountains. Sand covers only about one quarter of the Sahara. In some places the sand is piled high in hills called dunes.

The Nile and the Niger rivers cross the edges of the Sahara. No other streams flow year-round. Dry streambeds, called wadis, fill with water only when it rains.

In some places there is a supply of underground water. These places are called oases. The water comes to the surface through openings called springs. People also dig wells to get underground water.

Plants and Animals

Many of the Sahara's plants and animals depend on the water found at oases. Shrubs, rough grasses, and palm trees make up much of the region's plant life. Olive, cypress, and acacia trees grow in the highlands. Animals of the desert include gerbils, hedgehogs, gazelles, baboons, hyenas, and foxes. Scorpions and snakes are common.



Palm trees grow in an oasis of the Sahara in the country of Algeria.

People

Some people of the Sahara are nomads. They raise camels, sheep, and goats. They roam from place to place in search of grass for their animals to eat. Today, however, most of the people of the Sahara stay in one place, mostly near oases. They grow fruit, especially dates, and grains such as millet, barley, and wheat. People trade animal skins, wool, fruits, and salt in oasis villages.

► More to explore

Africa • Desert • Nomad

Saint

A saint is a person who is believed to be especially close to God. Some saints are prophets, or messengers of God. Others are healers, doers of good deeds, or martyrs. A martyr is someone who is killed for belonging to a religion. Sainthood is an official status in some religions. In other religions people become saints simply because many people honor them.

Saints are venerated—honored with special acts of devotion—in two of the three branches of Christianity. In Roman Catholicism and Eastern Orthodoxy a person can be declared a saint after his or her death. Roman Catholics and Eastern Orthodox Christians believe that saints have special powers to help people. They venerate the remains of the saints and certain objects associated with the saints. They also honor each saint with a special feast day. Most Protestants do not venerate saints.



Stained-glass windows in many Roman Catholic churches have images of saints, such as Saint Dominic.

Muhammad, the great prophet of Islam, said that there are no saints. But Muslims do honor certain holy people who they believe are especially close to God. These holy people are thought to have special powers to bless people and to perform miracles. Such a person is known as *wali*, meaning “friend of God.” Muslims also honor martyrs.

All Buddhists honor saints, which include the Buddha himself. Buddhists believe in a cycle of birth, death, and rebirth; after death, one’s soul is reborn in another being. In general, Buddhists honor as saints people who have freed themselves from this cycle of rebirth and those who have helped others free themselves from the cycle.

Hinduism recognizes a great variety of saints, including sadhus and avatars. Sadhus are holy people who go without

nearly everything except what they need to survive, such as a little food and a few simple belongings. An avatar is believed to be a god reborn into human or animal form.

► More to explore

Buddhism • Christianity • Eastern Orthodox Churches • Hinduism • Islam • Martyr • Roman Catholicism

Saint Augustine

Saint Augustine is a city in northeastern Florida, near the Atlantic Ocean. Settled in 1565, it is the oldest city in the United States. It was named for the Catholic leader Saint Augustine of Hippo.

Saint Augustine has kept many historical features. Many buildings still look like they did when Spain ruled Florida as a colony hundreds of years ago. The Spanish fortress Castillo de San Marcos is a national monument. It is the oldest fort in the country.



A photograph taken from above shows the Castillo de San Marcos. The Spanish built the stone fort in Saint Augustine, Florida, between 1672 and 1695.

Saint Augustine's main industry is tourism. Many people hold jobs in hotels and other places serving vacationers. The city also depends on fishing and shipbuilding.

In 1513 the Spanish explorer Juan Ponce de León landed near what is now Saint Augustine. He claimed the land for Spain. Another Spanish explorer, Pedro Menéndez de Avilés, founded Saint Augustine in 1565. In 1819 Spain gave Florida to the United States.

► More to explore

Florida • Ponce de León, Juan

Saint George's



Population
(2004 estimate), town, 4,300; (2001 estimate), urban area, 35,560

Saint George's is the capital of Grenada, an island country in the eastern part of the Caribbean Sea. It lies on the island's southwestern coast. It surrounds a deep, scenic harbor called the Carenage.

Saint George's is Grenada's main port and center of trade. Shipping goods through the port is important to the town's economy. Tourism also brings money to the town. The sites include two forts from the 1700s and the Grenada National Museum. Saint



A sailing ship finds shelter in the harbor of Saint George's, Grenada.

George's also has a university that specializes in medical education.

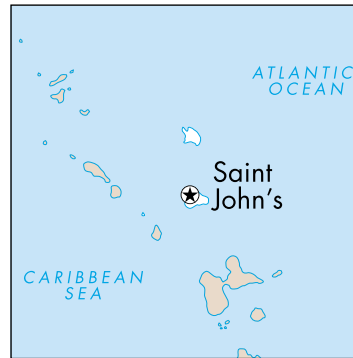
French settlers founded Saint George's in 1650. Great Britain took over Grenada in the late 1700s. From 1885 to 1958 Saint George's was the capital of the British Windward Islands, a group of islands that were a British colony. In 1974 Grenada became an independent country. Saint George's was its capital.

Fighting took place in Saint George's when U.S. troops invaded Grenada in 1983. Hurricanes caused great damage to the town in 2004 and 2005.

► More to explore

Grenada

Saint John's



Population
(2004 estimate)
23,600

Saint John's is the capital of Antigua and Barbuda, an island country in the Caribbean Sea. The city lies on the coast of the island of Antigua. It is the country's largest city, main port, and business center. It is also a popular vacation spot.

The main landmark in Saint John's is Saint John's Cathedral. First built in 1681, it was rebuilt in the 1840s after suffering earthquake damage. Other attractions include Fort James, from the 1700s, and the Museum of Antigua and Barbuda.

Tourism is the main industry in Saint John's. Banking and shipping goods through the port also bring money to the city.

British settlers founded Saint John's as a colony in 1632. The city had to be rebuilt after severe earthquakes occurred in 1690 and 1843. A fire in 1769 and a hurricane in 1847 also damaged the city. In 1981 Antigua and Barbuda became an independent country with Saint John's as its capital.

► More to explore

Antigua and Barbuda



Saint Kitts and Nevis

Saint Kitts and Nevis is a country of two small islands in the eastern Caribbean Sea. The capital and largest city is Basseterre.

Geography

Saint Kitts, sometimes called Saint Christopher, is about twice the size of Nevis. Nevis lies to the southeast of Saint Kitts. The islands are part of the region called the West Indies.

An inactive volcano rises on Saint Kitts. A mountain forms almost all of Nevis' land. Saint Kitts has beaches of black sand, while Nevis' sand is white. Both islands have hot, tropical weather.

People

Most of the country's people have black African ancestors. There are also small groups of Asians and whites. Most of the population is Christian. English is the main language. Most people live in the countryside.

Economy

The economy depends on tourism, banking, and the sale of sugar. The sugar is made from sugarcane, which grows all over Saint Kitts. Farmers on Nevis grow mostly cotton, vegetables, and coconuts. Manufacturers on the islands make electronics, beverages, and clothing.

History

The first people on the islands were American Indians. Christopher Columbus visited the islands in 1493. The English settled on both islands in the early 1600s. They brought in Africans to work as slaves on sugar plantations.

The English and the French fought over the islands until the 1780s. Then the English officially took control. In 1882 Great Britain combined Saint Kitts, Nevis, and the island of Anguilla into one colony. Anguilla broke away in 1971. Saint Kitts and Nevis became an independent country in 1983. In 1998 Nevis voted against separating from Saint Kitts.

► More to explore

Basseterre • West Indies

Facts About SAINT KITTs AND NEVIS



Population
(2008 estimate)
51,300

Area
104 sq mi (269 sq km)

Capital
Basseterre

Form of government
Constitutional monarchy

Major cities
Basseterre,
Charlestown

Plants and Animals

Grasslands and rain forests grow on the islands' mountains. Animals include green vervet monkeys, wild deer, and mongooses. Spiny lobsters, parrot fish, and hammerhead sharks live in the waters around the islands.



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Saint Lawrence River and Seaway



The Saint Lawrence Seaway connects the Great Lakes to the Atlantic Ocean in eastern North America. The Saint Lawrence River is just one part of the long seaway system. The seaway allows ships from the ocean to reach the industrial and farming regions around the Great Lakes. This makes the system very important to the economies of both the United States and Canada.

The Saint Lawrence Seaway is about 2,340 miles (3,770 kilometers) long. At its western end is the city of Duluth, Minnesota. Duluth is a port on Lake Superior, one of the five Great Lakes. Narrow waterways link the lakes to one another. The Saint Lawrence River itself begins at the eastern end of Lake Ontario. It flows 740 miles (1,190 kilometers) to the Gulf of Saint Lawrence. Finally, the Cabot Strait connects the gulf to the Atlantic Ocean.

French explorer Jacques Cartier was the first European to sail into the Saint Lawrence River. He could not travel

very far into the continent by river, however. The way was blocked by a stretch of rapids. Later explorers discovered other natural barriers to sailing through the Great Lakes.

Over the years people built canals, locks, and dams to get around some of these barriers. Canals are waterways built to connect two natural bodies of water. Locks are structures that raise or lower a ship from one water level to another. They are needed where the water level varies between different bodies of water.

Some barriers remained, however. Finally in 1954 the governments of the United States and Canada agreed to build the Saint Lawrence Seaway. The construction took nearly five years. In addition to building locks and canals, workers deepened several waterways. The seaway opened to ships in 1959.

► More to explore

Atlantic Ocean • Canal • Dam • Great Lakes • Sault Sainte Marie Canals



A passenger ship winds through the Thousand Islands section of the Saint Lawrence River near the river's source at Lake Ontario.



Saint Lucia

Saint Lucia is a small island country in the West Indies region of the Caribbean Sea. Castries is the capital.

Geography

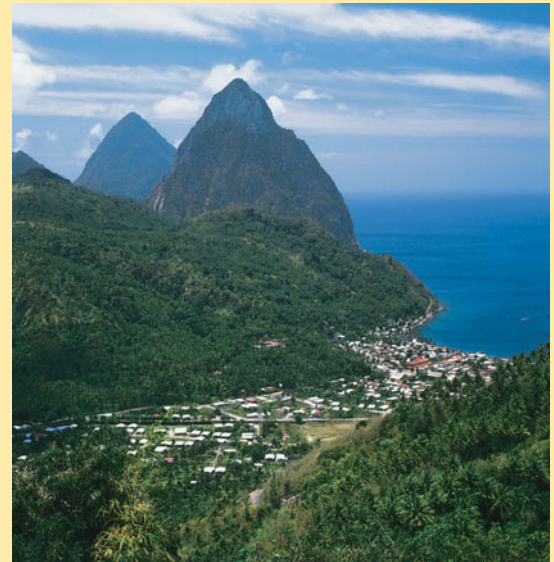
Mountains run from north to south through the middle of the island. Many streams flow down into deep valleys. In the southwest is the volcano Qualibou, which lets off steam and gases. Saint Lucia's climate is hot and humid.

Plants and Animals

Rain forests grow on the highest land. Flowering vines, wild orchids, and ferns grow in the valleys. The country's colorful birds include parrots, black finches, and orioles.

People

Most Saint Lucians are descended from black Africans. Many people have mixed African and European roots. The island also has small groups of East Indians and whites. Most people speak English or a



The town of Soufrière, Saint Lucia, occupies a valley near two huge mounds of rock. A volcano formed the mounds long ago.

local version of French. Christianity is the main religion.

Economy

The economy is based mainly on tourism and agriculture. Farmers grow bananas, mangoes, coconuts, yams, citrus fruits, and some cacao. Saint Lucia also produces clothing and electronics.

History

Carib Indians lived on the island when Europeans arrived in about 1500. France and Great Britain fought for control of the island until 1814, when Britain won. The Europeans brought Africans with them to work as slaves on cotton and sugar plantations. Saint Lucia gained independence in 1979.

► More to explore

Castries • West Indies

Facts About SAINT LUCIA



Population
(2008 estimate)
171,000

Area
238 sq mi (617 sq km)

Capital
Castries

Form of government
Constitutional monarchy

Major towns
Castries, Vieux Fort, Micoud, Soufrière



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Saint Patrick's Day

Saint Patrick's Day is a popular holiday celebrated on March 17. The holiday honors Saint Patrick, the man who brought Christianity to Ireland. Saint Patrick's Day is a national holiday in Ireland. Yet people in other countries enjoy the holiday, too.



Irish Americans march in New York City's Saint Patrick's Day parade.

How Saint Patrick's Day Is Celebrated

Many people celebrate Saint Patrick's Day by wearing green clothing or shamrocks (three-leafed clovers). Green and shamrocks are symbols of Ireland.

Many U.S. cities with large Irish populations have huge public celebrations. Boston held its first Saint Patrick's Day celebration in 1737. In the 1760s New York City began the tradition of holding

a parade for the occasion. Chicago dyes its river green for the day.

History

Saint Patrick was born in Britain in the late 300s or early 400s. Pirates captured him when he was 16. They sold him as a slave in Ireland, where he worked as a shepherd for six years. He then escaped and returned home.

After years of religious training, Patrick went back to Ireland. There he converted many people to Christianity. The year of his death is unknown.

There are several legends about Saint Patrick. One legend says that he drove away all the snakes in Ireland. Another legend says that he used the three parts of a shamrock leaf to explain the idea of the Trinity. The Trinity refers to the Father, Son, and Holy Spirit in the Christian religion.

► More to explore

Ireland • Shamrock

Saint Paul



Population
(2000 census),
city, 287,151;
(2007 estimate)
277,251

Saint Paul is the capital of the U.S. state of Minnesota. It lies along a deep bend of the Mississippi River. The city of



The Cathedral of Saint Paul is the most important Roman Catholic church in Saint Paul, Minnesota.

Minneapolis is located just across the river. Together Saint Paul and Minneapolis are called the Twin Cities.

Saint Paul is a major center of industry, banking, and insurance. Factories in and around the city make cars, electronics, computers, and many other products. Other factories process oil and foods.

Hundreds of years ago the Dakota Indians (a division of the Sioux people) were living in the Saint Paul region. A French-Canadian trader named Pierre Parrant established a settlement there in 1838. The settlement was called Pig's Eye, which was Parrant's nickname. A log chapel dedicated to the Christian saint Paul was built in Pig's Eye in 1838. After that the town was called Saint Paul.

In 1849 Saint Paul became the capital of the Minnesota Territory. In 1858 Minnesota became a U.S. state with Saint Paul as its capital.

► More to explore

Minnesota

Saint Petersburg



Population
(2006 estimate)
4,580,620

Saint Petersburg is the second largest city in Russia, after Moscow. The city lies on the Neva River where it flows into the Baltic Sea. It spreads over a mainland section and more than 40 islands. Saint Petersburg was Russia's capital for 200 years. Today it is an important center of industry, education, science, and culture.

Places of Interest

Saint Petersburg is famous for its beauty and its many historic buildings. The huge gold dome of Saint Isaac's Cathedral can be seen from throughout the city. Many of Russia's former rulers, called tsars, are buried in the Cathedral of Saints Peter and Paul. The city's Winter Palace was home to the tsars from 1762 until 1917.

Saint Petersburg is a great cultural center known for its ballet, music, and theater. The city's Hermitage and State Russian museums have large, important collections of art.

Economy

Saint Petersburg is a major seaport and industrial center. Factories in the city make such products as machinery, metals, foods and drinks, and paper. Many people in the city work in services such as trade, education, and health care.

History

The Russian tsar Peter the Great founded Saint Petersburg in 1703. The city grew rapidly. It became the capital of Russia in 1712.

By the late 1800s Saint Petersburg had many factories, as well as many poor workers. In 1905 government troops shot people who were protesting poor working conditions. This event became known as Bloody Sunday. It led people to try to overthrow Russia's government. In 1917 the city was a center of the revolution that forced the tsar from power.

The leader of that revolution was named Lenin. For much of the 1900s Saint Petersburg was called Leningrad in his honor.

In 1918 the Russian capital was moved to Moscow. Russia soon became part of a Communist country called the Soviet Union.

German soldiers surrounded Leningrad from 1941 until 1944, during World War II. More than half a million people in the city died from bombings, hunger, and disease. Leningrad was later rebuilt.

In 1991 the Soviet Union fell apart, and Russia became a separate country again. Leningrad's name was changed back to Saint Petersburg.

► More to explore

Lenin, Vladimir Ilich • Moscow • Peter the Great • Russia • Russian Revolution • Union of Soviet Socialist Republics



Buildings line the banks of a waterway in Saint Petersburg, Russia. Many waterways flow through the city.



Saint Vincent and the Grenadines

Saint Vincent and the Grenadines is an island country in the Caribbean Sea. It is part of the region called the West Indies. The capital is Kingstown.

Geography

The country is made up of more than 30 islands. Saint Vincent is the largest island. To the south the small Grenadine Islands stretch toward the country of Grenada.

Saint Vincent is mountainous. The highest point is an active volcano called Mount Soufrière. The Grenadines have coral reefs. The country has a warm climate with dry and rainy seasons.

Plants and Animals

Rain forests grow on the mountains of Saint Vincent. Palm and fruit trees grow in lower areas. Mammals include

opossums and large rodents called agoutis.

People

About two thirds of the population is black. Many other people have a mixture of African and European or Carib Indian ancestors. There are small groups of Asians and whites. English is the main language. Most people are Christians. Most of the population lives in towns along the coast of Saint Vincent.

Economy

The country's economy depends on tourism, banking, and agriculture. Crops include bananas, coconuts, and root vegetables.

History

The Ciboney, Arawak, and Carib Indians were the first people on the islands. In the 1600s shipwrecked African slaves landed on Saint Vincent and mixed with the Carib. The British won control of the islands in the 1700s. British settlers brought in more Africans to work as slaves on sugarcane plantations. Saint Vincent and the Grenadines became an independent country in 1979.

► More to explore

Carib • Kingstown • West Indies

Facts About SAINT VINCENT AND THE GRENADINES



Population
(2008 estimate)
106,000

Area
150 sq mi (389 sq km)

Capital
Kingstown

Form of government
Constitutional monarchy

Major city
Kingstown



Salamander

A salamander is an amphibian with a slender body and a long tail. They are related to frogs and toads. Salamanders look rather like lizards. But unlike lizards, they are covered with smooth, shiny skin. There are about 400 species, or kinds, of salamander. They include newts and mud puppies.

Salamanders live mainly in the northern half of the world. Like other amphibians, they can live either in water or on land. Salamanders especially like dark, wet places, like the woods.

Most salamanders are about 4 to 6 inches (10 to 15 centimeters) long. They have four short legs. They are usually brightly colored, often with spots or stripes. Salamanders can breathe through lungs or through special organs called gills. Some salamanders can take in oxygen through their skin.

Salamanders usually hide during the day and come out at night. They eat insects, small fish, worms, snails, and smaller salamanders. Salamanders have several ways to protect themselves from enemies. Most kinds can release a poison that tastes bad or causes pain. A salamander can also lash its tail to defend itself. If the tail breaks off, a salamander can grow a new one.

Salamanders hatch from eggs. Most salamanders begin life in water in a form called larvae. Larvae go through a series of changes, called metamorphosis,



A salamander often has bright colors or patterns on its body.

to become adults. Salamanders that hatch on land come out as miniature adults.

► More to explore

Amphibian • Metamorphosis

Salem



Population
(2000 census),
city, 136,924;
(2007 estimate)
151,913

Salem is the capital of the U.S. state of Oregon. It lies on the Willamette River in an area with many farms. Dairy farming and fruit growing are common.

Many people in Salem work for the government or in health care, trade, or other service industries. Factories in the city process the foods grown on nearby farms. Other factories in Salem make metal products, electronics, and other goods.



A statue of a pioneer stands on top of the unusual dome of the Oregon state Capitol in Salem, Oregon.

The Kalapuya Indians lived in the Salem area for thousands of years. In the 1800s a preacher named Jason Lee came to the area to try to convert the Indians to the Methodist religion. Lee led a group of Methodists who settled Salem in 1840.

Salem developed quickly. Many pioneers who traveled to the area on a major route called the Oregon Trail settled in Salem. In 1851 Salem became the capital of the Oregon Territory. In 1859 Oregon became a U.S. state with Salem as its capital.

► More to explore

Oregon • Oregon Trail

Salem Witch Trials

In 1692 many people in Salem, Massachusetts, came to believe that there were witches among them. As fear gripped

the town, they put their fellow townspeople on trial for witchcraft. The Salem witch trials caused 19 people to be put to death.

In 1692 Massachusetts was one of Great Britain's North American colonies. It had been settled by strict Christians called Puritans. The witchcraft scare probably began when a slave named Tituba told a group of girls stories about African witchcraft. A few of the girls then claimed to be possessed by the devil. They accused Tituba and two other women of witchcraft. Colonial officials believed the girls and arrested the women. Tituba confessed to being a witch.

The town panicked. Between May and September townspeople accused hundreds of men and women of witchcraft. The colony set up a special court to try



An illustration shows a trial of two women accused of witchcraft in Salem, Massachusetts, in 1692.

them. Under pressure, many of the people on trial falsely accused others. About 150 people were put in prison. Nineteen people were found guilty and hanged.

By October the panic was over. The governor of Massachusetts stopped the trials and released the prisoners. The government later reversed the guilty decisions.

► More to explore

Massachusetts Bay Colony • Puritans

Salish

► see Flathead.

Salk, Jonas

Jonas Salk was a pioneer in the field of medical research. His research focused on creating vaccines, or substances that protect people from diseases. He is best known for making the first safe and successful vaccine to prevent polio.

Polio is a disease caused by a tiny germ called a virus. The virus can damage the nerves in the spine. Some people with this damage lose their ability to walk. U.S. president Franklin D. Roosevelt had polio. He used a wheelchair for the rest of his life. Others lose their ability to breathe on their own, which can cause death.

Jonas Edward Salk was born in New York City on October 28, 1914. His parents were immigrants from Russia.



Dr. Jonas Salk vaccinates a girl against polio in 1953.

After graduating from high school at only 15 years old, Salk entered the City College of New York. He went on to medical school at New York University and became a doctor in 1939.

Salk began studying vaccines in 1942. By the 1950s he had developed a vaccine against polio. He tested the polio vaccine on large numbers of people, including himself and his own family. The vaccine worked. In 1955 the U.S. government agreed that Salk's vaccine was safe. Millions of children soon received the vaccine. Salk's success made him a hero. He received the Presidential Medal of Freedom and other awards.

Salk died in La Jolla, California, on June 23, 1995. Today polio has been nearly wiped out in the United States and

many other countries. However, it still occurs in places where children have not received the vaccine.

► More to explore

Polio • Vaccine

Salmon



Salmon make difficult journeys, including leaping up waterfalls, to reach the place where they mate and produce offspring.

Salmon are fish that are known for making long, difficult journeys in order to breed. Salmon belong to the scientific family Salmonidae, which also includes trout.

There is one species, or type, of Atlantic salmon. There are six species of Pacific salmon: coho, chum, king, pink, sock-eye, and cherry.

Where Salmon Live

The Atlantic salmon lives mainly in the North Atlantic Ocean. It breeds in the

rivers of North America and Europe. Pacific salmon are found in the waters of the North Pacific. They breed in rivers near both the North American and Asian coasts.

Physical Features

Salmon come in a range of sizes. The Atlantic salmon weighs about 12 pounds (5.5 kilograms). The pink salmon usually weighs 3 to 6 pounds (1.4 to 2.7 kilograms). The king salmon may weigh 25 pounds (11 kilograms) or more.

While in the ocean, salmon have a silver color and spots on their back and fins. During the breeding season, they undergo changes in color that vary by species.

Life Cycle

After being born in freshwater, salmon travel to the ocean. They live there for one to three years. Then they travel back to where they hatched in order to breed. For some salmon, this can mean a trip of more than 2,000 miles (3,200 kilometers). Salmon may leap over waterfalls and cut through churning rapids to reach their home waters again.

Once in freshwater, salmon stop eating and live off their body fat. The males fight for a mate. After a male and a female are paired, the female digs a pit and lays thousands of eggs. Most Pacific salmon die shortly after mating. Many Atlantic salmon, however, return to the sea and may breed again.

► More to explore

Fish • Trout

Salt Lake City



Population
(2000 census),
city, 181,743;
(2007 estimate)
180,651

Salt Lake City is the capital of the U.S. state of Utah. It is the world headquarters of the Church of Jesus Christ of Latter-day Saints, or the Mormons. The church strongly influences the city's political, social, and economic life.

Salt Lake City lies in a valley at the foot of the Wasatch Range of the Rocky Mountains. Several ski areas are located nearby. Salt Lake City hosted the 2002 Winter Olympics.

Many people in Salt Lake City work for the government or in health care, trade, tourism, or other service industries. Factories in the city make computers, software, and other high-technology products.

Mormon pioneers founded Salt Lake City. In 1847 a church leader named Brigham Young led a group of Mormons westward from Illinois. They were looking for a place where they would be free to practice their religion. They settled in a valley near the Great Salt Lake. The Mormons turned the bare land into a beautiful, well-planned city.

In 1856 Salt Lake City became the capital of the Utah Territory. Utah became a U.S. state in 1896. Salt Lake City was the state capital.

► More to explore

Mormon • Rocky Mountains • Utah



A view of Salt Lake City, Utah, includes the state Capitol (left) and the Wasatch Range.



Samoa

Samoa is a small island country in the southern Pacific Ocean. Samoa's capital and largest town is Apia, on the northern coast of Upolu Island.

Samoa is in Polynesia, which is part of the region called Oceania. There are two main islands, Upolu and Savai'i, and seven smaller islands. Six islands east of Samoa are controlled by the United States. They are called American Samoa.

The islands of Samoa are rocky and mountainous. They are surrounded by coral reefs. The weather is hot and humid all year.

Rain forests cover much of Samoa. The wildlife includes bats, lizards, snakes, scorpions, centipedes, and many birds.

Polynesians make up almost all of the country's people. These people and their language are called Samoan. Many people also speak English. Christianity is the main religion.



A village in Samoa has both traditional and modern buildings.

Tourism, fishing, and farming are important parts of Samoa's economy. Farmers grow coconuts, bananas, pineapples, mangoes, and taro.

Polynesians settled in Samoa in about 1000 BC. Europeans first arrived in the 1700s. In 1899 the United States and Germany divided the islands between themselves. The United States took the eastern islands (now American Samoa). Germany took the western islands, which were called Western Samoa.

New Zealand ruled Western Samoa from 1920 to 1961. The country became independent on January 1, 1962, and changed its name to Samoa in 1997.

► More to explore

Apia • Oceania

Facts About SAMOA

Population
(2008 estimate)
180,000

Area
1,093 sq mi
(2,831 sq km)

Capital
Apia

Form of government
Constitutional monarchy

Major towns
Apia, Vaitele, Faleasi'u



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Samurai

For hundreds of years warriors called samurai controlled Japan. The Japanese emperor took away the power of the samurai in 1871. But even after that, many Japanese people continued to honor the samurai for their fighting spirit.

Rise of the Samurai

The first samurai protected vast lands owned by members of Japan's upper class. Gradually the samurai spread out across the country and got their own pieces of land. They also built up their own armies. The samurai became more and more powerful.

In 1185 one of the samurai gained military control of all Japan. In 1192 this person took the title of shogun. The samurai then became the ruling class of



A photograph from the 1860s shows a samurai in armor.

Japan. Shoguns ruled Japan until 1867. Japan also had emperors during this time, but the emperors had less power than the shoguns.

Bushido

The samurai followed a set of rules called Bushido. The word Bushido means “way of the warrior.” A samurai built up his body and learned all the skills of a soldier. He was brave and honest. He honored his parents. But above all, he obeyed his leader. A samurai who lost a battle, or whose leader was killed, would often kill himself because he felt he had not done his duty.

End of the Samurai

Japan was mostly at peace between the 1600s and the 1800s. During this period most samurai worked for the government instead of fighting. But they were still called samurai because the rank was handed down from father to son.

By the mid-1860s many samurai were unhappy with the conditions in the country. They thought that the country needed to be more modern so they took part in a revolution that brought down the shogun.

An emperor named Meiji took power during the revolution. The samurai wanted Meiji to make Japan stronger. He did, but he also took away the power of the samurai. He created a modern army to replace them.

► More to explore

Japan • Meiji

Did You Know?

The samurai's method of killing himself was called seppuku, or hara-kiri, meaning “belly cutting.”

Sanaa



Population
(2007 estimate)
2,006,620

Sanaa is the capital of Yemen, a country in the Middle East. It is Yemen's largest city. It is also one of the oldest cities in the world. The city has thousands of stone houses built more than 1,000 years ago. Parts of the Great Mosque in Sanaa date back to the time of Muhammad, the founder of Islam.

Many people in Sanaa work for the government or in trade. Factories in the city make cotton cloth, food products, and other goods.

Sanaa is more than 2,000 years old. The city's people converted to Islam in 632. After that Muslim leaders ruled the city.



Rugged mountains tower behind the ancient city of Sanaa, Yemen.

Sanaa was part of the Turkish Ottoman Empire from the 1500s to the early 1900s.

For most of the 1900s Yemen was divided into two parts. In 1918 North Yemen became an independent country with Sanaa as its capital. In 1990 North Yemen and South Yemen united to form one country. Sanaa then became the capital of all of Yemen.

► More to explore

Yemen

Sand

Sand is made up of small, loose pieces of rock, soil, minerals, and even gemstones. It may also contain the remains of living things. Sand particles, called grains, are smaller than gravel. They are larger than particles of mud or clay.

Sand grains can be described by their size, color, and shape as well as the way they feel to the touch. Some grains are hard, while others are softer. Some are jagged or rough. Others are smooth and polished. Sand particles may be flat, oval, or round in shape.

How Sand Forms

Nature forms sand constantly. Tiny chips of rock are always breaking off from boulders, cliffs, and mountainsides. As the weather and water wear down the chips, they create sand. This is the most common kind of sand.

A second type of sand comes from living things, such as corals and clams. After



Building sand castles is a popular beach activity.

the animal dies, the ocean slowly wears down its skeleton or shell into tiny particles. This type of sand is common on tropical beaches.

A third type of sand comes from minerals dissolved in water. When the water dries up, it leaves behind the minerals in the form of sandlike crystals.

Where Sand Is Found

Sand is found in many places all over the world. It collects at beaches and in lakes and rivers. It lies at the bottom of oceans. In some deserts and on some beaches, the wind blows sand into large hills called dunes. Sometimes sand gathers at the openings of deep canyons. Schools and parks often provide sandboxes for children to play in.

Because sand grains are so small and light, they travel more easily than most other kinds of rock. Wind, water, and ice can carry sand far away from the place where it first formed.

► More to explore

Mineral • Rock • Sand Dune • Soil

Sand Dune

A hill or ridge of sand piled up by the wind is called a sand dune. Dunes may form wherever there is a lot of loose sand and enough wind to move it. Beaches and deserts are common places for dunes.

Most windblown sand is made up of the mineral quartz. However, near volcanoes, dunes may be built of volcanic ash particles. In some very dry regions, particles of the mineral gypsum can form gypsum dunes.

Dunes are always changing. The wind shifts the sand into a variety of shapes and heights. As wind containing sand comes to the peak of a dune's slope, the speed of the wind drops. The wind then releases the sand it was holding. The sand falls down the dune's steeper side. As this action keeps happening, the dune moves in the direction that the wind blows.

► More to explore

Desert • Sand



Death Valley National Park in California has sand dunes.

San José



Population
(2006
estimate), city,
344,750;
(2003
estimate), urban
area,
1,085,000

San José is the capital of Costa Rica, a country in Central America. It is the largest city in Costa Rica by far.

The economy of San José is very important to Costa Rica. Many people in the city work in government or business offices, schools, hospitals, hotels, and shops. Factories in San José make food and tobacco products, cloth, chemicals, software, and electronics.

American Indians have lived in the San José region for many thousands of years. In the 1500s Spain took control of what is now Costa Rica. Spanish settlers founded a town called Villa



A park in the center of San José, Costa Rica, has a bandstand that is sometimes used by musical groups.

Nueva in 1736. It was later renamed San José.

Costa Rica became free from Spanish rule in 1823. San José was made the capital. San José grew rapidly in the second half of the 20th century.

► More to explore

Costa Rica

San Juan



The city of San Juan is protected by walls that are more than 200 years old.

San Juan is the capital of the Commonwealth of Puerto Rico. Puerto Rico is an island in the West Indies that belongs to the United States. San Juan is the largest city in Puerto Rico.

San Juan is the oldest city in U.S. lands. The Spanish explorer Juan Ponce de León founded the city in 1508. The city grew into an important port and trade center. The United States took control in 1898. Tourism, government, shipping, and printing became important parts of the city's economy.

► More to explore

Ponce de León, Juan • Puerto Rico

San Marino

San Marino is one of the smallest countries in the world. It is surrounded by the country of Italy. Its capital is also called San Marino.

Geography

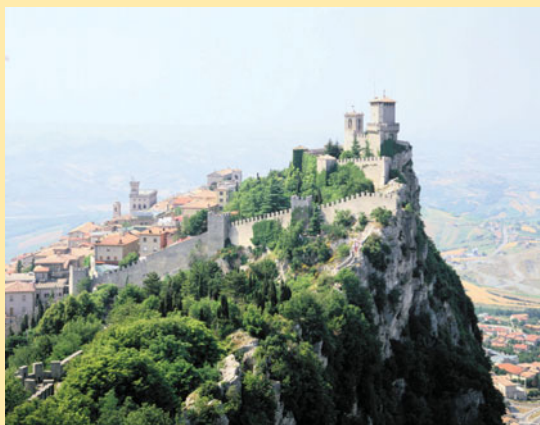
San Marino lies in the Apennine Mountains in central Italy. Mount Titano rises in the center of the country. Hills cover the southwest. A grassy plain slopes down in the northeast. San Marino has cold winters and warm summers.

Plants and Animals

Olive, pine, oak, ash, and other trees grow in San Marino. The country's animals include moles, hedgehogs, foxes, badgers, weasels, and hares.

People

The people of San Marino are similar in culture and background to their Italian neighbors. Italian is the main language. Most of the people are Roman Catholics.



Mount Titano is the highest point in San Marino. It is 2,424 feet (739 meters) tall.

Economy

Banking and tourism are very important to San Marino's economy. More than 3 million people visit San Marino each year. San Marino also sells postage stamps to collectors.

History

Stories say that a Christian named Marinus founded San Marino in the early AD 300s. He and his followers wanted freedom to practice the Christian religion. The people of San Marino built mountain forts that protected the country against invaders. This allowed San Marino to remain independent.

A group of representatives called the Great and General Council governs San Marino today. San Marino does not belong to the European Union (EU), but it uses the EU's form of money, the euro.

► More to explore

Italy



Facts About SAN MARINO



Population
(2008 estimate)
31,000

Area
24 sq mi (61 sq km)

Capital
San Marino

Form of government
Republic

Major cities
Serravalle/
Dogano, San
Marino, Borgo
Maggiore,
Murata,
Domagnano

San Salvador



Population
(2007 census),
city, 316,090;
urban area,
1,433,000

San Salvador is the capital of El Salvador, a country in Central America. It is the largest city in El Salvador by far. Over the years it has suffered many natural disasters, including earthquakes, floods, and hurricanes.

San Salvador is El Salvador's center of manufacturing, transportation, and services such as banking and trade. However, in the late 20th century a civil war in El Salvador hurt the city's economy greatly.



Shops line a street in San Salvador, the capital of El Salvador.

A Spanish explorer founded San Salvador in 1525. Spain ruled El Salvador as a colony from the early 1500s until 1823. El Salvador then joined the United Provinces of Central America. This was a union of former Spanish colonies. For a few years San Salvador was the capital of the United Provinces. In 1839 El Salvador became an independent country with San Salvador as its capital.

From 1979 to 1992 San Salvador was the site of terrible violence. The government of El Salvador fought rebels and had many thousands of other citizens killed. After the war the city worked to recover.

► More to explore

El Salvador

Santa Claus

Santa Claus is a legendary figure who is said to bring Christmas gifts to children. In Great Britain he is also known as Father Christmas. According to the story, Santa Claus lives at the North Pole with his wife, Mrs. Claus, and many elves. Throughout the year Santa and his elves make toys for Christmas. But they also keep track of which children have been good and which have been bad. On Christmas Eve Santa delivers toys to each good child's house.

Santa Claus is based on Saint Nicholas. Nicholas was a real person who lived in the AD 300s. People loved him because of his many acts of kindness. Through stories, Nicholas became known as a gift giver. In some European countries chil-



The first pictures of Santa Claus in his familiar red suit were drawn by Thomas Nast in the 1800s.

Children received gifts on his feast day, which was in December. Other countries had similar traditions of children receiving presents around Christmas. Europeans brought these traditions with them when they settled the American Colonies. The Dutch in particular are said to have brought the story of Saint Nicholas. The name Santa Claus came from the Dutch word for Saint Nicholas, Sinterklaas.

The image of Santa that people know today developed in the 1800s. In 1822 Clement C. Moore wrote a poem called *A Visit from Saint Nicholas*. This poem is better known as *'Twas the Night Before Christmas*. It describes a chubby, jolly, rosy-cheeked old man with a white beard. He flies through the air in his sleigh pulled by eight reindeer. He climbs down chimneys and leaves gifts

for children. In 1863 a U.S. cartoonist named Thomas Nast began drawing pictures of Santa Claus based on Moore's poem. Nast gave Santa his red suit with white fur trim.

► More to explore

Christmas

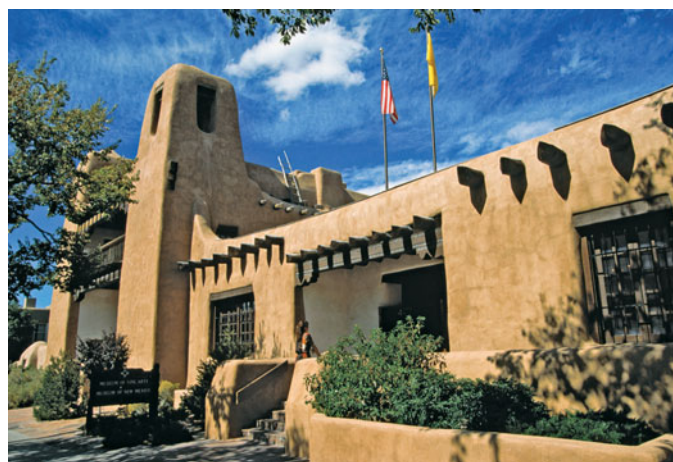
Santa Fe



Population

(2000 census),
city, 62,203;
(2007 estimate)
73,199

Santa Fe is the capital of the U.S. state of New Mexico. The city lies at the foot of the Sangre de Cristo Mountains. It is one of the oldest cities in North America. It is also a major center of the arts and of Hispanic and Native American culture.



The Santa Fe Museum of Fine Arts is an example of a traditional building style in New Mexico.

Tourism and other service industries are important to Santa Fe's economy. Many people in the city work for the government.

The Spanish founded Santa Fe in 1610 as the capital of their colony of New Mexico. Native Americans drove the Spanish out in 1680, but the Spanish returned in 1692.

The city became part of the newly independent country of Mexico in 1821. In that year a trade route called the Santa Fe Trail was opened between Santa Fe and Independence, Missouri.

In 1848, after the Mexican War, New Mexico became part of the United States. Santa Fe became the capital of the Territory of New Mexico in 1851.

In 1912 New Mexico became a U.S. state with Santa Fe as its capital.

► More to explore

Mexican War • New Mexico • Santa Fe Trail

Santa Fe Trail

In the 1800s the Santa Fe Trail was one of the longest and most important trade routes in the United States. Like the Oregon Trail (another famous route), the Santa Fe Trail began in Independence, Missouri. It stretched for about 900 miles (1,450 kilometers) across the Western plains to Santa Fe, New Mexico.

From Independence, the Santa Fe Trail went west into Kansas. It followed the Kansas River and then the Arkansas



The Santa Fe Trail divided in two in western Kansas. The southern route, called the Cimarron Cutoff, was shorter but more dangerous.

River into the western part of the state. There it divided into two main routes. The longer route looped slightly northwest into Colorado before coming down into Santa Fe. The other route came directly southwest. It was more popular because it was shorter. But it was also more dangerous because it passed through desert lands that had little water.

People traveled along the trail in covered wagons. Many wagons traveled together in lines, called wagon trains, for safety. If Native Americans attacked, the wagons could form a circle, and the travelers could defend themselves from the center. It took about six to eight weeks to make the trip.

Native Americans had used parts of the trail for hundreds of years. In 1821 and 1822 a trader named William Becknell led the first trading journeys on the trail. For 60 years afterward traders used the trail to ship goods to Santa Fe. People in the West sent silver and furs back to the East. Many settlers also used the trail to move to New Mexico, Colorado, and other parts of the West. In 1880 a rail-

road reached Santa Fe, and people stopped using the trail.

► More to explore

Oregon Trail • Santa Fe

Santiago



Population
(2007
estimate), urban
area,
5,700,000

Santiago is the capital of Chile, a country in South America. It is Chile's largest metropolitan area. It is also the country's center of culture, business, and industry. Santiago lies on the Mapocho River at the foot of the Andes Mountains. The river was made into a canal through the city. The city has had many earthquakes.



Santiago, Chile, sits west of the Andes Mountains.

Many of Chile's factories are in Santiago and its suburbs. The factories make metal products, processed foods, cloth, clothing, leather goods, and chemicals. Santiago is Chile's banking center. Other service industries such as tourism and insurance also bring money to the city.

Picunche Indians lived in the Santiago area before the Spanish arrived. Spanish settlers took over the area in the 1500s. The Spanish conqueror Pedro de Valdivia founded Santiago in 1541. The city grew slowly. Spain ruled Santiago until the early 1800s.

In 1818 Chile became an independent country with Santiago as its capital. After that the city's population and economy grew greatly.

► **More to explore**
Chile

Santo Domingo



Population
(2007 estimate), urban area, 2,200,000

Santo Domingo is the capital of the Dominican Republic, an island country in the Caribbean Sea. The city lies where the Ozama River flows into the sea. It is the Dominican Republic's largest city



The Roman Catholic cathedral in Santo Domingo, Dominican Republic, was the first cathedral built in the Americas.

and main port. It is also the oldest permanent city that Europeans established in the Americas.

Many people in Santo Domingo work for the government or in tourism and other service industries. The city is the Dominican Republic's center of banking, trade, and industry. Factories in the city make chemicals, metal products, food products, clothing, and plastics.

The explorer Bartholomew Columbus—the brother of Christopher Columbus—founded Santo Domingo in 1496. He made the city the capital of the first Spanish colony in the Americas.

France controlled Santo Domingo from 1795 to 1809. Then Spain and later Haiti took control of the city. In 1844 the Dominican Republic became an independent country. Santo Domingo was its capital.

► **More to explore**
Dominican Republic

São Paulo



Population

(2007 estimate), city, 10,238,500; urban area, 19,226,426

São Paulo is the largest city in Brazil, a country in South America. The city and its suburbs together make up one of the largest metropolitan areas in the world. The city's name means "Saint Paul" in Portuguese.

Many banks and large businesses have their headquarters in the São Paulo area. Trade, communications, and other service industries also bring money to the city. São Paulo has long been a major manufacturing center. Factories in the metropolitan area make clothing, cars, computers, chemicals, electrical products, and processed foods.

Roman Catholic priests from Portugal established São Paulo in 1554. They lived there with Indians whom they converted to Christianity. In the 1600s the Portuguese used the town as a base for their travels in search of treasure and of Indians to capture and enslave.

It was in São Paulo that Brazil declared itself free from Portuguese rule in 1822. The city grew throughout the 1800s. In the 1900s many new cloth mills and other factories were built. The new industries drew many more people to

the city. By 2000 São Paulo was the largest metropolitan area in the southern half of the world.

► More to explore

Brazil

São Tomé



Population

(2001 census), city, 3,666; urban area, 49,957

São Tomé is the capital of São Tomé and Príncipe, a small island country off the west coast of Africa. The city is located on the coast of São Tomé island. It is the country's largest city by far. It is also the main port. Shipping cocoa and other goods through the port brings money to São Tomé city.

Portuguese traders founded São Tomé city in about 1493. The Portuguese kept slaves from West Africa in the city until they could be shipped to the Americas. French pirates and later rebelling slaves burned the city in the late 1500s.

In 1975 São Tomé and Príncipe became an independent country. The city of São Tomé was its capital.

► More to explore

São Tomé and Príncipe

Did You Know?

One of São Tomé's most impressive old buildings is the fort of São Sebastião. It houses a national museum.



São Tomé and Príncipe

São Tomé and Príncipe is a small island country off the west coast of Africa. São Tomé is the capital and largest city.

São Tomé and Príncipe lies on the equator in the Gulf of Guinea, a part of the Atlantic Ocean. The country's closest neighbors are Gabon and Equatorial Guinea, on the coast of Africa.

The country includes two main islands: São Tomé and Príncipe. Both islands have lowlands in the northeast and high mountains in the south and west.

Rain forests cover nearly half of the land. Many rare birds and reptiles, including sea turtles, live in the country.

The islands' population is a mixture of peoples descended from three main groups: Portuguese settlers, Africans brought to the islands to work as slaves, and workers from Angola, Cape Verde, and Mozambique. Portuguese is the



Buildings from colonial times still stand in the capital of São Tomé and Príncipe.

national language. Most people are Roman Catholics.

São Tomé and Príncipe's economy depends on agriculture and fishing. Cocoa is the most important farm product. Other crops include coconuts, coffee, cinnamon, bananas, and vegetables. The country also produces palm oil, clothing, and wood. In the early 21st century São Tomé and Príncipe hoped to start making money from petroleum (oil) that was discovered in the Gulf of Guinea.

No one lived on the islands until Portuguese settlers arrived in the late 1400s. The Portuguese soon claimed the islands as a colony. São Tomé and Príncipe gained independence from Portugal in 1975. The country held its first free elections in 1991.

► **More to explore**
Africa • São Tomé

Facts About SÃO TOMÉ AND PRÍNCIPE



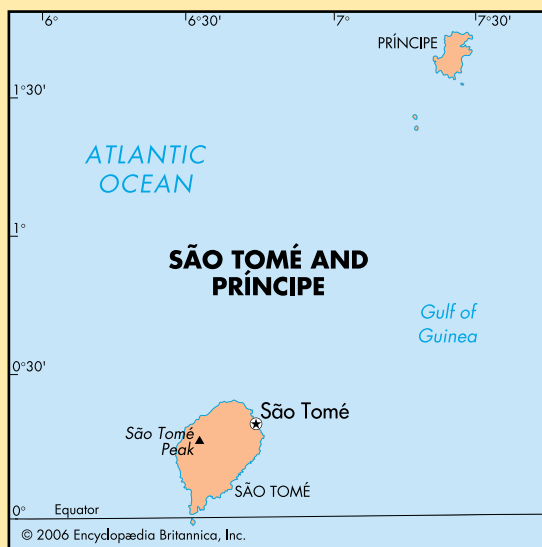
Population
(2008 estimate)
160,000

Area
386 sq mi (1,001
sq km)

Capital
São Tomé

**Form of
government**
Republic

Major cities
São Tomé, Neves,
Santana,
Trindade, Santo
António



Sarajevo



Population
(2005
estimate), city,
380,000;
(2004
estimate), urban
area, 602,500

Sarajevo is the capital of Bosnia and Herzegovina, a country in southeastern Europe. It is the country's largest city and cultural center.

Sarajevo is one of Bosnia and Herzegovina's centers of industry and banking. However, a civil war in the 1990s hurt the city's economy. In the early 21st century many city residents did not have jobs.

People have lived in the Sarajevo area for many thousands of years. Sarajevo became part of the Turkish Ottoman Empire in the 1400s. The Turks made the city a center of Muslim culture.

In 1878 Austria-Hungary took over Sarajevo. In the early 1900s Bosnia and Herzegovina became part of the new country of Yugoslavia.

In 1992 Bosnia and Herzegovina tried to break away from Yugoslavia. A civil war broke out between the Serb, Croat, and Bosniac (Muslim) ethnic groups. Thousands of people in Sarajevo were killed. Much of the city was destroyed.

The war ended in 1995. Bosnia and Herzegovina became an independent country with Sarajevo as its capital. By the early 21st century much of the city had been rebuilt.

► More to explore

Bosnia and Herzegovina • Yugoslavia

Sarcee

The Sarcee are Native Americans of Canada. Their name is sometimes spelled Sarsi. The Sarcee call themselves Tsuu T'ina. They live near the city of Calgary, Alberta. They may once have been part of the Beaver people, who lived to the north.

The Sarcee were Plains Indians. Like other Plains tribes, they hunted bison (buffalo) on horseback on the Great Plains. The Sarcee ate bison meat. They used bison hides to make tepees and clothing. They also gathered wild plants for food.

White traders arrived in Sarcee lands in the late 1700s. By that time the Sarcee lived in what are now southern Alberta



Mountains near Sarajevo, Bosnia and Herzegovina, were the setting for some of the events of the 1984 Winter Olympics.



A Sarccee man wears metal armbands and a headaddress.

and northern Montana. The traders brought guns to the tribes of the area. Then the Sarccee started fighting more often with other tribes. The greatest enemies of the Sarccee were the Cree and the Assiniboin. The Sarccee became allies of the powerful Blackfoot tribe for protection.

Many Sarccee died in war and from diseases brought by the white settlers. There were outbreaks of smallpox in 1836 and 1870, and scarlet fever struck in 1856. In 1877 the weakened Sarccee gave up their lands to the Canadian government. Three years later the Sarccee settled on a reservation near Calgary. At the end of the 20th century there were about 1,000 Sarccee living in Canada.

► More to explore

Blackfoot • Native Americans

SARS

SARS, or severe acute respiratory syndrome, is an illness that is similar to influenza, or the flu. In 2003 SARS became an epidemic. An epidemic is an outbreak of a disease that quickly infects a large number of people.

A germ called a virus causes SARS. The symptoms, or signs, of SARS are fever, headache, body aches, and a cough. People with SARS can pass the virus to others by sneezing or coughing.

SARS first appeared in Asia in 2002. By the end of May 2003, SARS had spread to North America, South America, and Europe. More than 8,000 cases of SARS were reported. About 800 people died from the disease. By June 2003 the spread of SARS had been controlled so that it was no longer an epidemic.

► More to explore

Disease, Human • Epidemic • Influenza



Students in a class in Hong Kong wear masks to protect them against the disease known as SARS. The masks keep them from breathing in the germ that causes SARS.

Saskatchewan

Saskatchewan is one of Canada's three Prairie Provinces. It is known for its vast fields of wheat and its valuable minerals. The name Saskatchewan was first used for the province's most important river. It comes from a Cree Indian word meaning "fast-flowing river." The capital of Saskatchewan is Regina.

Geography

Saskatchewan is bordered by Manitoba on the east and Alberta on the west. Manitoba and Alberta are the other two Prairie Provinces. To the north are the Northwest Territories, and to the south are the U.S. states of Montana and North Dakota.



Most of southern Saskatchewan is prairie—flat, treeless plains with some low hills. Wheat fields and cattle ranches cover huge stretches of land. North of the prairie is a rocky region with patches of forest and many lakes. Farther north, the forests get thicker. The extreme north of the province, however, is treeless tundra. Throughout the province winters are long and cold.

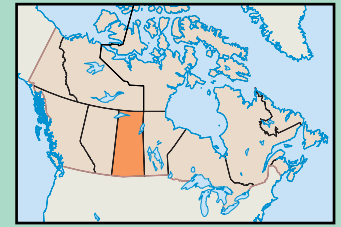
People

Most of Saskatchewan's people have European ancestors. People of German origin are the most numerous, followed by people with English, Scottish, Irish, Ukrainian, or French heritage. Residents with American Indian roots make up another large group. The Cree, the Assiniboin, and the Chipewyan are among the major Indian groups.

Nearly two thirds of Saskatchewan's people live in cities or towns. Even so, the province's largest cities are not particularly large. Saskatoon, the largest, has only about 225,000 people in the city and suburbs combined. Regina is slightly smaller. The University of Saskatchewan is in Saskatoon.

Economy

Saskatchewan's economy has always depended on products of the land. The province is a world leader in the production of wheat, and it also grows great amounts of barley, canola, oats, flax, and rye. Ranchers raise cattle and pigs.





Fields of wheat are a common sight in Saskatchewan.

Saskatchewan ranks among Canada's leading provinces in oil, coal, and natural gas production. Its mineral resources also include potash, which is used to make fertilizer, and uranium. Much of the industry in the province is tied to agriculture and mining—for example, meatpacking, flour milling, oil refining, and the production of farm equipment.

Although farming and mining are still very important in Saskatchewan, fewer workers make a living in these activities today than in the past. Many more people now work in the cities, providing services such as sales, government, and health care.

History

American Indians have lived in what is now Saskatchewan for more than 5,000 years. The first Europeans arrived late in the 1600s. They were fur trappers and traders. They worked for the Hudson's Bay Company, an English corporation that controlled a large part of what is now Canada for about 200 years.

In 1869 the newly formed government of Canada bought the Hudson's Bay Company's land, including the Saskatchewan area. In the early 1880s a railroad reached Regina from the east. Farmers soon moved in. The Indians and the Métis (people of mixed Indian and European descent) who lived in the area feared that the newcomers would take their land. In 1885 they rebelled against the Canadian government, which had encouraged the settlers. The rebellion failed, and in the years that followed many more settlers arrived to farm on the prairie. In 1905 the Canadian government created the province of Saskatchewan.

The population of the province grew rapidly in the first decades of the 1900s. In the mid-1900s Saskatchewan's government introduced many new programs. It was the first government in North America to pay for medical care for all its people.

► More to explore

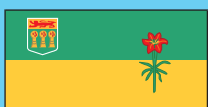
Assiniboin • Canada • Chipewyan
• Cree • Fur Trade • Hudson's Bay Company



The building housing Saskatchewan's legislative assembly stands among colorful flowers in Regina, the capital of Saskatchewan.

Facts About SASKATCHEWAN

Flag



Population
(2006 census)
968,157

Area
251,367 sq mi
(651,036 sq km)

Capital
Regina

Motto
*Multis E Gentibus,
Vires* (From Many
Peoples, Strength)

**When Saskatchewan
Became a
Province**
1905

Satellite

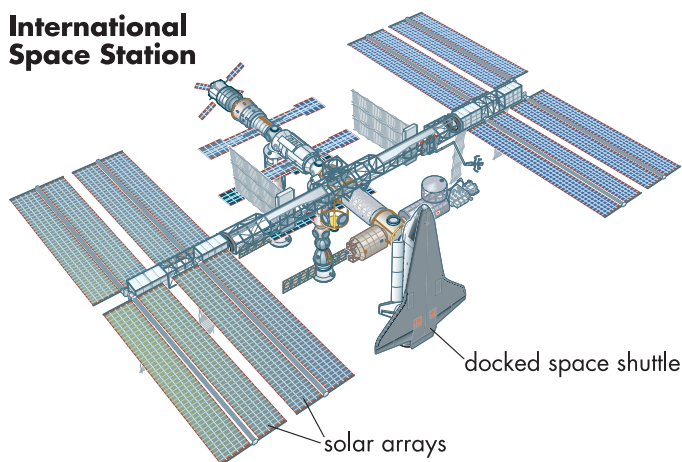
A satellite is a small object that orbits, or revolves around, a larger object in space. Satellites can be natural or artificial (made by people). All the planets in the solar system except Mercury and Venus have natural satellites. Earth's Moon is one example. Artificial satellites are sent into space to gather information. Most are launched into space by rockets.

The first artificial satellite was Sputnik 1. The Soviet Union launched it into orbit around Earth in 1957. The first successful U.S. satellite was Explorer 1. It was launched in 1958. Now dozens of new satellites are put into space every year. They orbit around Earth as well as the Moon, Venus, Mars, Jupiter, and other bodies.

Artificial satellites have many purposes. Scientific satellites collect information about space. The Hubble Space Telescope is a scientific satellite that orbits around Earth. It sees the sky more clearly than telescopes on the ground. Communications satellites help send telephone calls, radio and television programs, and computer information all over the world. Airplanes, ships, and cars with special equipment can use information from satellites to find the way from place to place. Militaries use satellites for spying. Satellites are used in weather forecasting, too.

A space station is a special kind of satellite used by astronauts. Astronauts can live on a space station for months

International Space Station



Sixteen different countries, including the United States, Russia, and Japan, began building the International Space Station in 1998. Space shuttles can dock at the station to deliver supplies and crew members.

while they gather information and do experiments.

► More to explore

Moon • Rocket • Solar System • Space Exploration

Saturn

Saturn is one of the planets that orbit, or travel around, the sun in the solar system. It is the second largest planet in the solar system, after Jupiter. It is known for its beautiful rings. The planet was named for the ancient Roman god of agriculture.

Saturn is the sixth planet from the sun. It travels around the sun at an average distance of about 885 million miles (1.4 billion kilometers).

Physical Features

Saturn is huge. Its diameter, or distance through its center, is about 74,900 miles

(120,600 kilometers). That is nine times larger than Earth's diameter. However, Saturn is very light for its size. It would float if placed in water.

Saturn is a kind of planet called a gas giant. It is made up mostly of gases, mainly hydrogen and helium. What looks like a solid surface in photographs is actually a layer of clouds. Under Saturn's huge layers of gases is a smaller area of hot liquid metal. At its center the planet probably has a hot, rocky core.

A system of very thin rings surrounds Saturn. The rings extend thousands of miles out from the planet. They are made up mostly of pieces of water ice and dust.

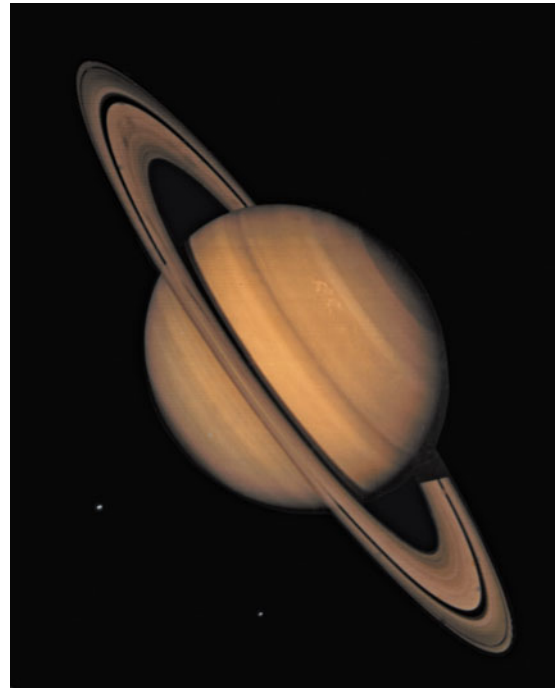
Orbit and Spin

Like all planets, Saturn has two types of motion: orbit and spin. It takes Saturn about 29 Earth years to complete one orbit, or path around the sun. In other words, a year on Saturn is about 29 Earth years.

Saturn spins very quickly about its center. It takes the planet less than 11 hours to complete one rotation. That is the length of a day on Saturn.

Moons

Saturn has eight major moons and many small ones. Altogether more than 40 moons orbit the planet. Its largest moon is Titan. Titan's atmosphere, or the layer of gases surrounding it, is very thick. Titan is the only moon in the solar system known to have a thick atmosphere and clouds. Other major moons include



Two of Saturn's moons can be seen as small dots to the left of the planet.

Dione, Tethys, Rhea, Hyperion, and Mimas.

Observation and Exploration

People have observed Saturn since ancient times because it can be seen from Earth without a telescope. In the 1970s the United States sent three unmanned spacecraft—named Pioneer 11, Voyager 1, and Voyager 2—to Saturn. They were the first spacecraft to fly by the planet.

An unmanned U.S. spacecraft named Cassini began orbiting Saturn in 2004. It dropped a European spacecraft called Huygens onto Titan. Huygens was the first spacecraft to land on a moon other than Earth's moon.

► More to explore

Planets • Solar System • Space Exploration

Saudi Arabia

Saudi Arabia is the largest country in the Middle East. It is also the largest producer of oil in the world. Saudi Arabia contains the two holiest cities in the religion of Islam. Its capital is Riyadh.

Geography

Saudi Arabia covers four fifths of the Arabian Peninsula, a large triangle of land between Africa and Asia. Saudi Arabia shares borders with Jordan, Iraq, Kuwait, Qatar, the United Arab Emirates, Oman, and Yemen. The Red Sea runs along the western border. The Persian Gulf lies to the east.

Almost all of Saudi Arabia's land is flat desert. The Rub' al-Khali desert in the southeast is the longest stretch of sand in the world. Its name means "empty quarter." A steep wall of mountains rises in the west.

Most of Saudi Arabia has little rainfall, very hot summers, and mild winters. There are no lakes or rivers that flow year-round. The country depends on underground water supplies.

Plants and Animals

Small shrubs and herbs are the main plants in Saudi Arabia. Some grasses and trees grow in the southwest, near the Red Sea. Date trees grow in oases, which are rare fertile spots in the desert.

Animals include foxes, wolves, hyenas, mongooses, porcupines, and baboons. Smaller numbers of gazelles, leopards,

and mountain goats also live in the country. A type of white antelope called an oryx is also found in Saudi Arabia, though it is very rare. The country's birds include falcons, eagles, ravens, and flamingos.

People

Saudis, or Arabs born in Saudi Arabia, make up most of the population. The rest of the people are mainly Arabs from other countries and South Asians. Some black Africans live along the Red Sea coast. Arabic is the main language.

Most Saudi Arabians live in cities and towns. The largest cities are Riyadh and Jiddah. Saudi Arabia's other major cities include Mecca and Medina, the two holiest cities in Islam. Every year millions of Muslims from around the world visit Mecca.





Camel racers compete in the King's Camel Race, an annual event in Riyadh, Saudi Arabia.

Almost all Saudi Arabians practice Islam. Following Islamic law, women and men are separated in public areas. Women also cover themselves with a black veil in public. Men traditionally wear head coverings and flowing white robes.

Economy

Saudi Arabia's economy depends on the production and sale of petroleum, or oil. The country also uses its oil to make fuels, chemicals, and other products. Other factories make cement, metal products, and processed food. Services—including tourism, banking, and communications—are also important to Saudi Arabia's economy.

Agriculture is limited in Saudi Arabia. Crops can be grown only in oases or by using artificial watering systems called irrigation. The crops include wheat, alfalfa, dates, tomatoes, and melons. Sheep, goats, and camels are the main livestock.

History

Humans have lived near the coasts of the Arabian Peninsula for thousands of years. In ancient times kingdoms on the peninsula controlled trade routes between Africa and Asia.

Birth of Islam

Muhammad, the founder of Islam, was born in Mecca in about AD 570. In 622 he moved from Mecca to Medina. This is said to mark the start of Islam. Before Muhammad died in 632, he brought most of the Arabian Peninsula under Islamic rule. In the following centuries Islam spread far beyond the peninsula.

Kingdom of Saudi Arabia

In 1517 the Ottoman Turks made the Arabian Peninsula part of the Ottoman Empire. The Ottomans held only loose control, however. Saudi ruling families held most of the real power.

In the 1700s the Sa'ud family joined with religious leaders to take control of the peninsula. By the end of the 1920s the leader Ibn Sa'ud had conquered all of what is now Saudi Arabia. In 1932 he

Facts About SAUDI ARABIA



Population
(2008 estimate)
24,780,000

Area
830,000 sq mi
(2,149,690 sq km)

Capital
Riyadh

Form of government
Monarchy

Major urban areas
Riyadh, Jiddah, Mecca, Medina, Ad-Dammam



Saudi men use computers at an Internet café in Saudi Arabia.

formed the Kingdom of Saudi Arabia. Sa'ud kings ruled Saudi Arabia into the 21st century.

Oil

Oil was discovered in Saudi Arabia in 1938. The country became a major supplier of oil to the United States and the rest of the Western world. The sale of oil allowed the Saudi government to build many new roads, schools, hospitals, and other buildings. Saudi Arabia became a leading power in the Middle East.

Modern Saudi Arabia

King Fahd took the Saudi throne in 1982. In 1990 Iraq invaded the neighboring country of Kuwait. King Fahd feared that Iraq might next invade Saudi Arabia. He invited the United States and other countries to put together a huge military force in his country. The military force defeated Iraq during the Persian Gulf War in 1991.



The Kingdom Centre towers above the surrounding buildings in Riyadh, the capital of Saudi Arabia. The building contains offices, apartments, shops, and a hotel. At the top is an observation deck.

In the late 1990s King Fahd passed much of his power to his half brother, Crown Prince Abdullah. After King Fahd died in 2005, Abdullah became king.

► More to explore

Arabian Peninsula • Arabs • Islam
• Mecca • Middle East • Persian Gulf War • Petroleum • Riyadh



TIMELINE

Islam begins on the Arabian Peninsula.

622

Ibn Sa'ud founds the Kingdom of Saudi Arabia.

1517

The Ottoman Empire takes over the peninsula.

Oil is found in Saudi Arabia.

King Fahd becomes the Saudi ruler.

1932

1938

1982

Saudi Arabia helps defeat Iraq in the Persian Gulf War.

1982

1991

Crown Prince Abdullah takes over the government.

1996

Sauk

The Sauk (or Sac) are a Native American group that probably once lived in what is now Michigan. By the 1600s, the Sauk had moved to what is now Wisconsin. They are closely related to a group of Native Americans called the Fox.

The Sauk traditionally grew corn, squash, and beans. They lived in villages in houses made from bark. After the harvest each year, the Sauk moved to their hunting grounds to fish and hunt animals, including bison (buffalo).

In the late 1700s the Sauk moved into what is now Illinois. In 1804 one Sauk group gave up its land to the United States. Many other Sauk became angry with this. Some Sauk people moved to what is now Iowa in 1830, but other



A Sauk warrior wears war paint on his face.

Sauk refused to leave their lands.

Among them was Black Hawk, a war chief. His people stayed in their village while U.S. settlers began to move onto their land.

The United States finally sent in troops to drive the Sauk from the village. The fighting that followed became known as the Black Hawk War of 1832. The Sauk were quickly defeated.

Settlers continued to move onto Sauk land. In the late 1800s the Sauk moved to what is now Oklahoma, where they shared a reservation with the Fox. They are sometimes considered one group called the Sauk and Fox tribe.

There were about 4,500 Sauk and Fox people in the United States at the end of the 20th century. They lived in Kansas, Nebraska, Oklahoma, and Iowa.

► More to explore

Black Hawk • Fox • Native Americans

Sault Sainte Marie Canals

The Sault Sainte Marie canals form one of the world's major canal systems. Ships use the canals to travel between Lake Superior and Lake Huron.

The system is made up of two canals along the Saint Marys River. This river connects Lake Superior and Lake Huron. Part of the river is very dangerous. The canals were built so that ships could get around this area. The United



States operates one of the canals. Canada runs the other one.

The Canadian canal is 1.4 miles (2.3 kilometers) long. It has a special device called a lock. The lock raises or lowers ships to the water level of the lake they want to enter. The U.S. canal is 1.6 miles (2.6 kilometers) long. It has four locks. They are nicknamed the Soo Locks.

The canals are very important to the economies of two cities. These cities are both named Sault Sainte Marie. They are located on either side of the Saint Marys River. One city is in the Canadian province of Ontario. The other is on Michigan's Upper Peninsula.

In 1669 French missionaries gave the name Sault Sainte Marie to the area around the Saint Marys River. The name means "the rapids of Saint Mary." The first large locks on the Michigan side

opened in 1855. Large locks on the Canadian side opened in 1895.

► More to explore

Canal • Huron, Lake • Superior, Lake

Scald

► see Burn and Scald.

Scarlet Fever

Scarlet fever is a disease named for the scarlet (red) rash it causes. Once common among children, scarlet fever is now rare.

The first symptoms, or signs, of scarlet fever are a high fever and a sore throat. The person may vomit and ache. About two days later a red, rough rash appears. It usually starts on the neck and chest and then spreads. The face also looks red, often with a pale area around the mouth. The tongue may have a whitish coating at first. When the coating disappears, the tongue is swollen and bumpy.



The arm of a young person shows the red rash of scarlet fever.

Symptoms last for about a week. Afterward the skin may peel.

Tiny living things called bacteria cause scarlet fever. The kind of bacteria that causes the disease also causes strep throat. The bacteria produce poisons that cause the red rash. The bacteria easily spread between people through contact. Hand washing helps to prevent the bacteria from spreading.

People with signs of scarlet fever should go to a doctor. Doctors treat scarlet fever with a type of drug called an antibiotic. Rest also helps. Cold foods can ease throat pain.

► More to explore

Disease, Human • Strep Throat

Schulz, Charles

Charles Schulz was the creator of the long-running “Peanuts” comic strip. Charlie Brown, Snoopy, and the other “Peanuts” characters made Schulz famous all over the world.



Charles Schulz

Early Life

Charles Monroe Schulz was born in Minneapolis, Minnesota, on November 26, 1922. He loved to draw as a child. His first published cartoon was a drawing of his small black-and-white dog, Spike. This drawing appeared in a newspaper in 1937. Spike later was the model for Snoopy of “Peanuts.”

Schulz joined the Army after leaving high school. He served in Europe during World War II (1939–45).

“Peanuts”

In 1947 Schulz began drawing a comic strip called “Li'l Folks.” “Li'l Folks” ran in a newspaper and a magazine. In 1950 Schulz sold “Li'l Folks” to a company that sells comic strips to newspapers. The company renamed the strip “Peanuts,” even though Schulz did not like the name.

“Peanuts” appeared in seven U.S. newspapers in 1950. By 1958 “Peanuts” appeared in 355 U.S. newspapers and 40 newspapers in other countries. “Peanuts” eventually ran in about 2,600 newspapers in 75 countries. Some 355 million people around the world read the comic strip.

Schulz's characters later appeared in several animated television specials. The first of these was *A Charlie Brown Christmas* in 1965. In 1967 the stage musical *You're a Good Man, Charlie Brown* opened in New York City. It became a favorite with audiences.

Retirement and Death

Schulz announced his retirement from drawing “Peanuts” in December 1999. He died in his sleep on February 12, 2000, the night before the final “Peanuts” strip appeared in newspapers.

► More to explore

Animation • Cartoon

Science

Science is a huge field of study. It deals with the search for knowledge about the universe and all that is in it. People who work in science are called scientists.

Branches of Science

Science includes a wide range of subjects. These subjects can be grouped into three branches: the physical sciences, the life sciences, and the social sciences.

Physical Sciences

The physical sciences deal with nonliving things—from the tiny particles that make up an atom to the universe itself. Physics is the study of matter and the forces that act on it. Chemistry is the study of substances. Astronomy is the study of stars, planets, and other objects in outer space. The Earth sciences are the study of Earth’s features. Mathematics, the study of numbers, is a physical science, too. It is also a tool used in almost every other area of science.

Life Sciences

The life sciences deal with living things and their surroundings. Biology is the study of the natural world and every-



Medical researchers work in a laboratory in Ghana.

thing that lives in it. Botany, the study of plants, and zoology, the study of animals, are fields within biology. Medicine is the science of health.

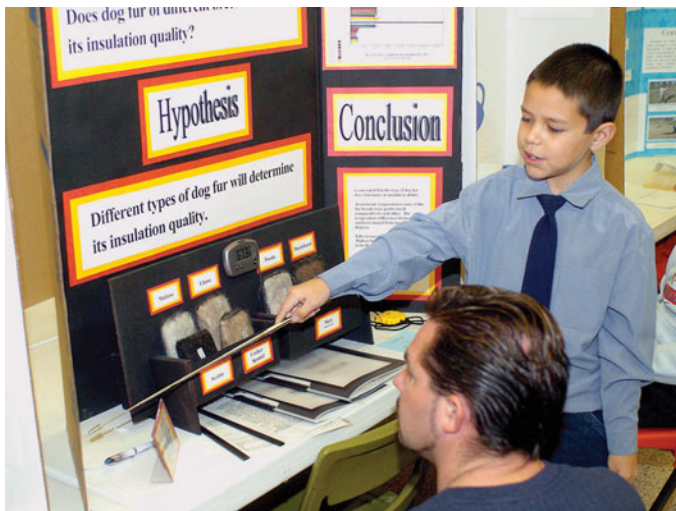
Social Sciences

The social sciences deal with human life and culture. Sociology is the study of societies, or the groups that people form. Psychology is the study of the human mind and emotions. Geography is the study of Earth’s surface. Anthropology is the study of humans through history. Economics is the study of wealth.

The Scientific Method

Scientists believe there is a natural explanation for most things. For any problem they see, they try to understand the cause so they can come up with a solution. By learning what causes a disease, for example, scientists can work to control its spread.

The process that scientists use to solve problems is called the scientific method. Scientists start by finding out as much as possible about a problem. They usually



A student explains his science fair project to a judge. Students who participate in science fairs use the scientific method to solve a problem or answer a question.

read articles and books. They want to discover what other scientists have learned about it. Then they make a hypothesis, or an educated guess, to explain it. They test the hypothesis with an experiment. If the hypothesis fails to explain the problem, the scientists revise the hypothesis and test it again.

If the hypothesis is correct, other scientists repeat the experiment. They want to make sure that they get the same results. If they do, the hypothesis is accepted as a theory, or an explanation for why something happens. A theory may later need to be changed if scientists discover new information about the subject.

► More to explore

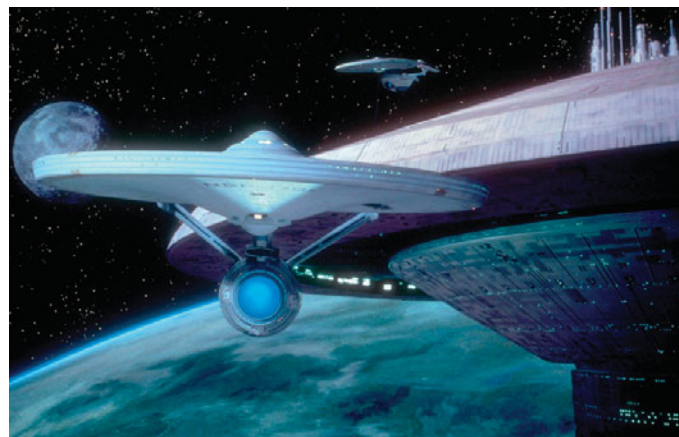
Anthropology • Astronomy • Biology
• Botany • Chemistry • Economics
• Geography • Mathematics • Medicine
• Physics • Psychology • Sociology
• Zoology

Science Fiction

Science fiction is a special type of fiction, or story. Humans have long wondered what life on another planet might be like. People have also wondered how different kinds of technology might affect life on Earth. Made-up stories that address such questions are called science fiction.

These stories may discuss ideas about scientific facts or real technology. But they also involve a lot of imagination. For example, a story might describe people meeting with space aliens for the first time. Another story might imagine what would happen if robots or computers could think and feel like humans. Many science fiction stories present different possible futures for human society.

Science fiction seeks largely to entertain. However, many science fiction stories also imagine different ways people might act and relate to one another. In this way



The science fiction movie *Star Trek III: The Search for Spock* shows what future spacecraft might look like.

science fiction may help reveal important things about human nature and society.

A few authors, such as Jules Verne and H.G. Wells, wrote science fiction in the 1800s or even earlier. But science fiction did not become a major type of writing until the 1900s. The first rockets sent into space and rapid advances in technology helped create an interest in this writing. Authors such as Isaac Asimov, Arthur C. Clarke, and Robert Heinlein helped establish the style as a form of serious literature.

Science fiction stories have also been the subject of television shows and movies in the 20th and 21st centuries. Popular examples include the *Star Trek* television shows and movies and the *Star Wars* series of movies.

► More to explore

Fiction • Literature

Scorpion

Scorpions are small animals with a curved tail that can deliver a poisonous sting. Of the 1,400 species, or kinds, of scorpion, about 25 can kill people with their poison. Most scorpions will not sting unless bothered. Scorpions are members of the group of animals called arachnids. They are relatives of spiders.

Scorpions are found throughout the world except in Antarctica. Many live in the desert, but they also can be found in grasslands, in caves, and in forests. They range in length from 0.5 inch to 8.3



A scorpion carries its stinger arched above its head.

inches (1.3 to 21 centimeters). The longest scorpion is the rock scorpion of South Africa. Most desert species are yellowish or light brown. Other species tend to be dark brown or black.

Like spiders, scorpions have four pairs of legs. They also have claws, which help the scorpion grasp prey. A scorpion carries its tail arched over its back. The tip of the tail has a sharp, hollow stinger. Poison is squeezed through the stinger to paralyze larger prey. For humans, medicine may be able to stop the effects of the poison if given shortly after the sting.

Scorpions hide for much of the day and come out at night to eat. They feed on insects and spiders, but larger species may eat lizards, snakes, mice, and other scorpions. Scorpions spend most of their time alone.

► More to explore

Spider

Scotland



Scotland is a part of the United Kingdom, a country of western Europe. The other parts of the United Kingdom are England, Wales, and Northern Ireland. Scotland covers the northern third of the island of Great Britain. It borders England to the south. The capital of Scotland is Edinburgh.

Geography

Scotland has three land regions. The Highlands, in the north, have rocky mountains and many lakes. The Central Lowlands are hilly and have Scotland's best farmland. The Southern Uplands have narrow, flat valleys between low mountains. Many small islands also belong to Scotland. These include the Orkney Islands, the Shetland Islands, and the Hebrides. Scotland's climate is mild and cool.

Heather, grasses, and shrubs cover much of Scotland. Peat bogs are common, too. These are swampy areas with wet, peaty soil.

People

The people of Scotland mostly belong to two groups. The Scots are descendants of the ancient people called Celts. They live in the Highlands. The rest of the people mainly have Anglo-Saxon roots, like the people of northern England. Scotland also has people with Irish, Lithuanian, Italian, Polish, Jewish, and South Asian roots. Almost all of the people speak English. A few people speak old languages called Scottish Gaelic and Scots. The main religion is Christianity.

Economy

Scotland's economy depends mainly on service industries such as tourism, finance, government, and real estate. Manufacturing businesses make computers, metals and metal products, clothing, chemicals, and foods. The oil and natural gas industries are also strong. Farmers raise cattle, sheep, pigs, and chickens. They grow wheat, barley, and potatoes. Fishing and forestry are important industries, too.



Urquhart Castle overlooks Loch Ness in Scotland. "Loch" means "lake" in the Scottish Gaelic language.

History

By the 1st century AD several different peoples had settled in what is now Scotland. The Romans invaded in about AD 80. Though the Romans had conquered England and Wales, they could not defeat the peoples of Scotland.

By the 400s four peoples had established kingdoms in the region: the Picts, the Britons, the Angles, and the Scots. The Scots were a group of Celts from Ireland. Between the 800s and the 1000s the kings of the Scots unified the peoples into one kingdom.

In 1296 the king of England invaded Scotland and declared himself its king. The Scottish people fought English rule. William Wallace and Robert the Bruce were heroes of the war for independence. In 1328 Scotland became independent with Robert as its king.

Scotland continued to clash with England for more than 250 years. But in 1603 Scotland and England were united under one king. Then, in 1707, Scotland's Parliament, or lawmaking body, was merged with England's. The entire island of Great Britain was then one kingdom, which was called Great Britain. In 1801 Ireland joined the union, creating the United Kingdom. (Most of Ireland later broke away from the union.)

In the 1900s many people in Scotland wanted more of a say in their government. In 1997 the people voted to create a new Scottish Parliament. It took control of many of Scotland's affairs.

The national Parliament in England still governed the United Kingdom as a whole.

► More to explore

Anglo-Saxon • Celt • Edinburgh
• England • Heather • Ireland
• Northern Ireland • Parliament
• United Kingdom • Wales

Scouting



A Cub Scout in the United States gathers newspapers for recycling.

The Boy Scouts and the Girl Scouts (also called Girl Guides) are groups that teach useful skills and good citizenship to boys and girls. Scouts often hike, camp out, and take part in other outdoor activities. Many countries around the world have scouting groups.

Boy Scouts

A British Army officer named Robert Baden-Powell started the Boy Scouts in 1907. In 1908 he published the first

Boy Scout handbook. This book introduced the Boy Scouts' motto, "Be Prepared."

Scouting soon spread around the world. The Boy Scouts of America started in 1910. It has several programs to serve different age groups. Tiger Cubs are 7 years old. Cub Scouts are 8 to 10, and Boy Scouts are 11 to 17. A Venturing program serves older youths.

The Boy Scouts have several ranks, or levels. A scout rises from one rank to the next by learning skills and performing services. A scout may also earn merit badges for learning new skills or studying new subjects.

The basic scouting group is called a troop. Scouts from many troops meet in gatherings called jamborees. A world jamboree takes place about every four years. As the 21st century began, more than 25 million children and teenagers from more than 200 countries were active in the Boy Scouts.

Girl Scouts

Very soon after the Boy Scouts began, many girls became interested in scouting. In 1910 Baden-Powell started the Girl Guides. Juliette Gordon Low started the Girl Scouts of the U.S.A. in 1912.

Girl Scouts serve their communities and countries in many ways. For example, they may gather food and clothing for the needy, help others learn to read, or work to protect the environment. Since



Indonesian Girl Scouts salute their country's flag.

the mid-1930s, Girl Scouts in the United States have sold cookies to raise money.

Like the Boy Scouts, the Girl Scouts are divided into age groups. A girl as young as 5 years old can be a Daisy Girl Scout. The Brownie Girl Scouts are 6 to 8, and Junior Girl Scouts are 8 to 11. Girl Scouts can be as old as 17 years. Girls, like boys, earn badges as a sign of their accomplishments.

The World Association of Girl Guides and Girl Scouts started in 1928. By the early 21st century, the association had more than 10 million members from 140 countries.

► More to explore

Citizenship

Sculpture

Sculpture is a branch of the visual arts. It involves the creation of artistic objects in three dimensions—length, width, and height. The main feature of a sculpture's

Did You Know?

The highest rank in the Boy Scouts of America is the Eagle Scout.

design is the way its forms extend through space. Size, texture, light and shade, and color are also important design elements. A sculpture may look exactly like a person or object or may reflect shapes and forms that the artist invents.

Sculpture may be either in the round or in relief. A sculpture in the round stands on its own. It can be viewed from all sides. A relief is attached to a background, so it is not designed to be viewed from the back. Reliefs often decorate buildings.

Materials

Clay has been one of the sculptor's chief materials since ancient times. Clay is easy to obtain and to use. Once early peoples learned to make bronze, metals became a popular choice for sculpture as well. Most metals are very strong and long-lasting. Sculptors value their color and shine. Wood has long been a popu-



A stone sculpture of an angel stands on a bridge in Rome, Italy.



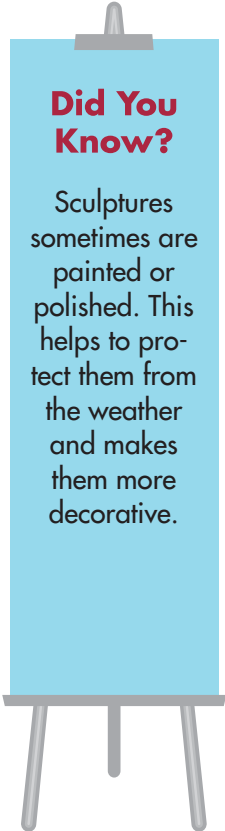
A woman sculpts a bust, or a figure of a person's head and shoulders, from clay.

lar material for carving. It is one of the main materials used by sculptors in Africa and Oceania. Sculptors have long used stone for outdoor statues and monuments because it resists damage by rain and wind. Popular types of stone for sculpture include marble, alabaster, granite, sandstone, limestone, and semi-precious stones.

Modern sculptors use these traditional materials as well as many others, including plastics, fabrics, fiberglass, neon tubes, and even garbage. Today, concrete is often used for large outdoor projects. This is because it is cheap, hard, and long-lasting.

Processes

The most common ways to form sculpture are carving, modeling, casting, and constructing. Carving is the process of turning such substances as stone, wood, or ivory into a desired shape by cutting or chipping away pieces. Modeling involves shaping a soft material such as clay by hand. It can then be baked until



Did You Know?

Sculptures sometimes are painted or polished. This helps to protect them from the weather and makes them more decorative.

it hardens. Models can also be used in casting.

Casting is used to reproduce a piece of sculpture through the use of a mold. In one version a plaster mold is made around a model. When the mold has hardened, it is split apart and taken off the model. The mold is then put back together, with a hollow space where the model was. A mixture of plaster and water is poured into the mold and left to dry. When the mold is chipped away, a perfect copy of the original model remains. A method of casting with wax is commonly used for metal sculptures. This process can be used to create many copies of a statue.

Modern sculptors sometimes construct sculpture out of assorted materials. They may use such techniques as welding, screwing, nailing, or gluing to combine different pieces of material.

History

Early Sculpture

Sculpture from prehistoric times has been found around the world. The earliest sculptures are made of such naturally occurring materials as clay, stone, and ivory. Beginning in about 3000 BC, people also began to make sculptures of bronze and other metals.

In early civilizations sculpture was associated largely with religion. In the Middle Eastern region of Mesopotamia almost all early sculpture was used in temples. People in ancient Egypt created huge sculptures of their kings and gods,

emphasizing their power. They also made many statues and reliefs for use in tombs.

In ancient Greece sculpture reached its high point in the 400s BC. The Greeks of this period aimed to show humans and gods in their most perfect forms. Most of their statues appear calm in expression and pose. The ancient Romans later made many copies of Greek sculpture. In this way they preserved the Greek tradition for later generations.

From about AD 200 the new religion of Christianity began inspiring artists to create works that reflected Christian figures and events. During the Middle Ages (from about 500 to 1500), much European sculpture was closely related to church architecture.

Sculpture in India has also centered on religion. The Gupta period, lasting from about the 300s to the 500s, produced some of the best examples of Buddhist sculpture.

Renaissance, Baroque, and Neoclassicism

The period in Europe called the Renaissance (mid-1300s through the 1500s) was a time of outstanding artistic achievement. Renaissance artists were inspired by the classical styles of ancient Greece and Rome. The Renaissance began in Italy. The Italian artists Donatello and Michelangelo were among the finest sculptors of the period.

In the 1600s baroque became a major style of Western art. Baroque sculpture is dramatic and highly decorative. It appeals to the senses and emotions. The leading baroque sculptor was the Italian artist Gian Lorenzo Bernini.

The neoclassical (meaning “new classical”) style was popular in Europe in the 1700s. As in the Renaissance, sculptors in this period sought to revive ancient Greek and Roman ideals of beauty. A leading sculptor of this style in Italy was Antonio Canova.

Modern Sculpture

In the late 1800s the French sculptor Auguste Rodin challenged centuries of tradition. He showed the human figure expressing tension and fleeting emotions. He also sometimes used textured surfaces that heighten the sense of life and movement. In these ways Rodin’s sculpture differs from the cold, impersonal smoothness of the classical tradition. With their strong sense of power and drama, his works greatly influenced sculptors of his own time as well as of the modern era.

In the 1900s and beyond, sculptors experimented with form and materials. Sculptors such as Constantin Brancusi, Henry Moore, Barbara Hepworth, and Raymond Duchamp-Villon created works of abstract sculpture—sculpture that does not try to realistically represent anything in the visible world. Instead, these sculptors focused on the shapes and forms themselves. Some sculptors used objects found in the everyday world to make viewers see the



An abstract sculpture by Barbara Hepworth is on display at a sculpture garden at the University of California, Los Angeles.

objects in a different light. Their aim was not to please the eyes but to make the viewer think about what art is and can be.

► More to explore

Arts • Drawing • Michelangelo
• Painting • Pottery

Sea Anemone

Sea anemones look like flowers but are actually animals. Their “petals” are arm-like body parts called tentacles, which circle the mouth. The tentacles may be



The jewel anemone is a kind of sea anemone.

red, yellow, green, blue, orange, brown, white, or a mixture of colors. Sea anemones use their tentacles to sting the shrimps, fish, and other small animals that they eat.

There are more than 1,000 species, or kinds, of sea anemone. They live in oceans throughout the world.

Sea anemones are invertebrates, which means they do not have a backbone. They have soft bodies that may be thick and short or long and slender. Most of the body is made up of water. Sea anemones range from less than an inch (2.5 centimeters) to about 5 feet (1.5 meters) across.

Most sea anemones rarely move. Some glide very slowly or do slow somersaults. Sea anemones are usually found attached to a hard surface such as a rock, a sea-shell, or the back of a crab. A flattened disk attaches the animal to an object by suction. Some sea anemones float near the ocean's surface or burrow deep into sand or mud.

Sea anemones are related to jellyfish. Like a jellyfish, a sea anemone can sting a person who touches it. The sting can cause pain or sickness.

► More to explore

Jellyfish • Ocean

Sea Horse

A sea horse is an unusual fish with a horselike head. There are more than 20



A sea horse uses its tail to anchor itself to undersea plant life.

species, or types, of sea horse. They live in warm and mild seas.

Sea horses are small fish. They are about 1 to 12 inches (4 to 30 centimeters) long. Instead of scales, a sea horse has bony rings covering its body. Sea horses can be bright yellow or orange, or they can be brown or black. Some are striped or speckled. They often blend in with nearby plants.

A sea horse usually spends its life in one small area near the shore. It wraps its curled tail around seaweed or coral to keep from being swept out to sea. Sea horses swim in an upright position. They are weak swimmers.

Sea horses feed constantly. They eat tiny creatures such as brine shrimp. A sea horse sucks food into its tiny mouth through its snout.

Did You Know?

In some countries people eat sea anemones. Cooking the sea anemone gets rid of the poison.

Sea horses are unusual in the way they reproduce. The female lays her eggs in a pouch beneath the male's tail. The male carries the eggs until they hatch. The baby sea horses look like small adults.

Many people like sea horses because of their interesting appearance. Some people keep sea horses in aquariums. In some places people use sea horses in medicine.

► More to explore

Fish

Seal

Seals are mammals that live mostly in cold seas. They are related to the walrus. There are more than 30 species, or kinds, of seal. They can be divided into two groups: earless, or true, seals and eared seals. Earless seals actually do have ears, but they do not stick out. Eared seals have visible ears. Sea lions are eared seals with a thick, hairy neck that looks like a lion's mane.

Seals are found throughout the world. They are especially plentiful in seas near



the North and South poles. Some species like the open ocean. Others prefer to live along the coast. All seals spend some time on islands, beaches, or sheets of ice. They come ashore to breed.

A seal's body is round in the middle and narrower at the ends. The skin is usually brown, gray, or black. The smallest seals are about 4 feet (1.2 meters) long and weigh about 200 pounds (90 kilograms). The largest seals can be 21 feet (6.5 meters) long and weigh more than 8,000 pounds (3,600 kilograms). They are called elephant seals.

Instead of legs, seals have two pairs of flippers. Flippers help seals to swim. Eared seals can turn their rear flippers forward under the body. This allows them to scoot around while on land.

The ears of true seals do not stick out.



The ears of true seals do not stick out.

Earless seals cannot turn their rear flippers forward. They move on land by wriggling on their bellies. They also may pull themselves forward with their front flippers.

Seals eat mostly fish. Some also eat squid and shellfish. The leopard seal of the Antarctic feeds on penguins and other seals.

► More to explore

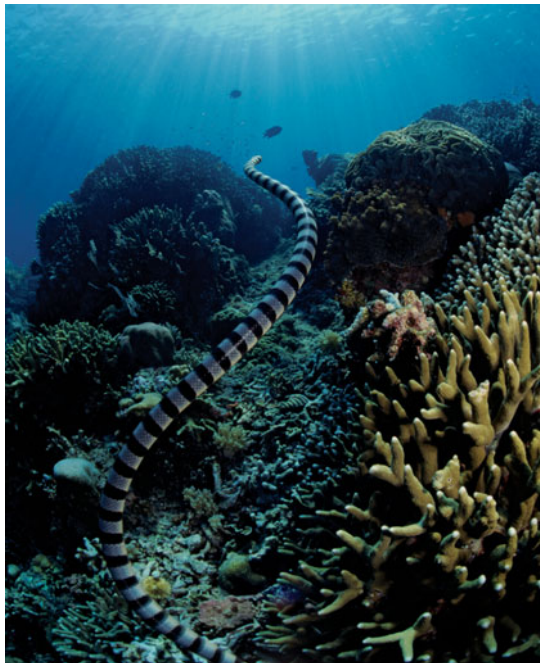
Mammal • Walrus

Sea Serpent

► see Animals, Legendary.

Sea Snake

Sea snakes are snakes that spend most of their lives in water. They usually swim in groups. From far away, a group can look



The banded sea krait is a sea snake of the Pacific Ocean.

like one long snake. For this reason, sea snakes may have inspired legends about giant sea serpents.

Sea snakes belong to the same family as cobras. There are about 50 species, or types, of sea snake. Most are found in Asia, Australia, and the Pacific Islands. Sea snakes live in warm, coastal waters. They can also be found in rivers, lakes, and swamps. Only the yellow-bellied sea snake swims hundreds of miles out into the ocean. This sea snake is also the only known reptile that spends its entire life in water.

Most sea snakes are 3 to 5 feet (0.9 to 1.5 meters) long. Many have light-colored bodies with dark rings. Sea snakes have short, hollow fangs that contain venom, or poison. This venom attacks the nervous system (nerves and brain) and can be deadly. Sea snakes eat eels, fish, and fish eggs.

Sea snakes are specially made for the water. They have a flat tail that is shaped like an oar. The snakes swim by moving the tail from side to side. Their lungs can also hold extra oxygen. This allows them to stay underwater for long periods. Some sea snakes have very small belly scales. These scales make them unable to crawl on land.

► More to explore

Cobra • Snake

Season

As a year passes, regular changes occur in the weather. This cycle of weather

changes is divided into four parts, known as the seasons. The four seasons are winter, spring, summer, and autumn, or fall.

What Causes the Seasons

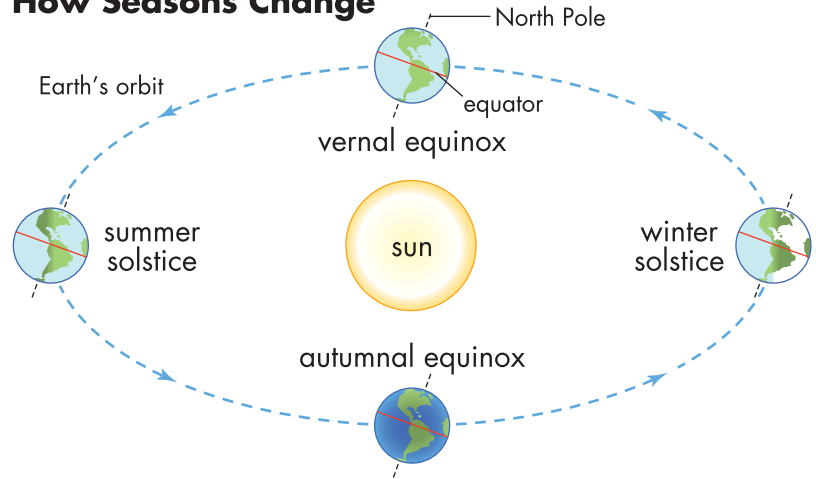
The seasons are related to the way sunlight falls on different parts of Earth in the course of a year. As Earth revolves around the sun, the North Pole points to the same direction in space. For about six months of every year the North Pole is tilted toward the sun. During this time the Northern Hemisphere gets more direct sunlight than the Southern Hemisphere. The Northern Hemisphere also gets more hours of daylight. During the other six months the North Pole is tilted away from the sun. The Southern Hemisphere then gets more direct sunlight and more hours of daylight.

When the Northern Hemisphere is getting the most sunlight, it experiences its warmest season—summer. At the same time, the Southern Hemisphere is getting the least sunlight, so it experiences its coldest season—winter. The seasons in the Northern and Southern hemispheres are always opposite.

When the Seasons Begin

Summer begins on the summer solstice, which is the day with the most hours of daylight. This is June 21 or 22 in the Northern Hemisphere. It is December 21 or 22 in the Southern Hemisphere. Winter begins on the winter solstice, which is the day with the fewest hours of daylight. In the Northern Hemi-

How Seasons Change



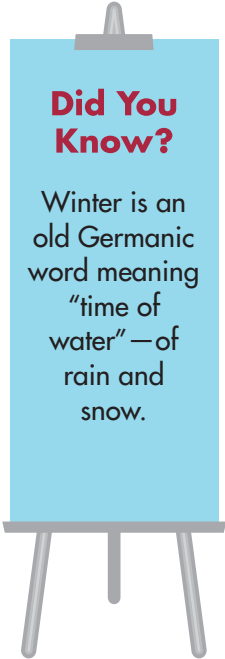
A diagram shows the position of Earth at the beginning of each season in the Northern Hemisphere.

sphere this is December 21 or 22. In the Southern Hemisphere the winter solstice is June 21 or 22.

Autumn begins on the autumnal equinox. This is September 22 or 23 in the Northern Hemisphere. It is March 20 or 21 in the Southern Hemisphere. Spring begins on the vernal equinox. In the Northern Hemisphere this is March 20 or 21. In the Southern Hemisphere it is September 22 or 23. On both equinoxes the hours of daylight are equal to the hours of darkness everywhere on Earth.

Effects of the Seasons

The changes in weather during each season depend on how close a region is to the equator. Places at the equator get the most sunlight throughout the year. For this reason there is little difference from one season to the next. There may be rainy or dry periods, but temperatures are generally warm year-round.



Did You Know?

Winter is an old Germanic word meaning “time of water”—of rain and snow.

The North and South poles are the farthest points from the equator. Therefore temperatures stay cold throughout the year. During the winter it is dark even in the daytime. In the summer the sun shines late at night. However, this “midnight sun” is not strong enough to give the poles hot weather.

Between the poles and the equator, temperatures may vary greatly from one season to the next. During winter, the weather is generally cold and often snowy. Some animals hibernate, or sleep for a long time. Many birds have migrated, or moved to warmer places for the season. Some plants die, and others stop growing.

When spring arrives temperatures become warmer. Plants and trees produce new leaves and flowers. Birds return from their winter homes, and animals come out of hibernation.

During the summer, temperatures reach their highest levels. There are more hours of daylight, and the sun is more intense. This extra sunshine helps plants to grow.

Temperatures fall again as autumn begins. Some trees and plants lose their leaves. Animals with fur grow thicker coats to keep them warm during the coming winter. Many birds travel to warmer places.

► More to explore

Earth • Equator • Hemisphere
• Weather

Seed

Most plants begin life as seeds. Plants form their seeds inside flowers or cones. In flowering plants a fruit often surrounds the seeds.

Seeds need the right conditions to germinate, or grow into a new plant. They need air, water, the right temperature, good soil conditions, and the right amount of light.

Features

A seed contains a miniature plant, called an embryo, that can develop into a fully grown plant. The outer shell of a seed, called a seed coat, protects the embryo. Inside the seed a nutritious material provides food to the embryo. In flowering plants this material is called endosperm.

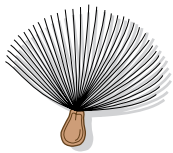
Germination

Once a seed has formed, it leaves its parent plant. Seeds often can stay dormant, or inactive, for many years before they germinate, or grow. Because of this, people can store seeds and plant them later. A seed will germinate once it is in the ground and the conditions are right.

As germination begins, parts of the embryo break out of the seed coat. One part grows downward. It becomes the plant's roots, which take in water and food from the soil. Other parts grow upward. They become the plant's stem and leaves, which absorb sunlight.

How Seeds Travel

by the wind



milkweed

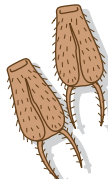


dandelion

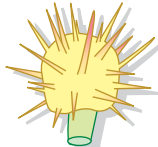


maple

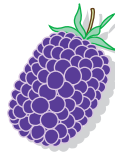
by animals



beggar-ticks



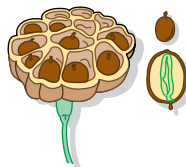
sandbur



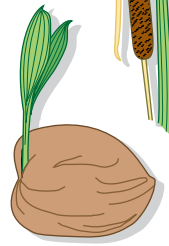
blackberry

by water

lotus



cattail



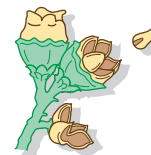
coconut

by bursting

violet

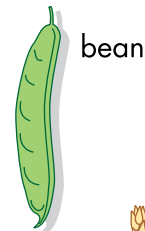


jewelweed



witch hazel

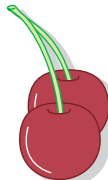
by humans



bean



wheat



cherry

How Seeds Travel

It is important that seeds travel away from their parent plant. If the seeds land nearby, they compete with the parent for light and water. This means that they are less likely to survive.

Seeds travel in many ways. Some plants have fruits or pods that burst open to scatter the seeds inside. The wind blows lightweight seeds. Some seeds, such as those of dandelions, have fluffy parts that help them to drift through the air. Some plants, such as coconut palms, drop their seeds in nearby water. These seeds have waterproof coverings that let them float far away.

Animals also carry seeds to other places. Seeds with sticky or prickly seed coats stick in the fur of animals. The seeds drop to the ground later. When birds and other animals eat fruit, the seeds

pass through their bodies and often end up far from where they ate the fruit.

Uses

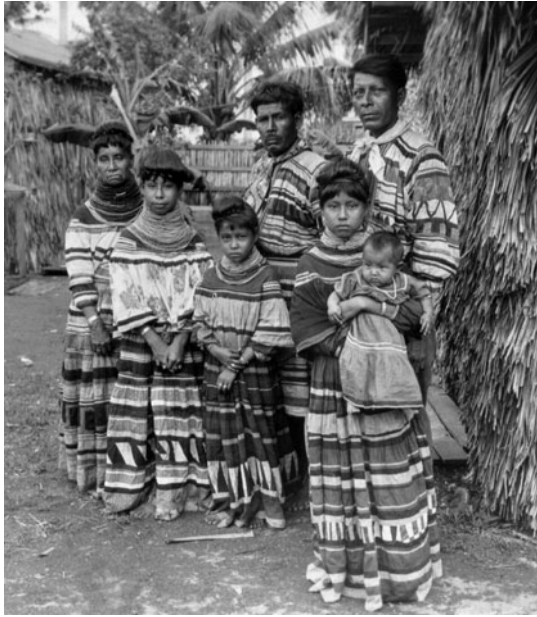
Seeds are an important source of food for people and animals. Seeds used for food are often called grains or beans. People also use seeds to make oils, spices, fabric dye, and jewelry.

► More to explore

Bean • Flower • Fruit • Grain • Plant

Seminole

The Seminole are Native Americans who were once part of the Creek tribe of the U.S. state of Georgia. In the 1700s they broke away from the Creek and moved southward into northern Florida. The name Seminole probably came from the Spanish word *cimarrón*, which means “wild” or “runaway.”



A photograph taken in the 1920s shows a group of Seminole wearing traditional clothing. They are standing in front of their houses.

The Seminole lived in villages. A chief ruled each village. The Seminole made their homes by covering wooden frames with roofs of branches, grass, and bark. They grew corn, squash, beans, and pumpkins. They also hunted, fished, and gathered wild plants.

After the Seminole reached Florida, they were joined by runaway slaves from Georgia. In 1817–18 U.S. troops tried to recapture the slaves by attacking Seminole towns. This conflict became known as the First Seminole War.

In 1832 the U.S. government tried to get the Seminole to move to Indian Territory (now Oklahoma). Most refused. From 1835 to 1842 they fought U.S. troops in the Second Seminole War. After the war most Seminole moved to Indian Territory.

A few hundred Seminole were able to stay in Florida by hiding in the swamp-lands. In the 1850s U.S. troops tried to force them out. That conflict was called the Third Seminole War.

At the end of the 20th century there were about 12,000 Seminole. Most lived in Oklahoma or Florida.

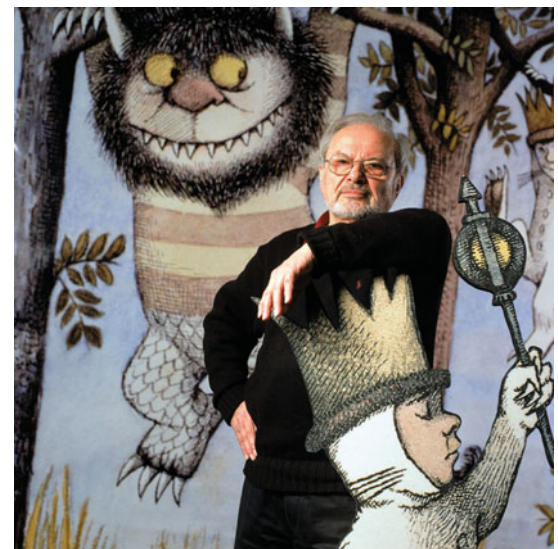
► More to explore

Creek • Native Americans

Sendak, Maurice

Maurice Sendak is a U.S. artist and children's author. Many of his picture stories blend true-life situations with imaginary scenes. He is best known for his 1963 book titled *Where the Wild Things Are*.

Maurice Bernard Sendak was born on June 10, 1928, in New York City. As a child Maurice drew pictures and wrote



Maurice Sendak stands among enlargements of the pictures he drew for *Where the Wild Things Are*.

stories. After high school he trained at an art school in New York City.

The first children's books Sendak illustrated were Marcel Aymé's *The Wonderful Farm* (1951) and Ruth Krauss's *A Hole Is to Dig* (1952). Sendak went on to illustrate more than 80 children's books by a number of different authors.

In the mid-1950s Sendak began writing and illustrating his own books. In 1963 Sendak published *Where the Wild Things Are*, which made him famous. In 1964 Sendak earned the Caldecott Medal for his illustrations for the book.

In the 1970s Sendak turned his talents to television and theater. He created opera versions of some of his stories, and he designed sets for the stage. Sendak also continued producing children's books into the 1990s.

► More to explore

Literature for Children

Seneca

The Seneca were the largest of the five Native American tribes that formed the Iroquois Confederacy. The tribes of the confederacy lived in what is now the U.S. state of New York. They all spoke similar languages. The Seneca traditionally lived in western New York.

Like the other Iroquois, the Seneca lived in longhouses. Longhouses were large, rectangular homes made of a wooden frame covered with bark. For food, the



Cornplanter was a chief of the Seneca in the 1700s.

Seneca grew corn, beans, and squash. They also fished and hunted.

In the 1600s European traders began arriving in Seneca territory. The Seneca traded furs with them for guns and metal tools. During the American Revolution (1775–83) the Seneca sided with the British. After the Americans won the war, the Seneca lost much of their land. A small group of Seneca fled to Canada, but most stayed in New York. In 1817 some Seneca settled in Ohio. In 1831 they gave up this land in return for land in Indian Territory (now Oklahoma).

At the end of the 20th century there were about 9,000 Seneca in the United States. Most lived in New York and Oklahoma. Another 1,000 lived in Canada, mainly in Ontario.

► More to explore

Iroquois • Native Americans



Senegal

The country of Senegal sits on the west coast of Africa. Senegal has produced several famous writers, including Léopold Senghor, the country's first president. Dakar is the capital and largest city.

Geography

The Atlantic Ocean forms Senegal's western border. Senegal shares land borders with Mauritania, Mali, Guinea, Guinea-Bissau, and The Gambia. The Gambia extends into Senegal from the coast. The small part of Senegal south of The Gambia is called the Casamance region.

Most of the land is flat and low. In the west are small plateaus, or areas of flat, raised land. Low mountains rise in the east. Senegal has four major rivers: the Senegal, the Saloum, the Casamance, and the Gambia. Most of the country is



Baobab trees grow in a grassy area of Senegal.

hot year-round. The south gets more rain than the north.

Plants and Animals

Grasses and scattered trees grow in much of Senegal. Forests are thicker in the south. Mangrove trees grow along the southern coast.

Senegal's animals include monkeys, panthers, warthogs, and wild dogs. Some chimpanzees, elephants, hippopotamuses, antelope, lions, and leopards live in a national park in the southeast.

People

Senegal has several large ethnic groups, including the Wolof, the Fulani, the Serer, the Tukolor, the Diola, the Malinke, and the Soninke. The Wolof are the largest group. French is the national language, but most people speak the language of their group. Most of the people follow the religion of



Islam. More than half of the population lives in the countryside.

Economy

Most of Senegal's people work in agriculture. Peanuts are a major crop. Other important crops include rice, sugarcane, millet, watermelons, cotton, and vegetables. Senegal sells a lot of fish to other countries.

Senegal's industries produce peanut oil, ships, fertilizers, and petroleum products. Senegal also mines salt and phosphates, which are used to make fertilizers. Tourism, communications, and other services have become important parts of the economy.

History

Humans have lived on the land that is now Senegal since prehistoric times. The Tukolor people settled in the area almost a thousand years ago. At about the same time Berbers from the north began

spreading Islam throughout the region. The Wolof, the Serer, and other peoples later developed kingdoms.

European Trade

European explorers reached the area in the 1400s. The first to arrive were the Portuguese. The Dutch, the English, and the French came later. The Europeans set up trading posts along the coast beginning in the 1600s. They traded African slaves, ivory, gold, and a useful plant material called gum.

French Rule

In 1895 Senegal became a part of the large French colony of French West Africa. In 1958 Senegal became a separate state within the French Community, a group of countries with ties to France. Senegal soon left the community, however, and formed a union with Mali. In 1960 Senegal separated from Mali to become an independent country.

Independent Senegal

Léopold Senghor became Senegal's first president. He was a poet who had led the movement for independence. In 1982 Senegal and The Gambia formed a union called Senegambia. The union broke apart in 1989. Meanwhile rebels in the Casamance region began fighting Senegal for independence. The rebels and Senegal's government signed a peace agreement in 2004.

► More to explore

Dakar • Gambia, The



Peanuts are piled high on a truck near Fatick, Senegal.

Facts About SENEGAL



Population
(2008 estimate)
12,688,000

Area
75,955 sq mi
(196,722 sq km)

Capital
Dakar

Form of government
Republic

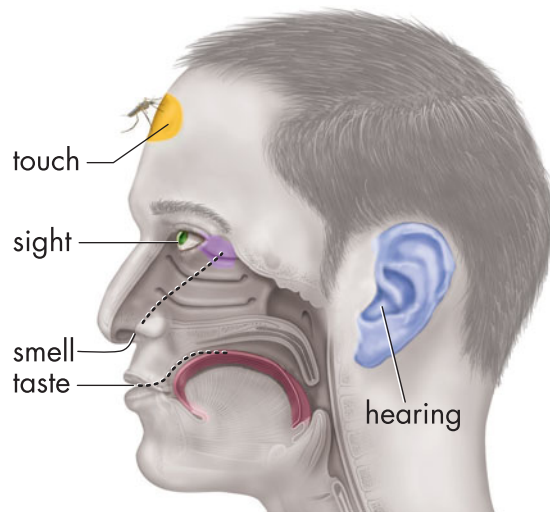
Major cities
Dakar, Thiès,
Kaolack, Saint-
Louis, Mbour,
Ziguinchor

Senses

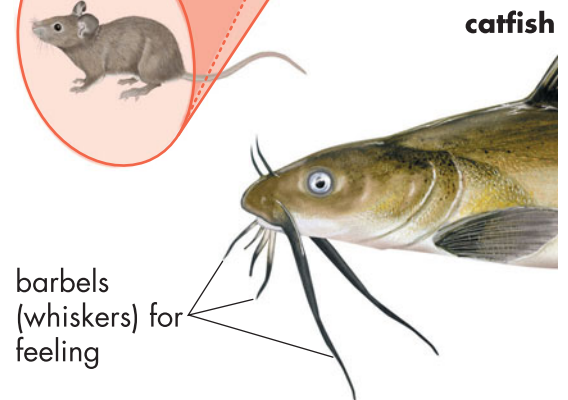
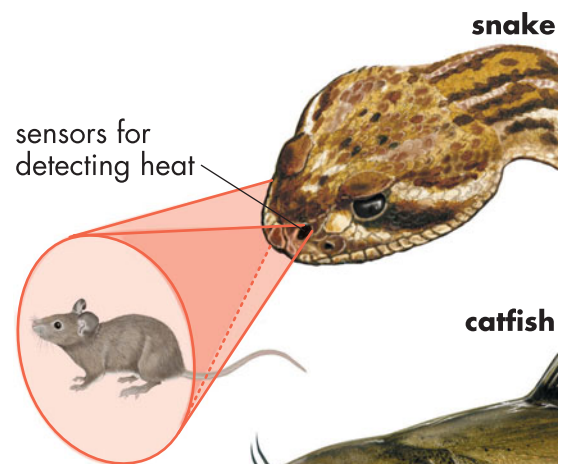
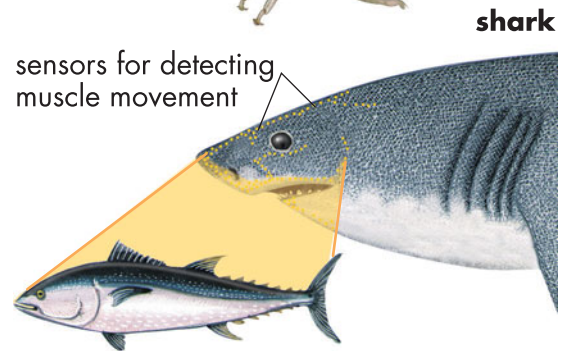
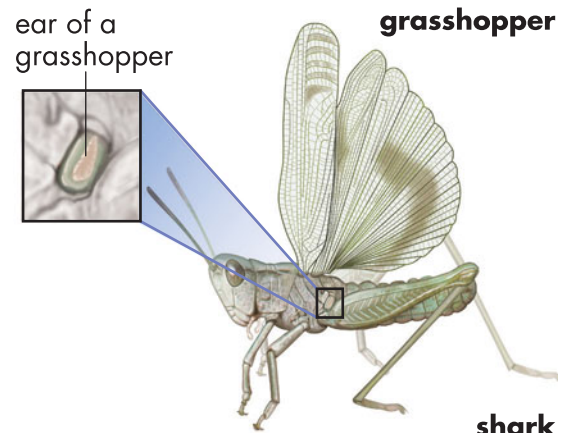
The senses help humans and other animals react to changes in their surroundings and inside their bodies. Animals receive sensory information all the time. They see a bug dart across a pond. They hear the roar of a lion. They smell a rose. They taste fresh bread. They touch a jagged piece of ice. They get dizzy from spinning in a circle.

After the body takes in sensory information, sense cells send the information to the brain. Sense cells are also called receptors. The information travels from receptors to the brain through nerves. The brain thinks about the information and then makes the body react to it.

The five basic senses are sight, hearing, smell, taste, and touch. The eyes sense sight. The ears sense sounds. The skin senses touch. On the tongue, taste receptors are found in structures called taste buds. They identify sweet, salty,



Humans use their skin, eyes, nose, tongue, and ears to sense information in the world around them.



Different animals have special body parts to sense sound, movement, heat, touch, and other information.

sour, bitter, and meaty tastes. The nose detects smells. The receptors in the nose also help with the sense of taste.

In addition to the five basic senses, nearly all animals sense motion, heat, cold, pressure, pain, and balance. The sense of motion—knowing where the arms and legs are and where to move them—is called kinesthesia. The sense of balance, or equilibrium, is controlled by structures in the inner ear. These structures help keep the body in balance and prevent falls.

► More to explore

Ear • Eye • Nervous System • Nose
• Skin • Tongue

Seoul



Population
(2008 estimate)
10,421,780

Seoul is the capital of South Korea, a country in eastern Asia. Before 1948 South Korea and North Korea were one country. For hundreds of years during that period Seoul was the capital of all of Korea. The city's name itself has come to mean "capital" in the Korean language.

Seoul is one of the largest cities in the world. It is also South Korea's center of culture, education, business, and industry. It lies on the Han River.

The economy of Seoul is very important to South Korea. Many of the country's



Kyongbok Palace was built in Seoul in 1394. Most of the original buildings on the grounds were destroyed in invasions and wars. Some buildings have been rebuilt.

banks and insurance companies have their headquarters in the city. Factories in Seoul make clothing, machinery, electronics, processed foods, and other products. Printing is another leading industry.

People have lived in the Seoul area for thousands of years. A royal summer palace was built at the site in 1068. After that a large settlement was established there.

In 1394 the Choson rulers of Korea made Seoul the capital. The Choson ruled Korea until 1910. Japan controlled Korea from 1910 to 1945. Seoul remained the capital under Japanese rule. During that time Seoul was called Kyongsong.

Seoul was damaged during the Korean War (1950–53). Afterwards it was rebuilt and expanded greatly. The modern city

has many skyscrapers and an extensive transportation system. The city hosted the Summer Olympic Games in 1988.

► More to explore

Korea, North • Korea, South • Korean War

Sequoia

The term sequoia refers to two different North American trees: the giant sequoia, also called the big tree, and the redwood. Both trees were named in honor of Sequoyah, a distinguished Native American of the Cherokee people.

► More to explore

Giant Sequoia • Redwood

Sequoyah

Sequoyah was an important member of the Cherokee group of Native Americans. He invented a system of writing so his people could read and write in their own language.

Sequoyah was born in about 1760 or 1770 in what is now Tennessee. He was probably the son of a British trader and a Cherokee woman. Sequoyah was raised by his mother and became a talented artist. From 1813 to 1814 he fought for the U.S. Army in the Creek War. This was a war between the U.S. government and the Creek Native Americans.

In about 1809 Sequoyah began working on a system of writing. The Cherokee people had their own spoken language,



Sequoyah invented a system for reading and writing the Cherokee language.

but they did not have a way to write in it. Sequoyah hoped that a written language would help the Cherokee to stay independent from white settlers.

Sequoyah used symbols to stand for each syllable used in the Cherokee language. (A syllable is a unit of sound.) His daughter helped him to pick out all the syllables in the Cherokee language. By 1821 he had created a system of 86 symbols that stood for all the Cherokee syllables.

Sequoyah's system, called a syllabary, soon became popular with other Cherokee. It was easy to use. The Cherokee began to teach it in their schools. They also published books and newspapers in their own language.

Sequoyah's people honored him for his accomplishments. He died in 1843.

► More to explore

Cherokee • Native Americans • Writing

Did You Know?

Sequoyah used letters from the English, Greek, and Hebrew alphabets to create his Cherokee symbols.

Serbia

Serbia is a country in southeastern Europe. It was a republic, or state, of the country of Yugoslavia for much of the 1900s. In the 1990s all of Yugoslavia's republics except Serbia and Montenegro became independent countries. In 2006 Serbia and Montenegro each became independent countries as well. The capital of Serbia is Belgrade.

Geography

Serbia is in the Balkan region of Europe. It shares borders with Kosovo and the countries of Montenegro, Bosnia and Herzegovina, Croatia, Hungary, Romania, Bulgaria, and Macedonia.

The Danube River flows through the northern part of the country, which is flat. The area south of the Danube is mainly mountainous. Most of the country has cold winters and warm summers.

Plants and Animals

Forests of oak and beech trees grow in the lower areas. Pine and fir trees grow in the mountains. The country's animals include deer, foxes, wolves, wild pigs, bears, and many types of birds.

People

Serbs make up most of the population. Small groups of Hungarians, Croats, Bosniacs (Bosnian Muslims), Roma (Gypsies), Montenegrins, and others also live in the country.

Most Serbs are Eastern Orthodox Christians. They speak Serbo-Croatian. About half of the people live in cities or towns.

Economy

Manufacturing is an important part of the economy. Factories make machinery, metals, chemicals, food products, electronics, cloth, cars, trucks, and other goods. The mining industry produces aluminum, copper, and lead.

Agriculture is also important. The major crops are corn, sugar beets, wheat, and potatoes. Farmers also grow grapes to make wine. Pigs, sheep, and cattle are the main livestock.

History

People have lived in the Balkan region for thousands of years. Slavic peoples, including the Serbs, settled in the area by the 600s. The Ottoman Empire con-





Farmers grow corn on a hillside in Serbia.

quered the Serbs in 1389. Serbia gained independence in the 1800s.

In 1914 a Serb assassinated Francis Ferdinand, the archduke (prince) of Austria. In response, Austria declared war on Serbia. This conflict turned into World War I.

Yugoslavia

After the war, in 1918, Serbia joined with Montenegro, Croatia, Slovenia, Macedonia, and Bosnia and Herzegovina to form a new country called the Kingdom of Serbs, Croats, and Slovenes. In 1929 the country was renamed Yugoslavia.

Communists took control of Yugoslavia after World War II ended in 1945. Yugoslavia had a strict Communist government until the late 1980s.

Civil War and Beyond

In 1991 and 1992 four of Yugoslavia's republics declared independence. Serbia wanted to keep Yugoslavia together. The republics fought a civil war until 1995. At the end of the war the republics of

Croatia, Slovenia, Macedonia, and Bosnia and Herzegovina were independent countries. Only Serbia and Montenegro remained in Yugoslavia.

After the war Albanians in the Serbian province of Kosovo also began fighting for independence. In response, Serbs attacked many Albanian villages. The fighting ended in 1999, but problems continued between Yugoslavia's Albanians and Serbs. The United Nations temporarily took over the government of Kosovo.

In 2003 the republics of Serbia and Montenegro formed a new union that gave each republic more independence. Montenegro broke away from the union in 2006. In 2008 Kosovo declared independence from Serbia. Other countries supported the move, but Serbia refused to recognize Kosovo as a separate country.

► More to explore

Balkan Peninsula • Belgrade
• Communism • Kosovo • Montenegro
• Yugoslavia



Boats travel on the picturesque Danube River in Belgrade, Serbia.

Facts About SERBIA



Population
(2008 estimate)
7,352,000

Area
29,922 sq mi
(77,498 sq km)

Capital
Belgrade

Form of government
Republic

Major cities
Belgrade, Novi Sad, Nis, Kragujevac

Serra, Junípero

Junípero Serra was a Spanish priest. In 1769 he founded the first mission (Christian community) in California at the Spanish settlement of San Diego. The Spanish established missions in North America to spread Christianity to Native Americans.

Serra was born on the Spanish island of Majorca on November 24, 1713. He became a priest in the Roman Catholic church. In 1750 he arrived in Mexico City to work as a missionary. He worked there until 1767, when he was sent to California to start missions there.

From 1770 to 1782 Serra founded eight more Californian missions. He died in Carmel, California, on August 28, 1784.

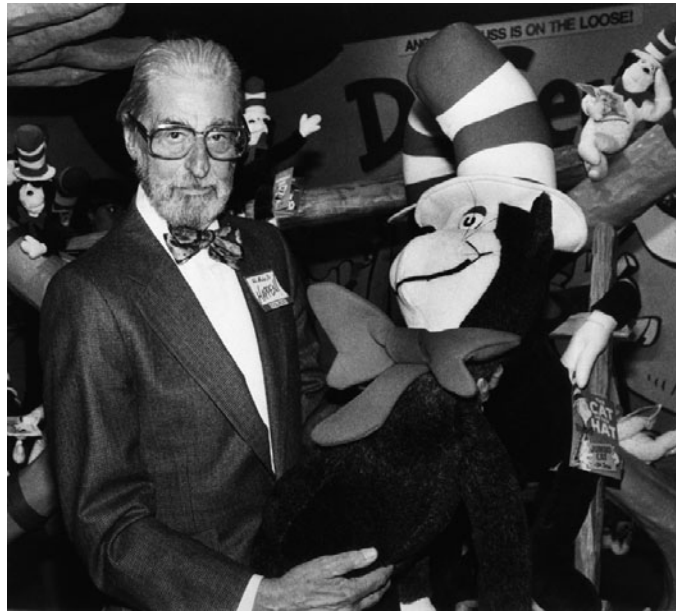
► More to explore

Missions, Spanish

Seuss, Dr.

The author Theodor Seuss Geisel is better known to readers as Dr. Seuss. He wrote nearly 50 books for children. His stories are famous for their nonsense words, wild rhymes, and amusing drawings of unusual creatures.

Geisel was born on March 2, 1904, in Springfield, Massachusetts. He graduated from Dartmouth College in New Hampshire in 1925. Then he studied at Oxford University in England and the Sorbonne, a college in France. After that he worked as an illustrator and cartoonist.



Dr. Seuss poses with a Cat in the Hat toy.

During and after World War II (1939–45) Geisel served in a part of the U.S. Army that made informational films. Two films he made during the war won Academy awards.

Geisel's first children's book, *And to Think That I Saw It on Mulberry Street*, was published in 1937. He wrote it under the name Dr. Seuss. His most famous books include *Horton Hears a Who* (1954), *How the Grinch Stole Christmas* (1957), *The Cat in the Hat* (1957), *Green Eggs and Ham* (1960), *The Lorax* (1971), and *Oh, the Places You'll Go!* (1990). Geisel both wrote the stories and drew the pictures for his books.

In the late 1950s Geisel started a company called Beginner Books, which produced books for children. Geisel died on September 24, 1991, in La Jolla, California.

► More to explore

Literature for Children



Seychelles

The country of Seychelles is a scattered group of islands in the western Indian Ocean. The capital, Victoria, is on the largest island, Mahé.

Geography

Seychelles lies about 1,000 miles (1,600 kilometers) east of Africa. It includes more than 100 islands divided into two groups: the Mahé group and the coral-line group. The Mahé islands are rocky and mountainous. The coralline islands are flat and made of coral.

Plants and Animals

Seychelles is home to the rare coco de mer, or double coconut tree. Avocados, breadfruit, bananas, mangoes, papayas, and pineapples also grow on the islands. Animals include green sea turtles, giant tortoises, and many types of bird.

People

Most of the people are Seychellois Creole. They have a mixture of Asian, Afri-



Seychelles is known for its fine beaches.

can, and European ancestors. The most common language is Creole. Creole is a mixture of French, English, and African languages. Roman Catholicism is the main religion. Most Seychellois live in cities or towns, mainly on Mahé Island.

Economy

Tourism is a major source of money for Seychelles. Fishing is another important part of the economy. The country's main product is canned tuna. Farmers grow coconuts, cinnamon, bananas, and tea. They also raise pigs and chickens.

History

No one lived on the islands until the 1700s, when French settlers arrived with their African slaves. In 1814, after losing a war, France gave the islands to Great Britain. Seychelles gained independence from Britain in 1976.

► More to explore

Indian Ocean • Victoria

Facts About SEYCHELLES



Population
(2008 estimate)
85,500

Area
176 sq mi (455 sq km)

Capital
Victoria

Form of government
Republic

Major city
Victoria



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Shakespeare, William

William Shakespeare is often praised as the world's greatest playwright. Though he lived 400 years ago, his plays are still studied and enjoyed today.

Early Life

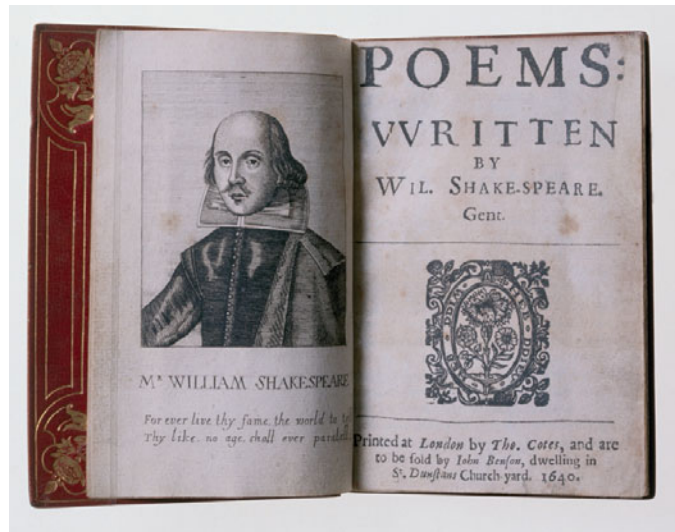
William Shakespeare was born in 1564 in the town of Stratford-upon-Avon, England. He had three younger brothers and two younger sisters. His father was a glove maker who later became the mayor of Stratford.

When Shakespeare was 18, he married Anne Hathaway. What Shakespeare did to support his young family is unknown. Some scholars think that he was a schoolteacher. Others think that he traveled with a group of actors.

Career in the Theater

By 1592 Shakespeare was working as a writer and actor in London. In that year a disease called the black plague devastated the city. Officials closed the theaters and other public places to stop its spread. Shakespeare then turned to writing poetry.

London's theaters reopened in 1594. By then Shakespeare had joined an acting group called Lord Chamberlain's Men. They often presented plays for royalty. Along with acting and writing, Shakespeare also was involved with the business side of theater. He became wealthy.



A collection of William Shakespeare's poems, printed in 1640, included a picture of the author.

Plays

Shakespeare wrote 37 plays in 20 years. His plays generally fall into three categories: tragedies, comedies, and histories. Tragedies are plays that describe the downfall of the main character. Shakespeare's most famous tragedies include *Hamlet*, *King Lear*, and *Macbeth*. Comedies are humorous plays that end happily. Shakespeare's comedies include *A Midsummer Night's Dream*, *As You Like It*, and *The Taming of the Shrew*. Shakespeare's histories are dramas about some of England's powerful kings, including Henry IV and Richard II.

Later Years

Shakespeare retired from the theater in about 1610. He returned to his hometown of Stratford-upon-Avon. He died there on April 23, 1616.

► More to explore

Drama • Poetry

Shamrock



Several different plants that have three-part leaves are sometimes called shamrocks. The redwood sorrel is one such plant. It grows in the redwood forests of western North America.

A shamrock is a plant whose small, green leaves are divided into three heart-shaped parts called leaflets. Shamrocks are a symbol of Ireland, especially on Saint Patrick's Day.

Several different plants are known as shamrocks. They include some members of the pea family: white clover, small hop or suckling clover, and black medic. Wood sorrel is another plant called a shamrock. The plants all grow in the temperate, or mild, regions of the Northern Hemisphere. Experts disagree on which plant, if any, is the true Irish shamrock.

In rare cases a shamrock leaf has four leaflets instead of three. Finding a shamrock with four leaflets supposedly brings good luck.

► More to explore

Pea • Saint Patrick's Day

Shark

Sharks are fast-swimming fish that have a skeleton made of cartilage instead of bone. (Cartilage is an elastic tissue that is created before bone begins to form.) They are related to rays. Sharks are among the oldest animals on Earth. The first sharks lived more than 300 million years ago. Today there are more than 300 species, or types, of shark.

Where Sharks Live

Most sharks live in oceans in the mild or warm parts of Earth. But the Greenland shark lives in the cold Arctic waters. Sand sharks spend most of their time at the bottom of shallow water. The Portuguese shark lives in the deepest parts of the ocean.

Physical Features

The whale shark is the largest living fish. It can reach about 50 feet (15 meters) long and weigh nearly 20 tons. The smallest shark is the dwarf lantern shark, which is only about 7.5 inches (19 centimeters) long.



Sharks move restlessly to keep from sinking to the ocean floor.

Most sharks have a pointed snout that extends forward over the mouth. However, hammerhead sharks have a wide, flat head. A shark's teeth are sharp and triangular and grow throughout its life. Only a few species, including the white shark, the tiger shark, and mako sharks, have very large teeth. Sharks have a muscular, upturned tail and pointed fins.

Sharks normally have tough, gray skin with toothlike scales. Their skin also may be cream, yellow, brown, bronze, blue, or nearly black in color. They often are patterned with spots, bands, or marbling.

Behavior

Sharks use their sharp sense of smell to find food. They may eat plankton, shellfish, sea turtles, fish, seals, porpoises, squid, or whales. Sharks circle their prey and frequently approach from below. When excited by the smell of blood, sharks may have a "feeding frenzy." This means that they attack any object within reach and feed rapidly.

Sharks swim constantly to keep from sinking. They are known for their speed in the water. Most species can swim 20 to 30 miles (32 to 48 kilometers) per hour. But the speed of mako sharks has been recorded at more than 60 miles (97 kilometers) per hour.

Most sharks live by themselves. But a few, such as the spiny dogfish shark, form schools, or groups.



A hammerhead shark gets its name from its wide, flat head.

Reproduction

Sharks reproduce in one of three ways. In some types the female gives birth to live young. In other types the young hatch from eggs inside the female's body and then are born. In still other types the female lays rectangular, leathery eggs that become attached to rocks or seaweed. The young hatch days or weeks later. Female sharks may have from 2 to about 20 young at a time.

Sharks and Humans

People eat the meat of some sharks, including thresher and mako sharks. Only some species—including the white shark and the tiger shark—are considered dangerous to humans. When these sharks are hungry, disturbed, or defending their territory, they may attack humans. Even the movement and noises of swimmers can cause some sharks to attack. However, shark attacks are rare.

► More to explore

Fish • Ray

Shawnee



A Shawnee man wears a traditional headdress and feathers.

The Shawnee are Native Americans who traditionally lived over a large area in what is now the eastern United States. Their first known homeland was centered in what is now Ohio.

During the summer the Shawnee lived in wigwams. Wigwams were dome-shaped homes made from a frame of wood poles covered with bark. The women grew corn and other food crops. The men hunted. During the winter the Shawnee moved to hunting camps.

In the 1600s the Iroquois people drove the Shawnee from their lands. The Shawnee scattered. After 1725 many Shawnee returned to Ohio.

The Shawnee fought repeatedly to defend their lands against white settlers who wanted to expand westward. In 1794 U.S. troops defeated the Shawnee in the battle of Fallen Timbers. In 1795 Shawnee leaders signed a treaty in which they gave up their Ohio lands.

Some Shawnee refused to leave the area. Among them was Tecumseh, who organized a confederacy (group) of tribes to fight the Americans. Tecumseh died in battle in 1813. His confederacy fell apart soon afterward.

By the late 1800s most Shawnee had settled in Indian Territory (now Oklahoma). At the end of the 20th century there were more than 6,000 Shawnee. Most lived in Oklahoma.

► More to explore

Iroquois • Native Americans • Tecumseh

Sheep

Sheep are among the most valuable of all domestic animals. Domestic animals are ones that have been tamed for use by humans. People eat sheep meat and drink sheep milk. The animals' wool is used to make cloth. Male sheep are called rams. Female sheep are called ewes. Sheep are closely related to goats.

There are more than 200 breeds of sheep. They are found on every continent except Antarctica. Sheep can be



A ewe watches over two lambs.



The Swaledale is an English breed of sheep with curling horns.

either wild or domestic. Most sheep like to live in high and dry areas.

Adult sheep weigh 80 to 400 pounds (35 to 180 kilograms). Some sheep have horns. They curl in loops alongside the head. Certain types of wild sheep have very long horns. The horns of the big-horn sheep can be more than 3.3 feet (1 meter) in length. Most domesticated sheep grow a thick coat of fibers called wool. Wild sheep grow both hair and wool.

Sheep eat grass and plants. They often graze in large groups, or flocks. Sheep have four separate stomach compartments, or sections. They regurgitate their food (bring it back up from the stomach) and chew it again. This helps the stomach fully digest the food.

People raise sheep for their meat, milk, and wool. The meat of an adult sheep is called mutton. Meat from a younger

sheep is called lamb. Some people drink sheep milk. It is also used to make cheese. Certain types of sheep are raised specifically for their wool. These include Merino and Rambouillet sheep.

► More to explore

Goat

Shell

Every empty seashell on the beach once contained an animal known as a mollusk. Clams, oysters, scallops, conchs, mussels, and snails are all types of mollusks. The shells of these animals are exoskeletons, or hard, outside skeletons that protect their soft bodies.

Structure

All mollusk shells are made of a mineral called calcium carbonate. To form a shell, the mollusk's body gives off substances that contain calcium carbonate. The substances harden into layers of shell. As the animal grows, its shell also gets bigger to make room for its body.



Shells come in many shapes, colors, and patterns.

Mollusk shells differ greatly in shape, size, color, and texture. The way a shell looks can help a mollusk avoid enemies. Bright colors or patterns may scare away enemies. Textures and colors that match the surroundings help a mollusk to hide from enemies.

Shells are also put together in various ways. Snails and conchs have single shells in the shape of a twisted cone. These mollusks are called univalves. Clams, oysters, scallops, and mussels have shells with two halves joined on one side. These mollusks are called bivalves. Chitons have shells made of eight overlapping plates.

Uses

The main purpose of a mollusk's shell is to protect its body. When in danger, a mollusk can quickly pull its entire soft body into the hard shell.

Shells have other purposes, too. Some shells have ridges that keep the animal anchored to the ocean floor. Other shells are smooth, which allows the animal to burrow easily into mud or sand. Shells with long spines trap food.

Many people collect shells. They may use them to make buttons and jewelry and in other crafts. In the past, peoples in Africa, North America, and the Pacific islands used shells as money.

Other Types of Shells

Some animals other than mollusks also have hard coverings called shells. Sea animals from the crustacean family—for example, crabs, lobsters, and shrimps—

have shells that do not grow. Turtles and tortoises have shells made from bone.

The covering of an egg is also called a shell. Eggshells protect developing birds and reptiles until they hatch. The coverings of many nuts and seeds are known as shells, too.

► More to explore

Bivalve • Exoskeleton • Mollusk

Shinto



Strips of paper with prayers written on them hang outside a Shinto temple in Japan.

More than 100 million people follow a system of religious beliefs and practices known as Shinto. They are called Shintoists. Most of them live in Japan.

The word Shinto means “the way of *kami*.” *Kami* are superior powers that Shintoists honor. They may be natural objects and creatures (such as the spirits

Did You Know?

About 100,000 different shell-making mollusks are known to exist.

of mountains and animals), worthy human beings (such as emperors), or gods and goddesses. Shintoists believe that the *kami* are the source of human life. The *kami* reveal truth to people and guide them.

One of the most important *kami* is the sun goddess, Amaterasu. Shintoists believe that she was the ancestor of the first emperor of Japan. A major Shinto shrine, or place of worship, in the city of Ise honors this goddess.

Shinto does not have a central book to guide followers or regular weekly services. Shintoists can visit shrines any time they wish. Some people go every day. Many Shintoists also practice Buddhism. Some houses have both Shinto and Buddhist altars set up for prayer.

Festivals during the year bring Shintoists together. There may be cleansing rituals, food offerings, prayers, music, and dance. Major celebrations include a kind of thanksgiving and a new year festival.

Little is known about Shinto's origins. It was already strong by the time Buddhism came to Japan in the AD 500s. The two religions mixed for hundreds of years.

In the late 1800s the Japanese government made Shinto the main religion of Japan. It encouraged people to worship at Shinto shrines. It made people believe that the emperor of Japan was a god.

These efforts ended in 1945, after Japan's loss in World War II.

► More to explore

Buddhism • Japan

Ship

A ship is a large boat that can carry passengers or cargo for long distances over water. People have been using ships for transportation, exploration, and war since ancient times.

Parts of a Ship

Most ships are much larger than most boats, but they have many of the same parts. As on boats, the front of a ship is called the bow. The back is the stern. A ship's left side is known as the port side. The right is the starboard side.

A ship's frame, or body, is called the hull. The keel is like the ship's backbone. It is a central beam that runs along the bottom of the ship from front



A cargo ship loaded with freight containers passes the Golden Gate Bridge near San Francisco, in the U.S. state of California.



Many airplanes can be seen on the flight deck of an aircraft carrier.

to back. The keel keeps the ship from tipping over.

Ships usually have many decks. The decks are like the floors of a building. Cabins for passengers, engine and control rooms, and spaces for cargo are often on different decks.

An engine inside the ship provides energy to propellers at the back of the ship. The propellers push the ship through the water. The rudder, which is also at the back of the ship, helps in steering. When the ship is not moving, a heavy metal anchor may be lowered into the water. This keeps the ship from floating away.

Types and Uses of Ships

People use different types of ships for many different purposes. Some of the main types are trade ships, warships, industrial ships, and pleasure vessels, or cruise ships.

Trade ships carry different types of cargo. Container ships carry cargo pack-

aged in large containers. General cargo ships carry lumber, farm products, and other goods that are hard to ship in containers. Bulk ships carry coal, grains, and other loose cargo. Tankers carry oil and other liquid cargo. Refrigerated ships, or reefers, carry meat, fish, and other products that need to stay cold.

Navies use several different kinds of warships. The largest are aircraft carriers. A carrier has a large flat surface called a flight deck that airplanes can use for takeoffs and landings. Other types of military ships include cruisers, destroyers, and submarines. Submarines are ships that can travel underwater.

Industrial ships are sometimes called factory ships. Some industrial ships are oil rigs. They have big machinery that pumps oil from the ocean floor. Another type of factory ship processes fish that the crew catches at sea.



A cruise ship towers over pleasure boats in a harbor.

Before airplanes made long-distance travel quick and easy, people traveled in ships called ocean liners. Ocean liners had dining rooms and cabins where guests could sleep. Today this type of ship is called a cruise ship. Cruise ships carry tourists and vacationers to seaside locations around the world.

History

In early times people moved ships with oars. Many early ships also used the wind to move across the seas. These ships had sails—large, raised pieces of cloth that caught the wind. Ancient Egyptian warships had at least 40 oars and a single sail. The powerful longships of the Vikings also had oars and one sail.

By the 1400s European ships had several sails. Sailing ships known as galleons carried large guns along their sides for making war. In the 1800s long, slim ships called clippers also had several sails.

Ships were made mainly of wood until the middle of the 1800s. At that time iron ships began to replace wooden ones. Steam-powered engines also began to replace sails.

Today most ships are made of steel or other modern materials. They have internal-combustion engines that run on diesel fuel or gas. Some modern ships run on nuclear power.

► More to explore

Boat • Exploration • Submarine
• Transportation • War

Shoshone



A photograph from about the 1890s shows a Shoshone man named Heebe-tee-tse.

The Shoshone (or Shoshoni) are Native Americans of the western United States. They are historically divided into four groups. The Western Shoshone traditionally lived in what are now Nevada, California, and Utah. The Northern Shoshone lived in what are now Idaho, Utah, Montana, and Oregon. The Wind River (or Eastern) Shoshone lived in what is now Wyoming. The Comanche were part of the Wind River Shoshone before they split off and moved to what is now Texas.

The Western Shoshone ate mostly roots, nuts, seeds, fish, and small animals. Some Western Shoshone built huts covered with brush or bark mats. Others lived in caves.

The Northern Shoshone fished and collected wild roots. The Wind River Shoshone hunted for food. By 1700 the Northern and Wind River Shoshone had gotten horses. They began to travel to the Great Plains to hunt bison (buffalo). There they started to use tepees covered with bison skins for housing.

The U.S. explorers of the Lewis and Clark Expedition visited the Shoshone in 1805. Soon after that fur traders, Mormon settlers, and miners began arriving in the Shoshone territory. By the mid-1800s many Shoshone had died from diseases brought by the newcomers.

The U.S. government pressured the surviving Shoshone to move to reservations. At the end of the 20th century there were about 10,000 Shoshone living in the United States.

► More to explore

Comanche • Lewis and Clark Expedition • Native Americans



A shrew looks out from its burrow.

Shrews are among the world's smallest mammals. Some measure only 2.5 inches (6.4 centimeters), including the tail. Shrews have brownish gray fur and sharp teeth. A pointed snout overhangs the lower lip. Shrews have bad eyesight but a good sense of smell.

Some shrews are active both day and night. Others are active only at night. Shrews usually eat more than their body weight in food each day. Some birds of prey and snakes eat shrews. However, most animals will not eat shrews because shrews can give off a bad smell.

A female shrew gives birth to 2 to 10 young at a time. The furless, blind babies mature quickly. Most shrews live only one to three years.

► More to explore

Mammal

Shrew

The animals called shrews look like mice. But unlike mice, shrews are not rodents. Instead shrews belong to a group of insect-eating mammals called insectivores. There are more than 300 species, or types, of shrew.

Shrews live mostly in moist places north of the equator. They hide in the grass or dig underground burrows. Except when mating, shrews live alone.

Did You Know?

Shrews are nervous creatures. Shock from a loud noise or a rough touch can kill them.

Shrimp

► see Crustacean.

Sierra Leone

Sierra Leone is a small country on the coast of West Africa. Its name means “lion mountains.” It was named for the hills that surround the country’s main harbor. The capital is Freetown.

Geography

Sierra Leone shares borders with Guinea and Liberia. The Atlantic Ocean lies to the west. Most of the coast is flat and swampy. The northern coast has some mountains. Central Sierra Leone is flat in the north and hilly in the south. Mountains rise in the east. The climate is hot and humid.

Plants and Animals

Grasslands cover the north. Forests grow on the hills and mountains. Palm trees are common. Sierra Leone’s animals include monkeys, chimpanzees, tigers, porcupines, antelope, and crocodiles.

People

The largest groups of people are the Mende and the Temne. Creoles form a small group. Their ancestors were slaves who returned to Sierra Leone after being freed. Most of the people speak Krio, a mixture of English and African languages. About half of the people follow Islam. Many others follow traditional African religions. Most of the people live in the countryside.

Economy

Sierra Leone is a very poor country. Most people are farmers. Crops include rice, cassava, peanuts, and sweet potatoes. Sierra Leone has rich supplies of diamonds.

History

People have lived in what is now Sierra Leone for thousands of years. Portuguese explorers arrived in the 1400s. In the late 1700s and early 1800s the British helped freed slaves settle on the coast. The settlement became known as Freetown. During the 1800s the British took control of the area.

Sierra Leone gained independence from Great Britain in 1961. From 1991 to 2002 rebel groups fought a war against the government. The civil war forced hundreds of thousands of people to leave the country.

► More to explore

Freetown • Slavery



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Facts About SIERRA LEONE



Population
(2008 estimate)
5,969,000

Area
27,699 sq mi
(71,740 sq km)

Capital
Freetown

Form of government
Republic

Major cities
Freetown, Koidu,
Makeni, Bo,
Kenema

Sierra Nevada



The mountain range called the Sierra Nevada has some of the highest peaks in the United States. It runs along the eastern edge of California. It also reaches into western Nevada. Sierra Nevada is a Spanish name that means “snowy range.”

The Sierra Nevada is about 400 miles (640 kilometers) long. Its highest peak is Mount Whitney, at 14,494 feet (4,418 meters). Mount Whitney is the highest mountain in the United States outside of Alaska.

Winds from the west bring warm air from the Pacific Ocean to the mountains. The winds also carry a lot of moisture. Most of the moisture falls as rain or snow on the western slopes. The eastern slopes are dry.

Evergreen forests on the western slopes include cedars, pines, and firs. The best-known trees of the mountains are giant sequoias. They are the largest trees in the

world. The dry eastern slopes have sagebrush, juniper, and aspen.

Black bears and a few grizzly bears live in the Sierra Nevada. Smaller mammals of the mountain forests include American badgers, bobcats, flying squirrels, and golden beavers.

Native Americans once lived in the Sierra Nevada. The first Europeans to arrive were Spanish explorers and missionaries. They visited in the 1700s. In 1848 settlers found gold nuggets in mountain streams. That discovery started the California gold rush. Fortune seekers came to the area from all over the world.

Today tourism is the most important part of the region’s economy. Yosemite, Kings Canyon, and Sequoia national parks attract tourists with their beautiful scenery. Lake Tahoe is also popular with visitors.

► More to explore

California • Giant Sequoia • Mountain



Dawn reaches Mount Whitney in the Sierra Nevada.

Sign Language



A teacher uses sign language to communicate with her hearing impaired students.

Through hand movements rather than speech, people using sign language can communicate their thoughts and feelings. Around the world there are more than 100 sign languages, which are mainly used by deaf people. Most deaf people in North America use American Sign Language (ASL).

What Is Sign Language?

People using sign language make shapes, called signs, with their hands and arms. They also move their bodies and make facial expressions. Signs can stand for letters, words, or ideas. For example, to make the sign for cat, ASL users hold their hands up to their faces and “draw” whiskers with their fingers.

Sign languages are unique languages. ASL has different rules of grammar and different slang than spoken English. ASL

is also different from other sign languages, including British Sign Language and Mexican Sign Language.

History

Throughout history both hearing and deaf people have used some signs to communicate. For example, babies quickly learn to point at things they want. Often people use a system of signs to communicate with others who speak different languages.

In the 1700s a priest in France taught deaf children a system for spelling out French words with hand gestures. The system became French Sign Language.

In 1817 Thomas Hopkins Gallaudet founded the first permanent school for the deaf in the United States. He had learned French Sign Language from a teacher in France. Gallaudet taught his students the French signs. ASL was formed by combining Gallaudet’s teachings with signs that deaf people already used among themselves.

► More to explore

Deafness • Language

Did You Know?

Native Americans who could not understand each other’s languages used sign language to communicate.

Sikhism

Sikhism is a religion of India that was started by a man named Nanak. He was the first of the 10 gurus, or teachers, of the Sikhs. Most Sikhs live in the state of Punjab in northwestern India.

Sikhs believe that there is one God. All people are considered equal and have the opportunity to become one with God.



A Sikh leader reads from the *Adi Granth*.

But first they must overcome self-centeredness by honoring God, working hard, and sharing with others.

Many Sikhs belong to the order called the Khalsa. Members of the order avoid alcohol, tobacco, and drugs and devote themselves to prayer. The men carry swords. They must not cut their hair or beards and must cover their hair with a headdress called a turban.

The main Sikh temple is the Hari-mandir, or Golden Temple, in Punjab state. The Sikh religious book is called the *Adi Granth* (First Book). It contains nearly 6,000 hymns, or songs praising God, written by Nanak and other gurus.

According to Sikh tradition, in the late 1400s Nanak saw a vision of God, who ordered him to begin preaching. Nanak attracted many followers and became the first of the 10 gurus. The last human guru was Gobind Singh, who died in 1708. Gobind Singh created the Khalsa as an armed brotherhood. He felt that Sikhs were being mistreated by India's rulers. He was succeeded as guru by the

Adi Granth, or *Guru Granth Sahib* (Guru Granth Personified).

In the 1840s the Sikhs fought two wars with British forces in the Punjab region. The British controlled India at the time. The Sikhs were defeated, and the Punjab became part of British India.

In 1947 British India gained independence as two separate countries, India and Pakistan. The traditional lands of the Sikhs were divided between the two. Most Sikhs settled in India, but the Sikhs and India's Hindu majority quarreled. In 1984 Indian soldiers killed hundreds of Sikhs in an assault on the Golden Temple. Later that year the Indian prime minister was killed by two of her Sikh bodyguards. The murder led to more violence against Sikhs. Because of this, many Sikhs began demanding the establishment of a separate Sikh state. In 2004 Manmohan Singh, a Sikh, was appointed prime minister of India.

► **More to explore**
India

Silk

Silk is a valuable fiber made mostly by insects called silkworms. It is used to make high-quality clothing, sheets, and other things.

Natural Silk

Silkworms are actually caterpillars, not worms. A silkworm builds a case called a cocoon around itself for protection while it changes into a moth. It makes

the cocoon with silk that comes out of a tube in its head. The silkworm wraps a single long strand of silk around itself over and over again.

Some spiders also make silk. They weave silk webs to catch insects to eat. However, the silk made by spiders is too thin for making cloth.

The Silk Industry

In the silk industry, silkworms are raised from the time they are eggs until they have made a cocoon. In nature, a silkworm breaks open its cocoon to come out as a moth. Silkworms used for industry are killed with hot air or steam inside the cocoon. This way the cocoon is not damaged.

To process silk, the cocoons are first put in hot water. This softens the cocoons so the silk can be unwound. Several cocoons are unwound at the same time to form a single strand. Then several strands are twisted together to make



A silkworm spins its cocoon.

thicker, stronger yarn. The yarn can be dyed and woven into cloth.

History

The silk industry began in China more than 4,500 years ago. The Chinese traded silk but would not tell other countries how it was made. Silk was such an important product that the trade route between China and Europe was called the Silk Road. In the AD 500s silkworms were stolen from China.



Silk cloth is strong and warm but light in weight. It resists wrinkling and can be dyed with bright colors.

Then Europeans started making silk themselves.

Today artificial fibers are often used instead of silk. But people still value silk items because of their quality. China remains a major silk producer.

► More to explore

Clothing • Fibers • Spider

Silverstein, Shel

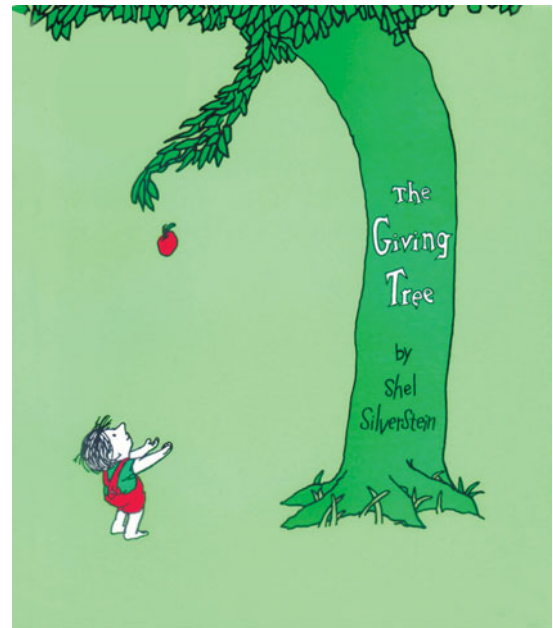
Shel Silverstein's books, including *The Giving Tree* and *Where the Sidewalk Ends*, are some of the most famous children's books of all time. Silverstein also wrote books for adults as well as songs and plays, but he is remembered mostly for his work for children.

Early Life

Sheldon Alan Silverstein was born in Chicago, Illinois, on September 25, 1930. When he was about 12 years old, he became interested in writing and drawing. In the 1950s he served in the U.S. military. During that time, Silverstein worked as a cartoonist for the military magazine *Stars and Stripes*.

Career

Silverstein began writing books for children in the early 1960s. These included *Lafcadio, the Lion Who Shot Back* (1963) and *Who Wants a Cheap Rhinoceros* (1964). *The Giving Tree* (1964) made him famous with children and parents across the country. The book tells the story of a tree that gradually gives a boy everything it has. Other popular Silver-



The Giving Tree is a much-loved book by Shel Silverstein. The story is about the relationship between a boy and a tree. Silverstein also drew the pictures.

stein stories include *The Missing Piece* (1976) and *The Missing Piece Meets the Big O* (1981).

Silverstein also wrote poems. In his serious poems he showed that he understood how children think and what they think about. His humorous verse features comical scenes and fun-to-say words and rhymes. His most famous books of poetry are *Where the Sidewalk Ends* (1974), *A Light in the Attic* (1981), and *Falling Up* (1996).

Silverstein died on May 10, 1999, in Key West, Florida. Some poems he had not yet published appeared in a new book, *Runny Babbit: A Billy Sook*, in 2005.

► More to explore

Cartoon • Literature for Children
• Poetry • Storytelling

Did You Know?

Shel Silverstein was also a musician. He wrote "The Unicorn" and many other songs.

Singapore

Singapore is a small, wealthy island country in Southeast Asia. The capital city, also called Singapore, is so large and important that the country is often called a city-state.

The island of Singapore lies south of the mainland part of Malaysia. A narrow body of water separates the countries. Singapore's land is mostly low and flat. Its weather is hot, humid, and often rainy.

Some rain forests grow in the center of the island. Shrubs and grasses are more common. The animals of Singapore include the long-tailed macaque (a type of monkey) and the slow loris (a tailless primate).

Most people in Singapore are Chinese, Malay, or Indian. The Chinese make up about three quarters of the population. Most of the Chinese are Buddhist, Daoist, or Christian. The Malays and some



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A statue of a merlion serves as a symbol of Singapore. A merlion is an imaginary creature that is half lion and half fish.

Indians follow Islam. Most Indians practice Hinduism. Singapore has four national languages: Malay, English, Chinese, and Tamil (a language of India).

Banking, communications, and other services are very important to the economy. Singapore also produces electronics, chemicals, machinery, petroleum (oil) products, and other goods. There is little space for farming. Singapore buys most of its food from other countries.

In early times traders traveling between India and China often passed through Singapore. The British took control in the 1800s. By 1959 Singapore had its own government. In 1963 Singapore joined Malaysia. Two years later Singapore separated from Malaysia to become fully independent.

► **More to explore**
City-State



Facts About SINGAPORE



Population
(2008 estimate)
4,839,000

Area
269 sq mi (697 sq km)

Capital
Singapore

Form of government
Republic

Sioux

The Sioux are a group of Native American peoples who speak similar languages. There are three main divisions of the Sioux: the Dakota (or Santee), the Nakota (or Yankton), and the Lakota (or Teton).

The Sioux originally lived near Lake Superior in what is now Minnesota. They hunted, fished, farmed, and gathered wild rice and beans.

In the middle of the 1700s wars with the Ojibwa drove the Sioux westward. The Dakota settled in southern and western Minnesota. They kept living as they had before.

The Nakota and the Lakota moved onto the Great Plains. The Nakota settled in what are now North and South Dakota. The Lakota went farther



A photograph from the 1890s shows a Sioux holding a bow and arrows.

west, to the Black Hills region of western South Dakota and eastern Wyoming and Montana. The move changed their lifestyles. The Nakota and the Lakota started hunting bison (buffalo) on the plains. While on the hunt they lived in portable, cone-shaped tents called tepees. They ate bison meat and used bison skins to make tepees and clothes.

By the middle of the 1800s white settlers were moving westward into Sioux territory. The Sioux fought for many years to stop invasions of their land. Sitting Bull and Crazy Horse were famous Sioux chiefs who led the fight. In 1890 U.S. troops killed more than 200 Sioux at a place called Wounded Knee in South Dakota. The massacre ended the Sioux fight against the whites. By the end of the 1800s most Sioux had moved to reservations.

At the end of the 20th century there were about 108,000 Sioux in the United States. Many lived on reservations in Montana, Nebraska, North Dakota, and South Dakota. About 10,000 more Sioux lived in Canada.

► More to explore

Black Hills • Crazy Horse • Native Americans • Sitting Bull • Wounded Knee

Sitting Bull

Sitting Bull was a Native American who tried to keep U.S. settlers from taking over Indian lands. He is known for his role in the battle of the Little Bighorn.



Sitting Bull was a leader of the Sioux people. He was known for his bravery and wisdom.

In that battle he defeated a group of soldiers led by Lieutenant Colonel George Armstrong Custer.

Sitting Bull was a member of the Lakota, or Teton Sioux. He was born in about 1831 near the Grand River in what is now South Dakota. His Sioux name was Tatanka Iyotake. He was named chief of the entire Sioux nation in about 1867.

Sitting Bull spent many years battling U.S. soldiers. Tensions increased when gold was found on Sioux lands. The U.S. government soon ordered the Sioux to move to reservations. Sitting Bull, however, prepared to fight the move. On June 25, 1876, U.S. soldiers led by Custer attacked the Indians. The battle took place in the valley of the Little Bighorn River. When the fighting ended, Custer and all of his soldiers were dead.

Sitting Bull won many more battles. But he and his people were eventually forced to surrender.

Sitting Bull toured for a time with Buffalo Bill's Wild West Show. He later settled on a reservation but remained outspoken. Soldiers arrested him because they were afraid he would stir up trouble. He was killed on December 15, 1890, as his warriors were trying to rescue him.

► More to explore

Sioux

Skateboarding

A skateboard is a small board with wheels on the bottom. A skateboarder stands on the board as it rolls. The skateboarder stays balanced by shifting the



A professional skateboarder wears a helmet and padding while performing a difficult stunt on a closed-off ramp. Skateboarders should stay safe at all times.

Did You Know?

American skateboarder Tony Hawk helped make the sport popular in the 1980s and 1990s.

feet and body. Many young people enjoy skateboarding as a hobby. It is also an organized sport. The best skateboarders can invent and perform difficult tricks.

Most skateboards are about 32 inches (81 centimeters) long and 9 inches (23 centimeters) wide. The back end of a modern skateboard is bent upward. This is called the kicktail. The wheels are made of a special kind of tough plastic.

Skateboarding Styles and Events

The two main styles of sport skateboarding are vertical (or vert, for short) and street style. Vertical skaters jump off ramps or perform in U-shaped riding surfaces called half-pipes. They do tricks in midair. Street-style skaters perform in city environments. They ride their skateboards over objects such as steps, railings, and ledges.

These styles of skateboarding have been organized into competitions. Events are held in Australia, Brazil, Canada, and the United States, and throughout Europe and Asia. Skateboarding is also a part of the televised sports festival called the X Games.

History

The first skateboarders made their own boards in the early 1900s. The simplest homemade skateboards had roller-skate wheels attached to a board.

Skateboarding became popular in the early 1960s. It developed among surfers in California, in the United States. Surf-

ers use special boards to ride on waves in the ocean. When there were no good waves for surfing, some surfers changed their boards. They added wheels so they could ride on the sidewalks near the ocean. Skateboarding was even called sidewalk surfing.

The first skate parks were built in the 1970s. They had slopes and banked surfaces for sudden turns and stunts. But some skateboarders chose to skate in empty swimming pools. This was the beginning of vertical skateboarding. Soon skateboarders started riding in half-pipes. Street-style skating started in the 1980s.

Skating

Skating is a form of sport that has three main types: ice skating, roller skating, and skateboarding. Ice skating is the



Many people enjoy skating as a casual form of entertainment. For others it is a serious sport.

oldest form of skating. Thousands of years ago people used animal bones as skates to cross frozen bodies of water. Modern ice skates are shoes or boots with metal blades attached. Ice skating has three main divisions: figure skating, speed skating, and ice dancing. The team sport of ice hockey also involves skating.

Roller skates have wheels instead of blades. Indoor types of roller skating include roller dancing, figure skating, and speed skating on hardwood, plastic-coated tracks. Roller hockey is usually played outdoors. In the 1980s roller skaters started to use in-line skates, or Rollerblades. They are faster than traditional roller skates.

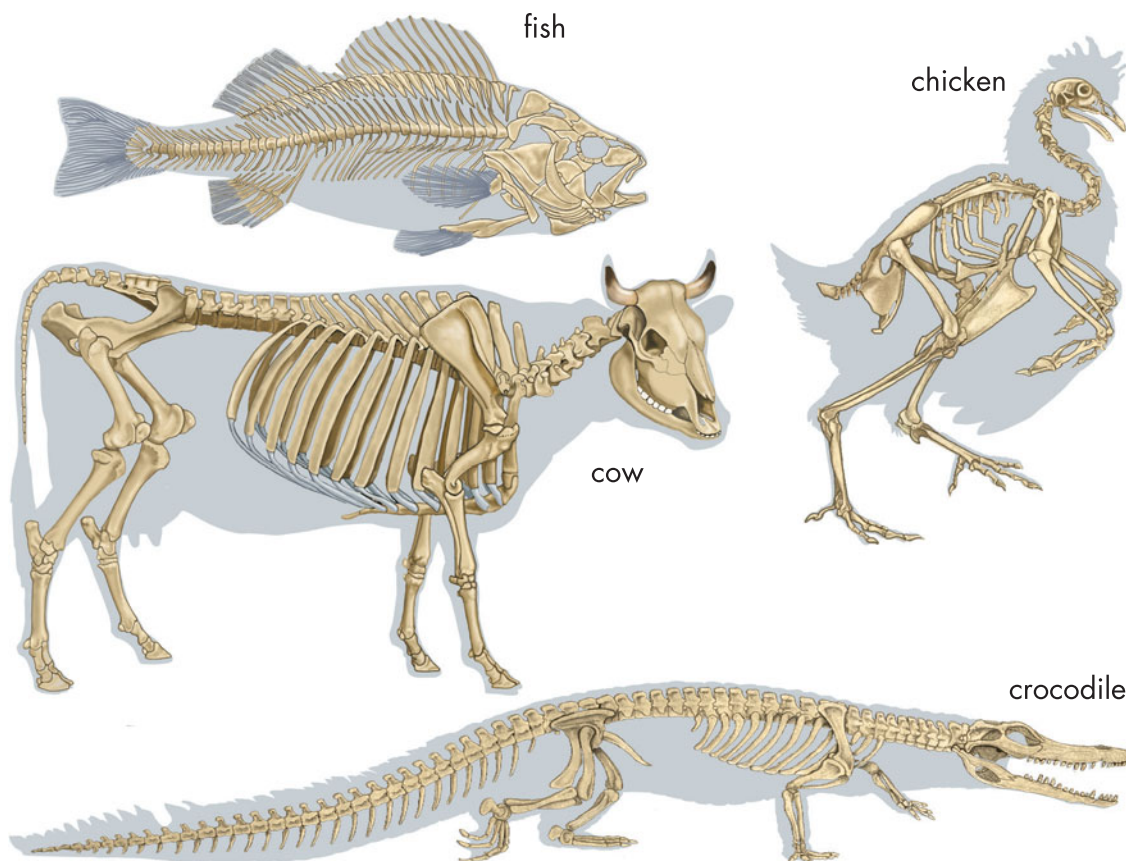
Skateboarding is a popular sport that began in the U.S. state of California in the early 1960s. Young people started skateboarding on pavement near beaches when the ocean was too calm for surfing. A skateboard is like a small surfboard with wheels. Skateboard parks provide a variety of slopes and surfaces for riding.

► More to explore

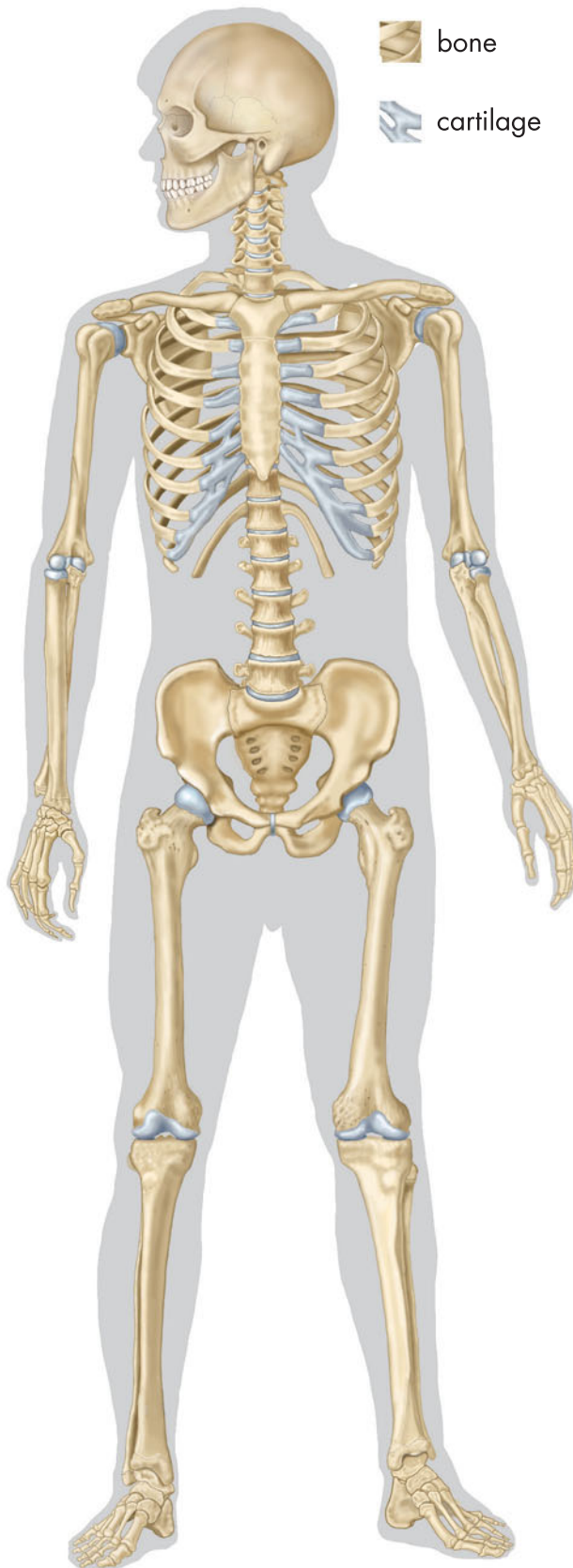
Hockey, Ice • Ice Skating • Roller Skating • Skateboarding

Skeletal System

The collection of bones in an animal's body is called a skeletal system, or skel-



Fish, birds, reptiles, and mammals are four types of animals that have skeletons inside their bodies. The skeletons of a perch, a chicken, a crocodile, and a cow are shown.



The human skeleton is mostly bone but has some cartilage. The skeleton supports and protects the body.

eton. Mammals, birds, reptiles, amphibians, and fish have skeletal systems. Insects and shellfish do not have skeletons inside their bodies. Instead they have hard, outside coverings called exoskeletons. The skeletons of corals and sponges are made of stony minerals, not bone. Some animals, such as jellyfish, have no skeleton at all.

The human skeletal system has more than 200 bones. The hard, stiff bones of the skeleton support the whole body. The skeleton also protects the soft organs inside the body. In addition, the skeleton works with the muscles to allow the body to move.

Support

The most basic job of the skeletal system is support. For example, the spine, or vertebral column, supports the entire upper part of the body. The human spine lets people stand and walk in an upright position, or posture. Humans enjoy great advantages over other animals because of this posture. Because humans use only their legs for walking, their arms are free for useful activities, such as using tools.

Protection

The second major job of the skeletal system is protection. The skeleton's rigid structure protects the body's soft organs. For example, the rib cage formed by the spine and the ribs protects the heart, the lungs, and other organs in the upper body.

The skeletal system also protects the central nervous system, made up of the

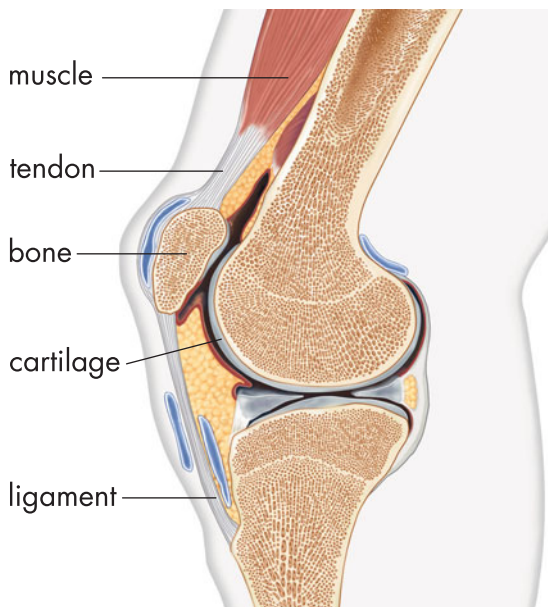
brain and the spinal cord. Inside the head, the skull surrounds and protects the brain. The vertebrae, or bones of the spine, surround and protect the nerves of the spinal cord.

Movement

The third major job of the skeletal system is movement. The skeleton works with the muscles to allow the body to move in many different ways. Many muscles are attached to at least two bones in the skeleton. When the brain tells a muscle to move, the muscle pulls on or pushes its attached bones.

How the Skeletal System Is Connected

Tough, leathery tissues called ligaments hold together the bones of the skeleton. Muscles also hold together some of the bones. In most cases, however, a cord called a tendon connects muscles to bones.



A view of a knee joint shows the different kinds of connective tissue that hold together the human skeleton.

At the points where bones connect, the bones have a protective covering called cartilage. If two hard bones constantly rubbed together without this covering, they would wear down and become damaged. Cartilage is tough enough to protect the bones but elastic enough not to become damaged itself. It is found at the ends of many bones and in joints, such as the knees and the hips. Cartilage also connects parts of the rib cage. The cartilage allows the ribs to move in and out during breathing.

Cartilage can be damaged, however, and it is not easily repaired. As people get older, the cartilage in some joints can wear down. This allows the bones of the joints to rub together painfully. In such cases doctors can replace the joints with artificial joints made of plastic or metal.

► More to explore

Bone • Exoskeleton • Muscle • Nervous System

Skiing

Skiing is a winter sport that involves the use of skis. Skis are long, mostly flat strips of metal, wood, or plastic. Skiers attach them to their shoes or boots and use them to glide over snow, often down a mountain slope. Many people ski for fun. Skiing can be fast and exciting, but it can also be dangerous.

Skiing events are a major feature of the Winter Olympic Games. Four types of skiing events are held at the Olympics:

Did You Know?

An infant's skeleton is made of cartilage that is gradually replaced by bone as the infant grows into an adult.



A skier speeds down a winding course in a type of racing called slalom. Poles called gates mark the course. Skiers are allowed to touch gates with their bodies, as long as their skis stay on the course.

Nordic, Alpine, freestyle, and snowboarding. In the first three types, skiers wear a ski on each foot. The skiers usually hold two poles, which they use to keep their balance or push themselves along. Snowboarders stand with both feet on a single ski, called a snowboard. They do not use poles.

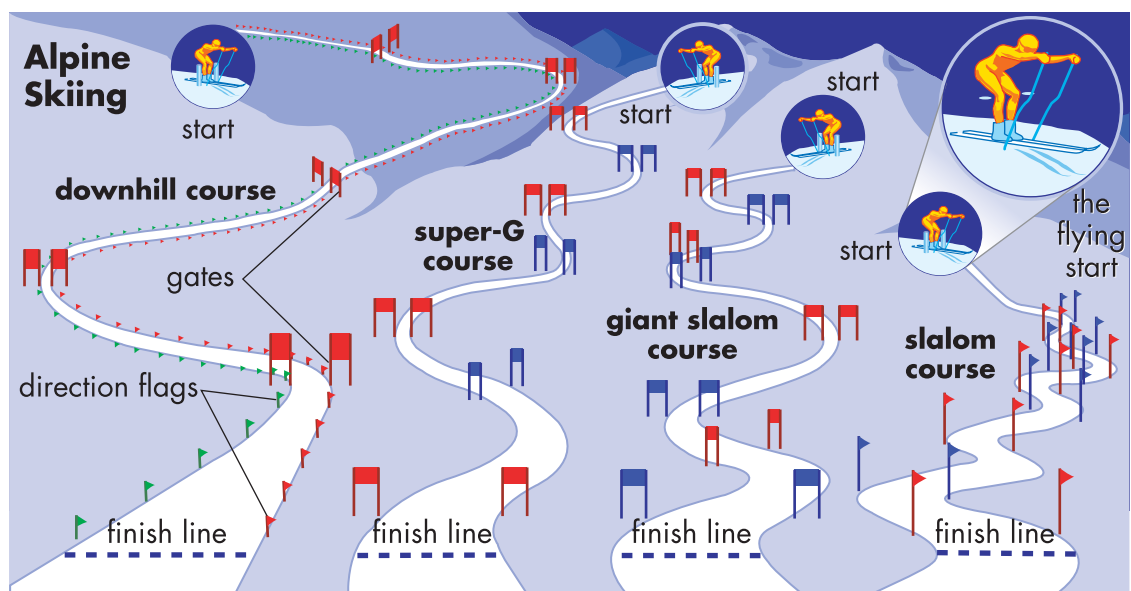
Nordic Skiing

Nordic skiing started in Norway and other countries of northern Europe. Nordic skiing events include cross-country racing and ski jumping. Cross-country skiing takes place on open, hilly land. A cross-country skier must be able to ski uphill, downhill, and across flat areas.

In a ski-jumping competition the skier slides down a steep ramp that curves upward at the end. The skier leaps off the end and tries to “fly” as far as possible and then land on his or her feet. The skier who leaps the farthest and has the best form, or style, is the winner. The event called the Nordic combined includes a ski-jumping contest and a cross-country race.

Alpine Skiing

Alpine skiing started in the Alps mountains of central Europe. Alpine



There are four types of courses for Alpine skiing races. A downhill skier's path, left, is long and steep. A slalom skier, right, faces many tight turns. Giant slalom and super-G, center, combine features of slalom and downhill.

events include downhill and slalom racing. Downhill racing is the fastest and most dangerous of all skiing events. The skier goes down a long, steep course that may have ruts and large bumps. Along the course are gates formed by single poles or pairs of poles. The skier must ski between the gates and stay on the course. The winner is the skier who completes the course in the shortest time.

Slalom racing is similar to downhill racing. However, a slalom course is shorter and more winding than a downhill course. The slalom course requires the skier to make high-speed turns. The giant slalom and the supergiant slalom, or super-G, take place on longer versions of a slalom course.

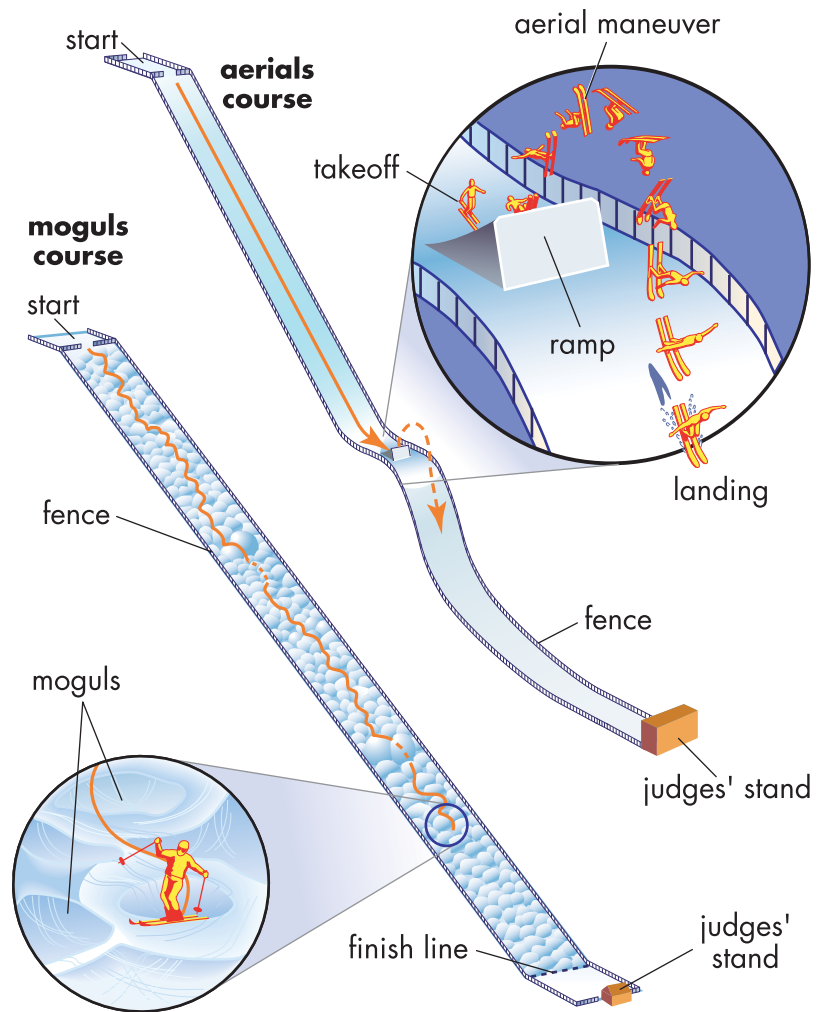
Freestyle Skiing

Freestyle skiing combines skiing and acrobatics. There are three freestyle events: acro, aerials, and moguls. An acro skier performs jumps, flips, and spins while skiing on a gently sloping hill. An aerial skier does similar tricks in the air after jumping off a ramp. A mogul skier races over and around large bumps of snow, called moguls. The mogul skier also makes two jumps and does tricks in the air. In freestyle events judges score the skiers on different skills.

Snowboarding

Snowboarding developed in the United States from the sports of surfing and skateboarding. It is like surfing on snow. A snowboard looks much like a skateboard without wheels.

Freestyle Skiing

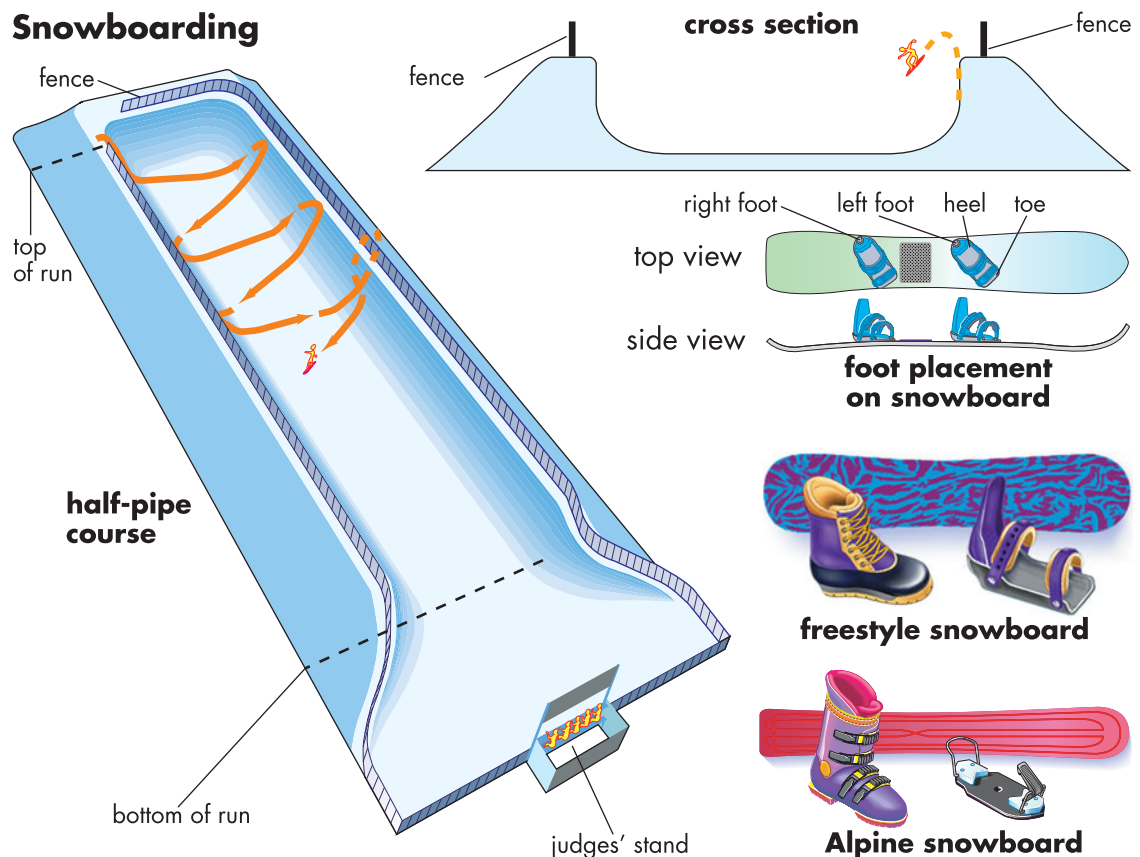


A freestyle skier on a moguls course goes over many bumps. On an aerials course, the skier jumps from a ramp to perform flips and twists in the air.

Snowboarding has slalom, giant slalom, and supergiant slalom (or super-G) competitions. These events are similar to the Alpine slalom events. The snowboarder who completes the course in the shortest time is the winner.

There are also freestyle snowboarding events. They take place on a half-pipe, which is a ramp built from snow. The ramp looks like the lower half of a huge flat-bottomed tube with one open end.

Snowboarding



A snowboarder on a half-pipe course goes back and forth from one side of the half-pipe to the other.

Snowboarders ski from side to side of the ramp, picking up speed. They fly up from the top of the ramp and do tricks in the air. Judges rate the performances.

History

Skis found in Sweden and Finland are thought to be between 4,000 and 5,000 years old. A rock carving of two men on skis, found in Norway, dates from 2000 BC. People in China have skied since at least the AD 600s. Skiing was used in warfare in Norway as early as 1200. Troops in Sweden, Finland, Russia, and Poland also used skis.

Cross-country is the oldest form of sport skiing. Cross-country competitions

began in Norway in the 1840s. By the 1860s skiing had reached the U.S. state of California. Ski-jumping competitions began in the 1870s. Nordic skiing events were a part of the first Winter Olympics, held in 1924.

Alpine skiing developed during the late 1800s and early 1900s. Alpine events became a part of the Olympics in 1936.

Freestyle skiing and snowboarding are newer events. Mogul and aerial skiing were added to the Olympics in the 1990s. Snowboarding events were first held at the 1998 Olympics.

► **More to explore**
Olympic Games

Skin

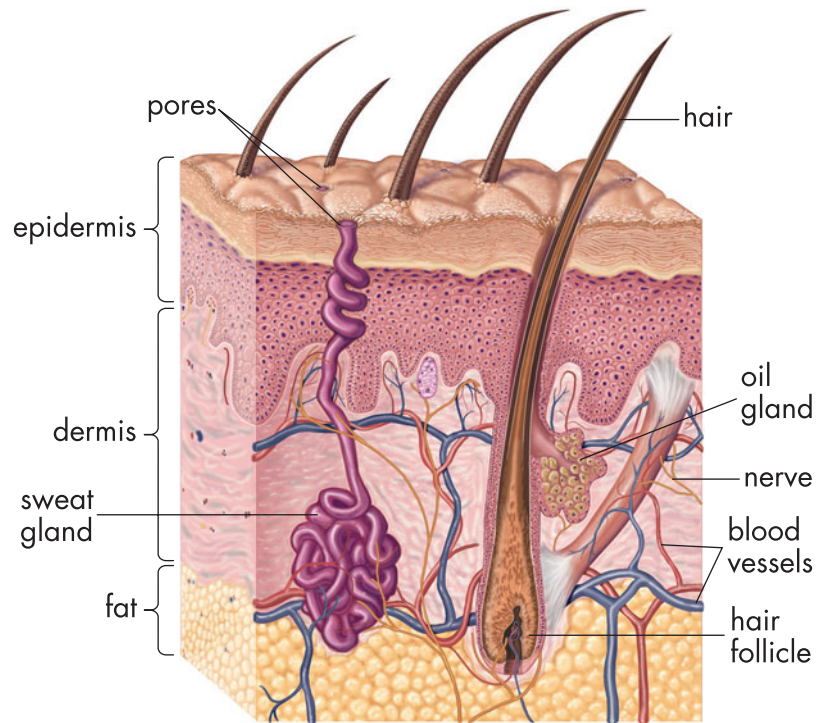
Skin is the outer covering of humans and all other animals with a backbone. It protects the body from germs, injuries, and extremes of hot or cold.

The skin of some animals has special features that provide more protection. Birds, for example, have feathers attached to their skin. Fish and reptiles have plates called scales over their skin. Most mammals have a thick coat of hair called fur. Humans have hair on their skin, too, but not enough to act as protection.

Human skin has three layers. The epidermis is the thin outer layer. Dead cells of the epidermis constantly flake off as new ones form. Cells in the epidermis produce a substance called melanin. Melanin creates different skin colors. The epidermis has cells that make nails, too.

The middle skin layer is called the dermis. It is thicker than the epidermis, which it supports and strengthens. The dermis has fibers that make the skin tough and stretchable. Pits in the dermis, called follicles, make hair. The dermis also contains blood vessels and nerves. Nerves are fibers that send information picked up by the senses to the brain.

The third, deepest layer of the skin is made up mostly of fat. This fat supplies nutrients to the other two layers. It also cushions the body and protects it from the cold.



Human skin has three layers: the epidermis, the dermis, and a layer made mostly of fat. Hair follicles, oil glands, sweat glands, nerves, and blood vessels lie beneath the surface of the skin.

The body releases some substances through the skin. Sweat glands send a watery liquid called sweat through pores, or tiny openings, on the skin's surface. Sweat cools the body. Other glands in the skin produce an oil that can give the skin a slightly greasy surface. This oil helps keep the skin flexible.

Skin can be irritated or damaged in a number of ways. Viruses can cause skin blisters known as shingles. Extra oil production can cause a condition called acne. Skin burns can be caused by fire, chemicals, electric shock, or the sun.

► More to explore

Acne • Burn and Scald • Feather • Hair
• Nail and Claw

Skopje



Population
(2004 estimate)
506,930

Skopje is the capital of Macedonia, a country in southeastern Europe. The city lies on the Vardar River. It is Macedonia's largest city by far.

Skopje is Macedonia's center of business and industry. Factories in the city process foods, cement, metals, and other products. Trade, banking, tourism, and other services are also important.

People called the Illyrians founded Skopje in ancient times. By the 300s the city was the capital of a province of the Roman Empire. In 518 an earthquake destroyed the city, but it was rebuilt. The Serbs conquered Skopje in 1189. The Turkish Ottoman Empire controlled the Macedonia area from 1392 until 1912.

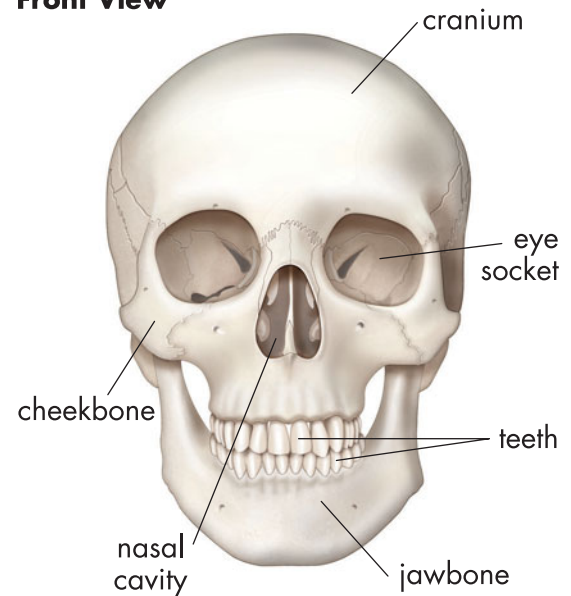
In the early 1900s Skopje and the rest of Macedonia became part of the country of Yugoslavia. In 1963 an earthquake destroyed most of the city. Skopje was rebuilt with many modern buildings. In 1991 Macedonia became an independent country. Skopje was its capital.

► **More to explore**
Macedonia

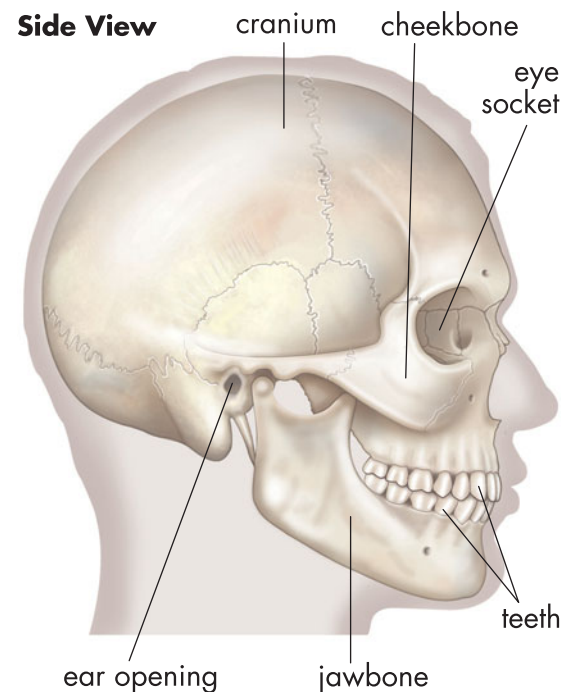
Skull

In animals with a backbone, including human beings, the skull forms the hard part of the head. It surrounds and protects the brain. The skull is a part of the body's skeletal system.

Front View



Side View



The human skull must be large enough to protect a large brain.

The skull is made up of several bones that are joined together like a jigsaw puzzle. Many of the other bones of the body meet at movable joints. The bones of the skull, however, meet at joints that do not move. (The lower jawbone, which does move, is not really a part of the skull.)

The cranium is the part of the skull that covers the brain. The human cranium is noticeably larger than the part of the skull that makes up the face. In most other animals the opposite is true—the face is larger than the cranium.

Openings in the skull let air move through the nose. Other openings form eye sockets that support and protect the eyes. The spinal cord, which is the body's main nerve, enters the skull through an opening at its bottom. Nerves from the eyes, the nose, the ears, and the tongue pass through smaller openings on their way to the brain.

The skull rests on the atlas, which is the topmost vertebra, or bone, of the spine. This allows the skull to nod up and down. The atlas can turn on the vertebra directly beneath it. This allows the skull to turn from side to side.

► More to explore

Bone • Brain • Skeletal System

Skunk

Skunks are black and white mammals known for the foul-smelling spray they release when threatened. When a skunk



The striped skunk is a common skunk of North America.

feels trapped or in danger, it showers this spray on the creature that threatens it.

Skunks are found throughout the Americas. They live in many different places, including woods, grasslands, deserts, and mountains. Many skunks are comfortable in towns and cities.

Skunks are usually the size of a house cat, though some are much smaller. They have a bushy tail. Skunks have different patterns of black and white in their fur. One common pattern is black with a white patch on the head and one or two white stripes on the back. Other skunks have a mostly white back and tail or white spots in black fur.

Most skunks are active at night. They eat insects, eggs, small rodents, birds, and fruits. When a skunk feels threatened, it lifts its tail and stamps its feet. If this does not chase away the enemy, the skunk sprays its smelly liquid. It can shoot this liquid as far as 12 feet (3.7 meters). A skunk usually aims the spray

at the eyes of its enemy. This blinds the enemy temporarily, letting the skunk escape.

► More to explore

Mammal • Weasel

Skyscraper

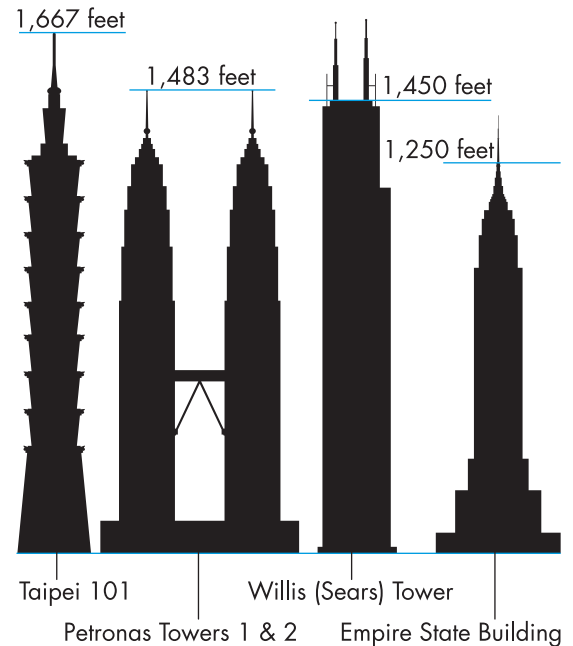
A skyscraper is a very tall building with many stories, or floors. Early skyscrapers had 10 to 20 stories. Today some skyscrapers have 100 stories or more.

Two developments in the middle of the 1800s helped to make the modern skyscraper possible. The first was a process for making large amounts of steel. The second was the invention of the passenger elevator.

Before this time brick or stone walls alone carried the weight of upper stories. The tremendous weight of each story made it impossible to build very high. Some architects (people who design



A cluster of skyscrapers stands near the Singapore River in Singapore.



Four of the world's tallest buildings are shown side by side. The Willis (formerly Sears) Tower and the Empire State Building have antennas that do not count as part of the height. The Taipei 101 is located in Taipei, Taiwan. The Petronas Towers 1 & 2 are found in Kuala Lumpur, Malaysia. The Willis Tower is in Chicago, Illinois, and the Empire State Building is in New York City.

buildings) used an iron frame to support taller buildings. But even these buildings were not much higher than four or five stories.

In the 1860s steel became widely available. This metal is both stronger and lighter than iron. Architects could now use a steel skeleton to support very tall buildings. Chicago's Home Insurance Company Building was the first skyscraper to use this type of steel construction. Built in 1884–85, it was 10 stories high.

Skyscrapers would not have been useful without elevators. People could not

regularly walk up and down more than five or six flights of stairs. In 1853 a U.S. inventor named Elisha Graves Otis introduced an elevator safe enough to carry passengers.

During the 1920s and 1930s skyscrapers rose to greater heights than ever before. For many years the Empire State Building (completed in 1931) in New York City was the world's tallest building. It is 1,250 feet (381 meters) tall and has 102 stories. Today several skyscrapers are even taller.

► More to explore

Architecture • Steel

Slavery

The practice of people owning other people is called slavery. The owned people are called slaves. They have to work for the owners, doing whatever the owners ask them to do. In the past, many societies had slavery. Now almost all societies consider slavery to be wrong. They consider personal freedom to be a basic human right.

The Lives of Slaves

People became slaves in many ways. Some became slaves after being captured in wars or raids. Others became slaves because they had committed crimes or could not pay their debts. Some people were sold into slavery by their relatives. Others were the children of slaves.

Different societies had different rules for slavery. Many slaves of the Muslims, for example, had to be freed after six years.

Slaves in the United States, however, stayed slaves forever. They could not own any property. Their marriages were not legal, and their families could be broken up at any time. There were laws against killing or mistreating slaves, but governments did not always enforce these laws.

Slaves got no pay, had no choice of jobs, and were not allowed to quit. Other kinds of workers had limits on their freedom but were still freer than slaves. Serfs were farmworkers who were legally tied to the land on which they worked. They received no pay and were not free to move away, but they could not be bought or sold like slaves. Indentured servants were people who agreed to work for a master for a certain period of time. People became indentured servants to pay their debts.

Slaves did a variety of jobs. Most slaves worked on farms. Many did cooking, cleaning, child care, and other house-



A monument honors enslaved Africans who died in 1830. Their ship sank off the coast of Martinique, an island in the West Indies.

hold services for the families that owned them. Others worked to make money for their owners. Some slaves worked in mines.

Early Slavery

Slavery existed throughout the ancient world. It was practiced in China before 1200 BC. There were laws about slaves in the Middle East from about 1750 BC and in India from about 100 BC.

In Athens, a city of ancient Greece, about one third of the people were slaves. In ancient Rome, slaves worked on farms, rowed warships, did construction work, or copied out books. In the later days of the Roman Empire, slaves on farms eventually became serfs.

In the early Middle Ages, after about AD 500, Europeans took many Slavs (a people of eastern Europe) as slaves. The word slave comes from “Slav.” Serfs slowly replaced slaves in all of Europe. There were serfs in parts of Europe into the 1800s.

Enslaved Africans

Slavery also existed in Africa in ancient times. But the African slave trade across the Atlantic Ocean began in the early

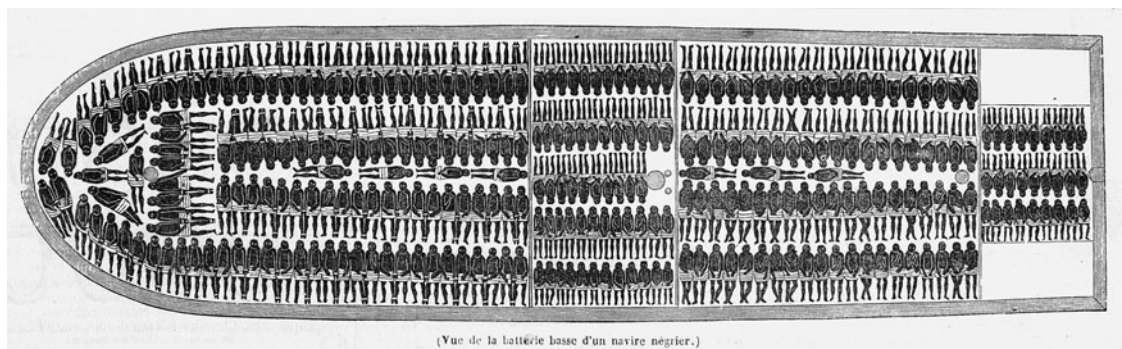
1500s. European ship captains bought slaves from African traders. The ships then usually carried the slaves to Brazil or a Caribbean island. Conditions on slave ships were terrible, and many people died.

Those who survived were sold to owners in many parts of the Americas. Owners put Africans to work in mines or on large farms that grew tobacco or sugar. The farms needed African slaves to replace Native American workers. European diseases had nearly wiped out these Native Americans.

The first African slaves in North America arrived in the English colony of Virginia in 1619. All the British colonies permitted slavery, but the large farms that used the most slaves were in the South. At first, tobacco was the most important crop. Then, in 1793, Eli Whitney invented a machine called the cotton gin. His invention made cotton easier to process. This led to a huge demand for African slaves to work on large cotton farms called plantations.

Ending Slavery

During the 1700s some people in Great Britain came to think that slavery was



Enslaved Africans had no room to move on a ship that took them across the Atlantic Ocean.

wrong. They began the abolitionist movement, an effort to end slavery. Both Britain and the United States banned the slave trade in the early 1800s. Starting with Vermont in 1777, the northern parts of the United States banned slavery entirely.

However, the large Southern plantations continued to rely on slave labor. Some slaves escaped through a secret organization called the Underground Railroad, but the system of slavery survived. In some states more than half the people were slaves.

The big issue that divided the United States was whether slavery would be allowed in new territories and states. The Missouri Compromise of 1820 settled the problem for a time. It allowed slavery in some new territories but not others. However, the Kansas-Nebraska Act of 1854 allowed the people in new territories to choose to have slavery. In the Dred Scott case of 1857, the U.S. Supreme Court ruled that the government did not have the power to ban slavery in the territories. In 1861 the American Civil War began, partly over the issue of slavery. At the end of the war, the 13th Amendment to the Constitution finally put an end to slavery in the United States.

In Central and South America, as soon as colonies gained independence, they often banned slavery. The last country in the Western Hemisphere to end slavery was Brazil, in 1888.



Small houses on the grounds of a Southern plantation were once the homes of slaves.

By the late 1800s the British abolished slavery in India and in the parts of Africa that they controlled. Slavery ended in China in 1910.

Some parts of Africa and the Islamic world practiced slavery well into the 1900s. Although all countries had officially outlawed slavery by the end of the 1900s, the practice continued in some parts of Africa and Asia.

► More to explore

Abolitionist Movement • American Civil War • Dred Scott Decision • Human Rights • Kansas-Nebraska Act • Missouri Compromise • Underground Railroad

Sleep

Many animals, including humans, sleep. When people sleep, their eyes are closed, their muscles are relaxed, and they are usually lying down. Getting enough sleep is an important part of being healthy.

Did You Know?

Most dreams occur during a part of sleep when there are rapid eye movements (REMs). People usually have three to five periods of REM sleep per night.

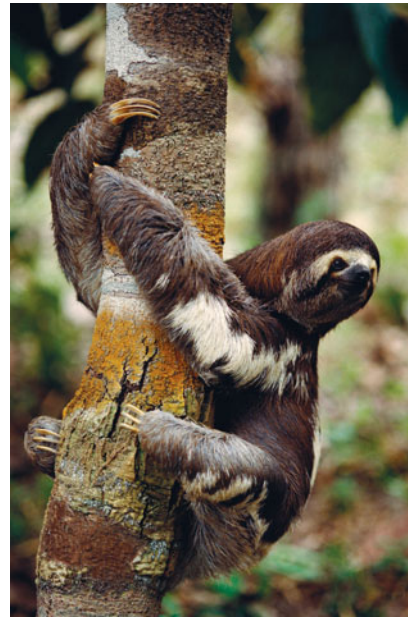
Scientists are not sure exactly why people and other animals sleep. Some scientists think that sleep is a way for animals to save energy, because the body uses less energy when asleep than when awake. Other scientists think that sleep allows the body and mind to rest and recover from the day's activities. People who do not get enough sleep may have difficulty remembering and concentrating.

People need different amounts of sleep at different times in their lives. A new baby may sleep for as many as 16 hours a day by taking frequent naps. A 2-year-old child usually naps during the day and sleeps for a longer period through the night. As children grow into adults, they usually stop taking regular naps and sleep for a single, long period each night. The average amount of sleep for an adult ranges from six to nine hours each night. Elderly people may nap often during the day and sleep only a few hours at night.

Sloth

Sloths are slow-moving mammals that spend most of their lives in trees. They cling to the trunks or hang upside down from the branches. Sloths live in the tropical forests of Central and South America. They are related to armadillos and anteaters.

Sloths can grow up to 27 inches (69 centimeters) long. They have thick skin and either a short, stumpy tail or no tail at all. The fur is usually grayish brown or tan. Sloths often have a greenish tint



A three-toed sloth clings to a tree trunk.

because of algae on their fur. The algae protects sloths from other animals by helping them to blend in with tree leaves.

Sloths have either two or three toes on their feet. The toes have long, curved claws, which the sloth uses to grasp branches. Two-toed sloths spend much of the time hanging onto trees with all four legs. Three-toed sloths often sit on the branches rather than hang from them.

Sloths are quiet animals that live alone. They sleep most of the day. Sloths sleep hanging upside down, with the head tucked up between the front legs. At night they move very slowly through the trees eating leaves and fruit. Sloths rarely come down from the trees because they cannot walk.

► More to explore

Anteater • Armadillo • Mammal

Slovakia

Slovakia is a small country in central Europe. From 1918 to 1992 Slovakia was part of the country of Czechoslovakia. Slovakia's capital is Bratislava.

Slovakia shares borders with the Czech Republic, Poland, Ukraine, Hungary, and Austria. The Carpathian Mountains run across northern Slovakia. Lower mountains rise in the center. Slovakia has cool summers and cold winters.

Forests cover nearly half of Slovakia. Alpine grass and shrubs grow in the highest areas. Bears, wolves, lynx, wildcats, otters, and mink live in the mountains. Slovakia's many birds include wild geese and herons.

Slovaks make up most of the population. The rest of the people are mainly Hungarians. Slovak is the main language. Roman Catholicism is the most common religion.



The oldest parts of Orava Castle in Slovakia are more than 700 years old.

Banking, tourism, and other services are large parts of Slovakia's economy. Manufacturing and mining are also important. Factories produce metals, machinery, flour, fuels, paper, and other goods. Mines provide iron and coal. The main crops grown in Slovakia are wheat, sugar beets, and corn.

Tribes of people called Slavs settled Slovakia's land in the 500s or 600s. Hungary later conquered the region. In 1526 the Hapsburg Empire of Austria took over Hungary and Slovakia. After 1867 Slovakia was a part of the Austro-Hungarian Empire. In 1918 Slovakia joined a new country called Czechoslovakia.

In 1989 the people of Slovakia voted to separate from Czechoslovakia. Slovakia became an independent country on January 1, 1993. In 2004 Slovakia joined the European Union.

► **More to explore**
Bratislava • Czechoslovakia



Facts About SLOVAKIA



Population
(2008 estimate)
5,401,000

Area
18,933 sq mi
(49,035 sq km)

Capital
Bratislava

Form of government
Republic

Major cities
Bratislava,
Košice, Prešov,
Nitra, Žilina,
Banská Bystrica



Slovenia

Slovenia is a country in the Balkans, a region of southeastern Europe. The capital is Ljubljana.

Slovenia shares borders with Italy, Austria, Hungary, and Croatia. In the southwest Slovenia has a short coastline on the Adriatic Sea.

Parts of the Alps mountains stretch across northern Slovenia. The Sava and Drava rivers flow down through the east. In the southwest is the Karst, a rocky region with many caves. Most of Slovenia has cool or warm summers and cold winters.

Slovenia's many forests include juniper, birch, and beech trees in the hilly areas. Shrubs grow in the lower areas. Brown bears, wolves, lynx, wild boars, and deer live in Slovenia.

Most of Slovenia's people are Slovenes. Their language is also called Slovene.



A town sits in a valley near the Alps mountains in northern Slovenia.

Most of the Slovenes are Roman Catholics. Small groups of Serbs, Croats, Bosniacs (Muslims), and others also live in Slovenia.

Manufacturing is important to the economy. Slovenia produces iron and steel, electronics, cloth, chemicals, wood products, and motor vehicles. Banking and other services are also important.

Slavic people, the ancestors of the Slovenes, settled in the region in the 500s. Over the centuries different powers ruled the Slovenes. In 1918 Slovenia joined the new Kingdom of Serbs, Croats, and Slovenes. The country was renamed Yugoslavia in 1929. Slovenia broke away from Yugoslavia in 1991. In 2004 Slovenia joined the European Union.

► More to explore

Balkan Peninsula • Communism
• Ljubljana • Yugoslavia

Facts About SLOVENIA



Population
(2008 estimate)
2,029,000

Area
7,827 sq mi
(20,273 sq km)

Capital
Ljubljana

Form of government
Republic

Major cities
Ljubljana, Maribor, Celje, Kranj, Velenje



Smallpox

Smallpox is a dangerous disease caused by a tiny germ called a virus. Smallpox once killed or scarred many people. However, in the late 20th century scientists fought the disease successfully. There have been no naturally occurring cases of smallpox since the 1970s.

People who have the smallpox virus can spread it to other people through their breath or saliva. The virus also can live on bedding or clothing. Once a person is infected by the smallpox virus, there is no cure for the disease.

People with smallpox get a high fever. They also get body aches and become very tired. A rash appears on the skin. The rash changes into blisters. People can die from smallpox. People who survive may suffer permanent damage such as scars or blindness.

Smallpox existed for thousands of years in Europe, Asia, and Africa. Explorers brought the disease to the Americas after 1492. Many Native Americans died from it. Large outbreaks of smallpox happened around the world.

In 1796 an English doctor named Edward Jenner discovered a smallpox vaccine. A vaccine is a substance that prevents people from getting a disease. In 1967 a group called the World Health Organization began giving the smallpox vaccine to people around the world. The project was a success. By



A doctor gives a girl a shot of a vaccine in the 1960s to protect her against smallpox. Doctors vaccinated so many people that today the chances of catching the disease are very small.

1979 there were no cases of smallpox anywhere in the world.

► More to explore

Disease, Human • Vaccine • Virus

Snail and Slug

Snails and slugs are similar animals. The main difference between them is that a snail has a shell and a slug does not. Snails and slugs belong to the group of soft-bodied animals called mollusks, which also includes oysters, clams, and squid.

Snails and slugs are found throughout the world. Some live on land or in trees. Others live in water. Some snails and slugs spend the winter underground.

Most snails and slugs are small and drab. A snail has a coiled body and shell. The shell protects the snail from heat and enemies. Snails can make their shells



A snail glides along the surface of a leaf.

bigger as they grow. Slugs have straight bodies. Both snails and slugs have two long tentacles sticking out from the head. Each tentacle has an eye at the tip.

Snails and slugs move by gliding on a foot. They make a slimy fluid that helps the foot glide.

Snails and slugs eat plants. Slugs also eat dead animal material and sometimes worms and snails. Snails and slugs are eaten by snakes, toads, turtles, beetles, and birds.

Gardeners consider snails and slugs to be pests. But people eat some types of land snails, especially in France.

► More to explore

Mollusk • Shell

Snake

A snake is a reptile with a long, slender body but no arms or legs. Snakes are closely related to lizards. There are about 2,900 species, or kinds, of snake. The

best-known snakes include cobras, vipers, boas, and pythons.

Where Snakes Live

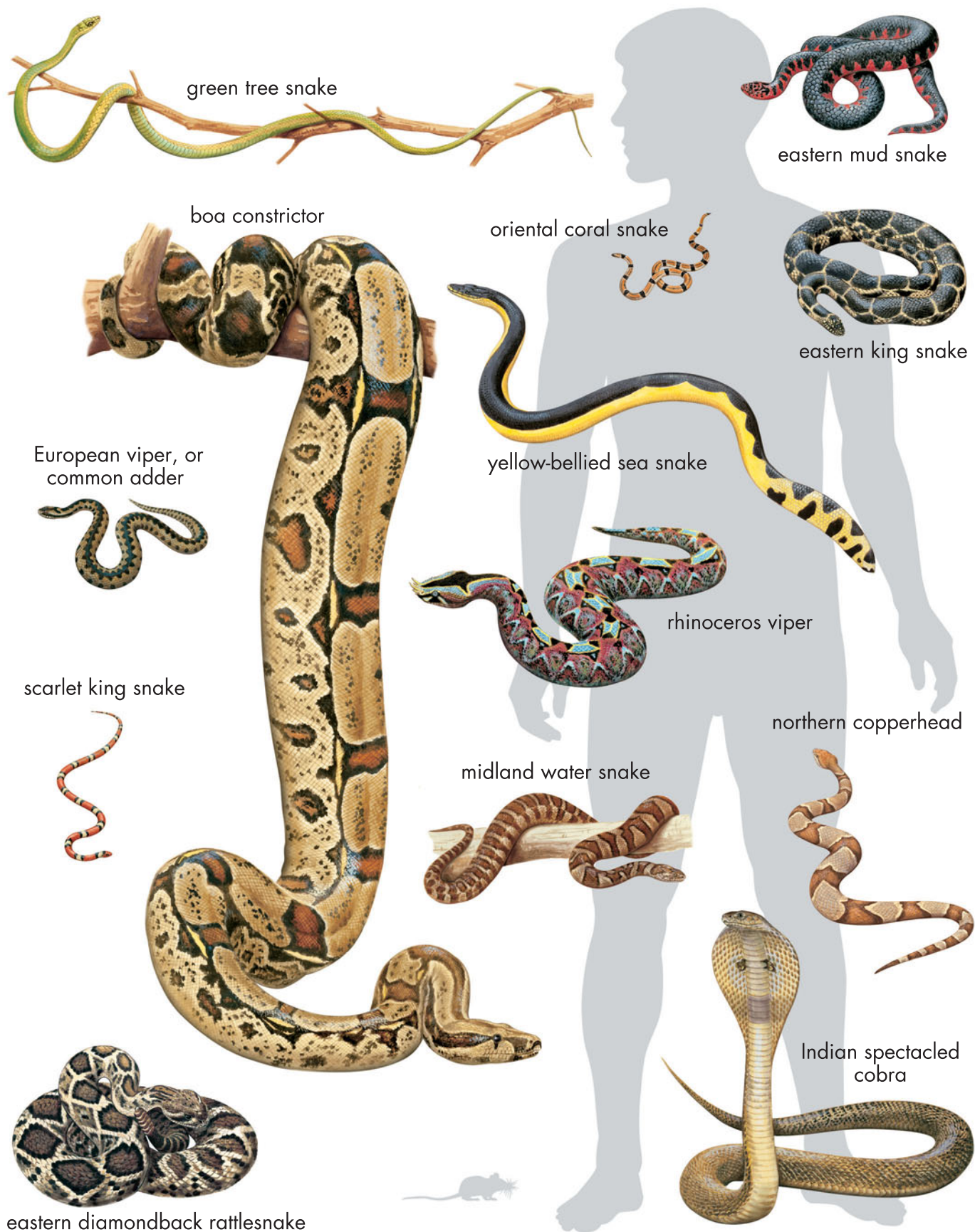
Snakes are found throughout the world except near the North and South poles. The tropics have the greatest variety. Most snakes live on the ground, but others prefer trees. Some snakes spend their whole lives in underground tunnels. Sea snakes live in water.

Physical Features

Snakes are vertebrates, or animals with a backbone. The backbone is long and flexible. Snakes grow throughout their lives. The longest known snake is the reticulated python, which can grow to 32 feet (10 meters). The giant anaconda is usually not as long but is much heavier. The smallest snakes are the blind snakes. Some of them are barely 4 inches (10 centimeters) long.

Snakes are covered with rows of scales. Scales are hardened folds in the outer layer of skin. A scale can be shiny and smooth, or it can have a ridge running down the middle. A snake molts, or sheds its skin, many times during its life.

Snakes have no ears or eyelids. Clear scales cover the eyes. A snake's mouth opens wide because the lower and upper jaw can separate. Most snakes have long, needle-sharp teeth that curve backward. Some snakes, including cobras and rattlesnakes, have a long front or back pair of teeth called fangs. A snake's tongue is forked.



Snakes come in many different sizes and colors.

Behavior

Snakes eat mice, rats, birds, frogs, fish, insects, lizards, eggs, and sometimes other snakes. Most snakes swallow their prey whole, usually head first. The prey may be dead or alive when eaten. Boas, pythons, king snakes, and rat snakes are called constrictors. They coil around their prey and constrict, or squeeze, the animal to death before eating it. Vipers and cobras kill their prey by shooting venom, or poison, into it through their fangs.

Without ears, snakes cannot hear most sounds. But they can sense when prey is near through vibrations in the ground. Snakes can see very well, too. Snakes flick out their tongue to “taste” the air, which gives them information about their surroundings. Snakes do not have vocal cords. This means that they are voiceless. However, they can make a hissing sound by sending air through an opening in the mouth.



A black-and-yellow mangrove snake sticks out its forked tongue. A snake uses its tongue to gather information about its surroundings.

A snake's color can help protect it from enemies. Some snakes blend in with their surroundings. For example, many tree snakes are bright green and resemble vines. The bright colors of some snakes warn attackers that they are poisonous.

Snakes are cold-blooded animals. This means that their body temperature changes along with the temperature of their surroundings. To survive cold seasons, some snakes go into hiding places and become inactive for months at a time. This is like hibernation in mammals.

Movement

Most snakes move by pushing the scales on the underside of their body against the ground. The body moves in a series of S-shaped loops. Some large snakes, such as the boas, move in a straight line. They inch their body forward like a caterpillar does. Other snakes move by folding and unfolding like an accordion. Many desert snakes use a movement called sidewinding. They throw their body upward and sideways across the sand.

Life Cycle

Most snakes live alone for most of the year. Some kinds gather for mating or hibernation. Most snakes lay eggs, but others give birth to live young. The number of young varies from about 3 to more than 50. At birth, baby snakes look like adult snakes. Snakes kept by people can live more than 30 years. Snakes in the wild do not live as long.



A green mamba hatches from its egg. Baby snakes look like small adult snakes.

Snakes and Humans

Some people think snakes are scary and dangerous. However, a snake bites a human only when it is frightened or threatened. Plus, snakes eat rats and mice, which most people consider to be pests. People hunt snakes as a source of clothing and food. Some snakes are captured and sold as pets.

► More to explore

Anaconda • Boa Constrictor • Cobra
• Lizard • Python • Rattlesnake • Reptile
• Sea Snake • Viper

Snow

Tiny crystals of ice that fall to Earth are called snow. A crystal is a solid substance that has flat surfaces and sharp corners. Snowfall is made up of both single ice crystals and clumps of ice crystals. The clumps are called snowflakes.

How Snow Forms

Snow is formed high in the clouds from water vapor, which is water in the form of gas. If a cloud is cold enough, the water vapor freezes to form ice crystals. At temperatures between about -40°F (-40°C) and 32°F (0°C), water vapor crystallizes around bits of dust in the cloud. At lower temperatures, water vapor freezes directly into ice crystals.

The ice crystals can stay up in the clouds. Or, if they are heavy enough, they can fall to the ground. As they fall they can clump together with other ice crystals to form snowflakes. One snowflake can contain as many as 100 ice crystals. But some single ice crystals fall as snow, too.

Snowflake Shapes

The way that ice crystals join together gives every snowflake a unique design. Even so, most snowflakes have six points or six sides. They form seven basic shapes: stars, needles, dendrites (having branches), plates, columns,



A layer of snow covers the ground in a mountainous region. Like rain, snow is made of water. But the water in snow is frozen into crystals of ice.

columns capped with plates, and irregular (damaged). What shape a snowflake takes depends on the temperature and the amount of moisture in the cloud.

Where Snow Falls

Snow falls in many places that get cold weather, mainly during winter. In areas near the North and South poles, snow covers Earth year-round. Near the equator, snow falls only in the highest mountain regions.

Effects of Snow

Snow greatly affects climates and living things. A cover of snow on the ground helps to keep the air cold. This happens because snow reflects, or bounces back, most of the sun's heat. However, a snow cover can also protect small plants from the effects of severe cold. When snow melts in the spring, it provides freshwater for people and animals. But if snow

does not melt for years, it may form huge slabs of ice, called glaciers.

► More to explore

Climate • Cloud • Crystal • Glacier
• Water

Soccer

Soccer is the world's most popular team sport. In most parts of the world the game is called football or association football. Both men and women play soccer in schools, clubs, and on national and professional teams. In a soccer game two teams compete to score more points, which are called goals. The players move the ball around a rectangular field, usually by kicking it. A team scores when it sends the ball into the opposing team's goal.

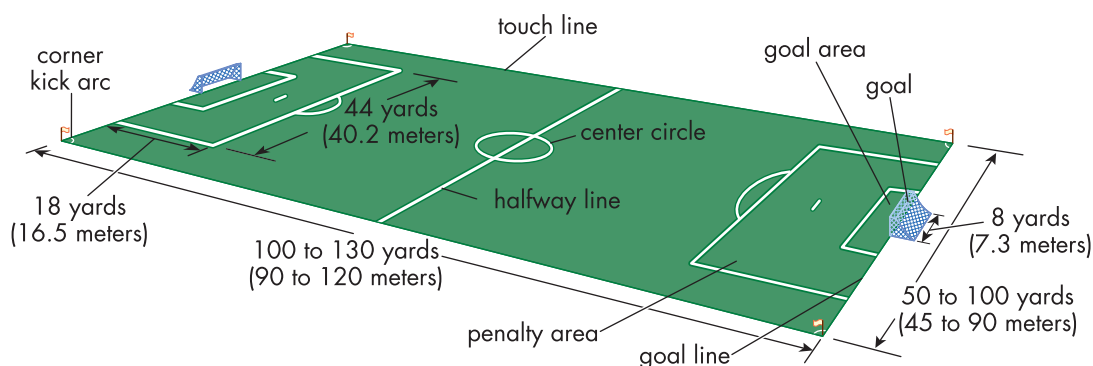
The World Cup soccer tournament is the world's most popular sports event. Every four years teams from many countries compete for the World Cup.

Playing Area and Equipment

Soccer fields vary in size. A field should be 100 to 130 yards (90 to 120 meters) long and 50 to 100 yards (45 to 90 meters) wide. Boundary lines called touchlines mark the sides of the field. Goal lines mark the ends of the field. A goal is located at each end of the field. The goal is a frame that is 8 yards (7.3 meters) wide and 8 feet (2.4 meters) high. It has a net on the top, sides, and back. A soccer ball is round and filled with air.



Snow piles up against a window in Norway. The crystal structure of snow can be seen in the small clumps of flakes.



Soccer fields can vary in overall length and width. But penalty areas, goal areas, and goals always are the same sizes.

Playing the Game

Soccer teams are made up of 11 players each. Each team tries to control the ball and move it toward the opponent's goal. Only one player on each team, the goalkeeper, can touch the ball with the hands and arms. The rest of the players can touch the ball with any part of the body except the hands and arms. They usually move the ball with their feet.

Roles of the Players

During a soccer game the players of each team spread across the field in loose formations. A formation generally has front, back, and middle sections.

The front section is the offensive, or scoring, part of the team. The main offensive players are called forwards, or strikers. When a team has the ball, the forwards try to score goals. A team's forwards are usually located closest to the opponent's goal.

The back section is mostly defensive—it protects the team's goal. Each team has a goalkeeper in front of its goal. Goalkeepers try to deflect or catch the opponent's shots at the goal. Players called

defenders form a defensive screen between their goalkeeper and the opposing team. Defenders try to take the ball from the other team.

The players in the middle section play both offense and defense. Midfielders generally are located between their team's forwards and defenders.

Playing Skills

Soccer players move the ball by either dribbling, kicking, or heading it. A player dribbles by using very short kicks to move the ball forward. Dribbling allows a player to keep control of the ball while running down the field. Players use longer kicks to pass the ball to teammates or to try to make a goal. Striking the ball with the head is called heading. Players often head the ball when receiving long, high passes. Sometimes they also try to head the ball into the goal.

When one player has the ball, players on the opposing team try to take the ball away from that player. This is called tackling. In one type of tackle a player uses the feet to kick or steal the ball

away from an opponent. Another way to get the ball is to intercept a pass. A player intercepts a pass by stealing the ball during a pass between two opponents.

Fouls

Three officials—a referee and two assistants—control the game. They give teams penalties when players commit fouls, or break the rules. After some fouls the officials award free kicks to the other team. When a free kick is taken, all players of the offending team must be at least 10 yards (9 meters) from the ball. The officials award penalty kicks for more serious fouls. A penalty kick is a free kick at the offending team's goal. It is taken from a spot 12 yards (11 meters) from the goal. All players other than the defending goalkeeper and the kicker must stand aside.

History

Games like soccer were played in China more than 2,000 years ago. Similar games were also played in ancient Greece, Rome, Japan, and Mexico. But



Portugal's goalkeeper fails to stop France from scoring a goal on a penalty kick during the 2006 World Cup.



Mia Hamm of the United States drives to the goal in a game against Brazil in 1999. Later that year Hamm led the U.S. team to a women's World Cup championship.

the modern game of soccer started in England. In 1863 several English soccer teams formed the Football Association (FA). It created the first standard set of rules for the game.

The FA was an amateur organization, which means that its players were not paid. Professional soccer leagues, in which players were paid, began in the late 1880s. They formed first in England and then in other countries. By 1900 people were playing soccer throughout the world.

In 1904 the Fédération Internationale de Football Association (FIFA) was formed. FIFA governs the game at the international level. In 1930 FIFA organized the first World Cup tournament.

The first women's World Cup was held in 1991.

Soccer became an official event at the Olympic Games in 1908. It was the first team sport to be included in the Olympics. Women's soccer became an Olympic event in 1996.

Soccer is not as popular in the United States as it is in other parts of the world. In the 1990s, however, it began to grow in popularity. In 1994 the United States hosted the World Cup. Two years later a professional league—Major League Soccer—was formed. The United States also hosted the Women's World Cup in 1999, and the U.S. team won that championship. In addition, many young people in the United States enjoy playing the game.

Socialism

Socialism is a way to organize a society. It deals mostly with the economy, or the part of a society that creates wealth. The goal of socialism is to spread wealth more evenly and to treat all people fairly. People have had different ideas about how to create a socialist society. But most have agreed that the government, not individuals, should control at least some businesses and property.

Beginnings of Socialism

Socialism began as a reaction to the system called capitalism. In capitalism, individuals own property, and people and companies compete with one another for wealth. Capitalism grew

strong during the Industrial Revolution. This was a time in the 1700s and 1800s when many machines were invented and factories were built. The owners of the factories grew wealthy. But the workers worked very hard for little money. Plus, they were often mistreated.

To create a fairer society, some people wanted the government to control industry. The government could then use its economic power to create a comfortable life for everyone. This new system was socialism. Socialists believed that the ownership of factories and other property would gradually pass from a few wealthy people to the workers.

Some socialists did not want to wait for gradual change. Instead, they wanted workers to overthrow the capitalist system. A German scholar named Karl Marx believed that workers eventually



In 1910 Charles Edward Russell, an American journalist and writer, ran for the governor of New York as a socialist.

would create an extreme socialist system known as Communism. In a true Communist society, there would be no private property or government. People would produce and share goods and other wealth based on their different abilities and needs.

Socialist Governments

The Russians set up the first Communist government. They formed a new country, called the Soviet Union, in 1922. In the 1940s many countries of eastern Europe also became Communist. After World War II (1939–45) Communists took control of China, North Korea, Vietnam, and Cuba. Many African countries also turned to Communism.

After the war Great Britain, France, Italy, and Germany adopted some socialist ideas, too. Their governments took control of some businesses. They also set up programs to provide money, health care, and other services to citizens who

needed them. Even some countries that rejected socialism—such as the United States—set up social service programs.

End of Extreme Socialism

By the end of the 1900s extreme socialism had failed to live up to its promise. Communist countries tended to have harsh governments. Their citizens were also much poorer than those in capitalist countries. The Communist governments in the Soviet Union and eastern Europe collapsed in the 1990s. China remained Communist but began to allow private business ownership.

Some governments in Europe, Latin America, and elsewhere continued to follow socialist ideas. However, they also supported capitalism.

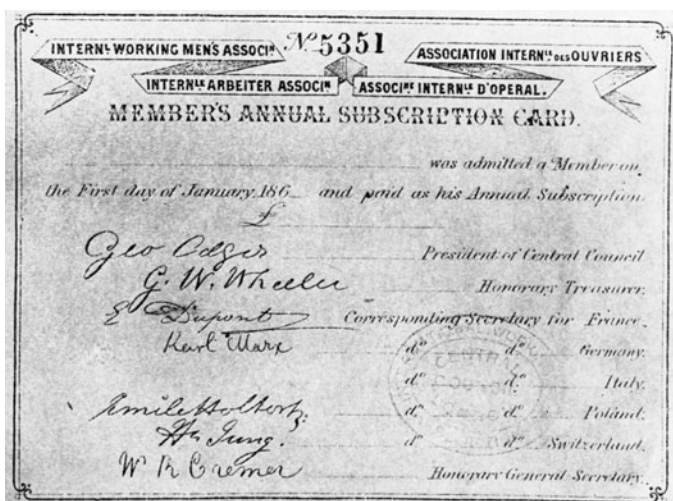
► More to explore

Capitalism • Communism

Social Science

The social sciences are fields of study about human life and behavior. The social sciences are also known as social studies or behavioral sciences. People who study social sciences look at how people think and act. They also study how people form groups and relate to other people.

The main social sciences are anthropology, economics, political science, psychology, and sociology. Anthropology is the study of humans and their cultures throughout history. Economics is the study of how people make wealth and spread it around. Political science is the



A membership card from the socialist organization called the International Working Men's Association shows the signature of Karl Marx, who was active in the group.



Social scientists study many types of groups of people, including the family.

study of governments. Psychology is the study of the human mind and human behavior. Sociology is the study of society, or the different groups that people form.

Some people consider other subjects to be social sciences, too. These subjects include communications, education, geography, history, and law.

► More to explore

Anthropology • Economics
• Government • Psychology • Sociology

Society of Friends

► see Quakers.

Sociology

Sociology is the scientific study of human societies, or groups. Scientists in

this field are called sociologists. Sociology is one of the social sciences. The social sciences deal with human life and behavior. They also include psychology and anthropology.

Humans are naturally social beings. This means that they form groups and enjoy relating to others. But the rules and pressures of groups deeply influence people. A group can cause people to act differently than they might act outside the group.

Sociologists study the influence of groups on human behavior. They study how humans behave in small groups, such as families and schools. They study how humans behave in larger societies, such as cities and countries. Sociologists also examine how societies develop and change.

The work of sociologists helps to explain the causes of poverty, crime, and other problems in society. This information is helpful to lawmakers, business leaders,



Games played in the schoolyard can show sociologists how children in a society act with one another.

educators, and others working to improve human life.

► More to explore

Anthropology • Psychology • Social Science

Sofia



Population
(2008 estimate)
1,240,790

Sofia is the capital of Bulgaria, a country in southeastern Europe. It is Bulgaria's largest city. Sofia was named after Saint Sofia Church, which was built in the city in about the 500s.

Many people in Sofia work for the government or in tourism or other service industries. The city is Bulgaria's main center of industry and trade. Factories in Sofia process foods and metals and make electronics, machinery, and cloth. Engineering is also a leading industry.

Sofia is an ancient city. People called the Thracians settled in the Sofia area more than 2,700 years ago. About 700 years after that the Romans conquered the city. The city later became part of the Byzantine Empire.

The Bulgarians made Sofia part of their state in AD 809. The Turkish Ottoman



The Alexander Nevsky Cathedral is an Eastern Orthodox church in Sofia, Bulgaria. It was built in the early 1900s.

Empire controlled the city from the late 1300s to the late 1800s. Sofia has been the capital of Bulgaria since 1879.

► More to explore

Bulgaria

Softball

Softball is a sport that has rules similar to those of baseball. However, softball has a smaller field and a larger, softer ball. Also, a softball pitcher throws the ball with an underhand motion. Both men and women play softball.

Playing Area and Equipment

A softball field is shaped like a triangle with one rounded side. This is the same shape as a baseball field. The field is divided into an infield and an outfield. Four bases lie inside the infield. The

bases are called home plate, first base, second base, and third base. They mark the corners of a square area called the diamond. The sides of the diamond are about 60 feet (18.3 meters) long. A pitcher's mound rises in the middle of the diamond. The outfield lies beyond the infield.

A softball is about 12 inches (30.5 centimeters) around. The players wear webbed gloves to catch the ball. To hit the ball, they use a rounded bat.

Playing the Game

A softball team has nine or 10 players. During a game two teams take turns fielding, or playing defense, and batting, or playing offense. The fielding team's pitcher stands on the mound. The catcher plays behind home plate to catch the ball. One player plays at each base, and the others cover the rest of the field.



Playing softball is a popular way to get exercise and have fun.

The batting team tries to score runs, or points, against the fielding team. It sends batters, one at a time, to home plate. Batters try to hit the ball, which the pitcher throws toward home plate. If the batter swings at the ball and misses, it is called a strike. If the batter does not swing, the pitch is called either a strike or a ball, depending on whether it was good or bad. Three strikes make an out, or the end of the batter's turn. Four balls make a walk, which means the batter goes to first base. If the batter hits the ball into the field, he or she begins to run around the bases.

After the batter hits the ball, the players in the field try to get the batter out. They can do this by catching the ball, touching the batter with the ball, or getting the ball to first base before the batter gets there. If the batter reaches a base without any of these things happening, the batter is safe. This player may then move to the next base when the next batter hits the ball. When a player on the batting team has touched all four bases, he or she scores a run.

The batting team keeps batting until there are three outs. After both teams have a turn batting, an inning is finished. Seven innings make up a game. At the end of the game, the team with more runs wins. The teams may play extra innings to break a tie score.

History

Many people think that softball was invented in Chicago, Illinois, in 1887. Men's and women's teams soon formed

Did You Know?

In its early days softball was known as kitten ball, mush ball, diamond ball, indoor-outdoor, and playground ball.



A player pitches the ball during a women's softball game at the Summer Olympics. Unlike in baseball, softball pitchers throw the ball with an underhand motion.

elsewhere in the United States and in Canada. The Amateur Softball Association of America (ASA) was formed in 1933. The ASA still oversees softball in the United States. The first International Softball World Championships were held in 1965. In 1976 the International Women's Professional Softball League was formed. In 1996 women's softball was added to the Summer Olympics.

► More to explore

Baseball • Olympic Games

Soil

Soil is a mixture of minerals and organic material that covers much of Earth's surface. Minerals are bits of rock, and organic material is the remains of living things that have died. Soil is not as solid

as rock. It has many small spaces, called pores, that hold water and air. In some places on Earth, a thin layer of soil only 6 inches (15 centimeters) thick lies on top of rock. In other places, though, soil may be hundreds of feet deep.

The Importance of Soil

Without soil, most life on Earth could not survive. Soil provides a place for plants to grow. It holds water in place for their roots. It contains nutrients, or food substances, needed for their growth. Soil also provides a home for many animals and other living things.

Soil forms slowly. A layer of soil that is 1 inch (2.5 centimeters) thick may take 500 to 1,000 years to form. For this reason it is important to protect soil from erosion—being blown or washed away.

How Soil Forms

The mineral part of soil forms from rocks. Such forces as wind, water, and



Dark layers of soil lie near the ground's surface in the U.S. state of Montana. Beneath them is glacial till—a mixture of clay, sand, and rocks that a glacier left behind when it melted away.

temperature changes break rocks down into tiny particles, or bits. The smallest particles are called clay. Medium-sized particles are called silt. The largest particles are called sand. Different types of soil contain different mixtures of clay, silt, and sand.

The organic part of soil forms when plants and animals die. Their bodies decay, or break down, and mix with the rock particles. The organic material, called humus, helps to form the pores in the soil. It keeps the soil soft and loose. Humus also provides the nutrients used by plants.

Layers of Soil

Soil is made up of layers. The layers rest on solid rock, called bedrock. A layer of broken rock rests on the bedrock. Some of this rock may have gone into forming the soil above. The soil above the broken rock is called subsoil. Subsoil contains mostly minerals and a small amount of humus. Only the deepest plant roots reach the subsoil. The top layer is called topsoil. Topsoil contains a lot of humus. It is the layer where plants grow.

► More to explore

Clay • Erosion • Mineral • Plant • Rock • Sand

Solar Energy

Solar energy is light, heat, and other forms of energy given off by the sun. Solar energy can be collected and used to heat buildings and to make electricity.



The roof of a house has flat-plate collectors that capture solar energy to heat air or water.

Solar Heating

Most solar heating systems capture solar energy with a device called a flat-plate collector. The collector is a large plate of black metal covered with a sheet of glass. It is usually placed on the roof of a building. The plate absorbs sunlight and uses it to heat air or water that flows through pipes behind it. The air or water then goes through the building's heating or plumbing system. It can also be held in a storage tank for later use.

Making Electricity

Devices called solar furnaces and solar cells can turn solar energy into electricity. A solar furnace uses the sun's heat to make electricity. It has mirrors that focus large amounts of solar energy into a small area. A solar furnace can produce temperatures of up to 3,630° F (2,000° C). This heat can be used to make steam. The steam can be used to make electricity in a power plant.

Solar cells use the sun's light rather than its heat. When the sun shines on a solar

cell, the cell turns the light energy into electricity. A single solar cell makes only a little electricity. However, groups of solar cells can provide electricity for whole buildings. Solar cells are also used in a variety of products, including calculators, watches, electronic toys, and portable radios.

Benefits and Costs

Solar energy has two big benefits over fossil fuels (coal, oil, and natural gas). First, though fossil fuels can be used up, there is an endless supply of sunlight. Second, solar energy does not cause pollution, like burning fossil fuels does. However, the equipment needed for

collecting and using solar energy is expensive. The high cost of solar energy has limited its use.

► More to explore

Electricity • Energy • Heat • Sun

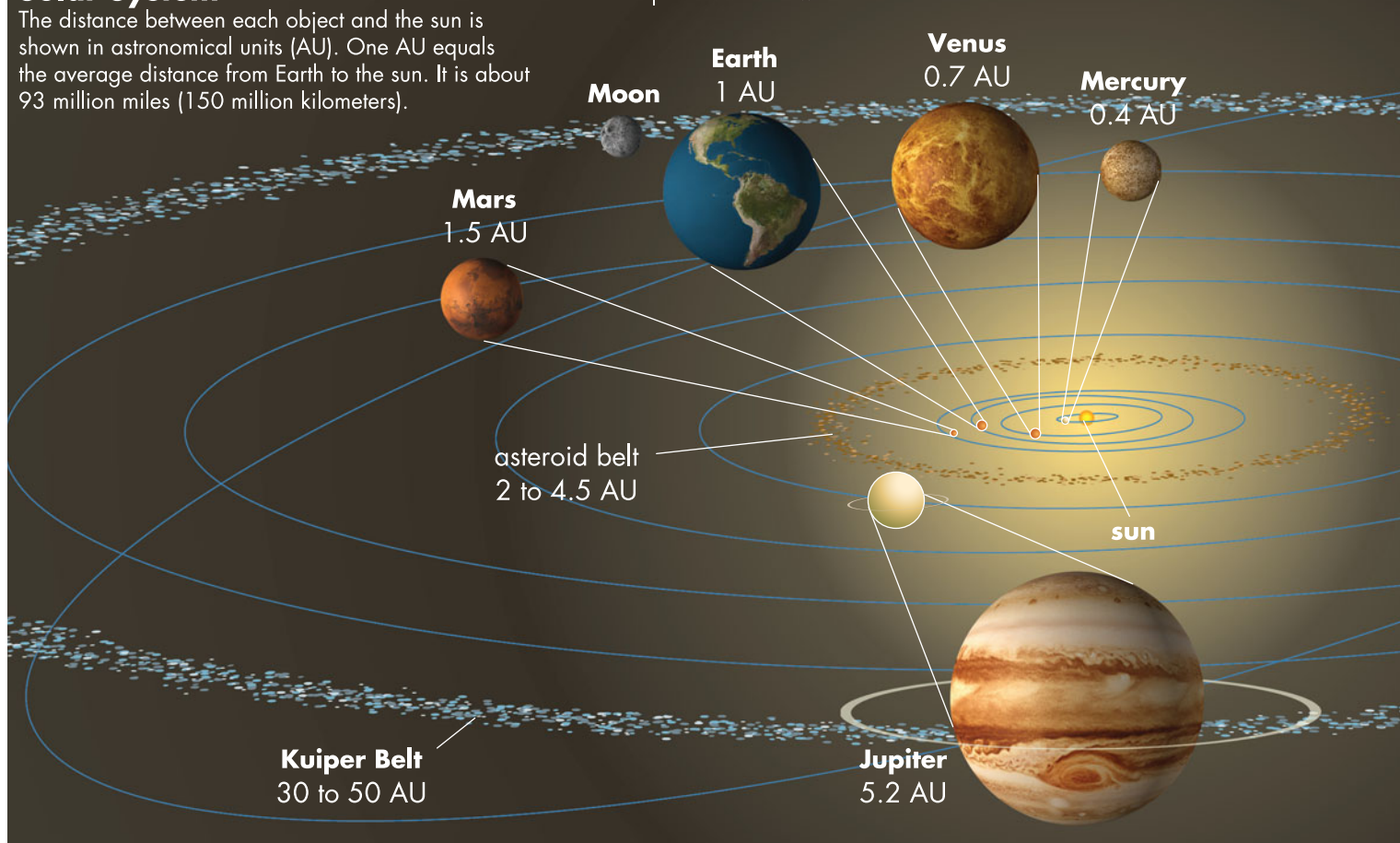
Solar System

The solar system consists of the sun and everything that orbits, or travels around, the sun. This includes the eight planets and their moons, dwarf planets, and countless comets, asteroids, and other small, icy objects. However, even with all of these things, most of the solar system is empty space.

Solar System

The distance between each object and the sun is shown in astronomical units (AU). One AU equals the average distance from Earth to the sun. It is about 93 million miles (150 million kilometers).

inner planets are shown in scale to each other



The solar system consists of the planets that orbit the sun as well as smaller bodies such as dwarf planets, comets, and asteroids.

The solar system itself is only a small part of a huge system of stars and other objects called the Milky Way galaxy. The Milky Way galaxy is just one of billions of galaxies that in turn make up the universe.

The Sun

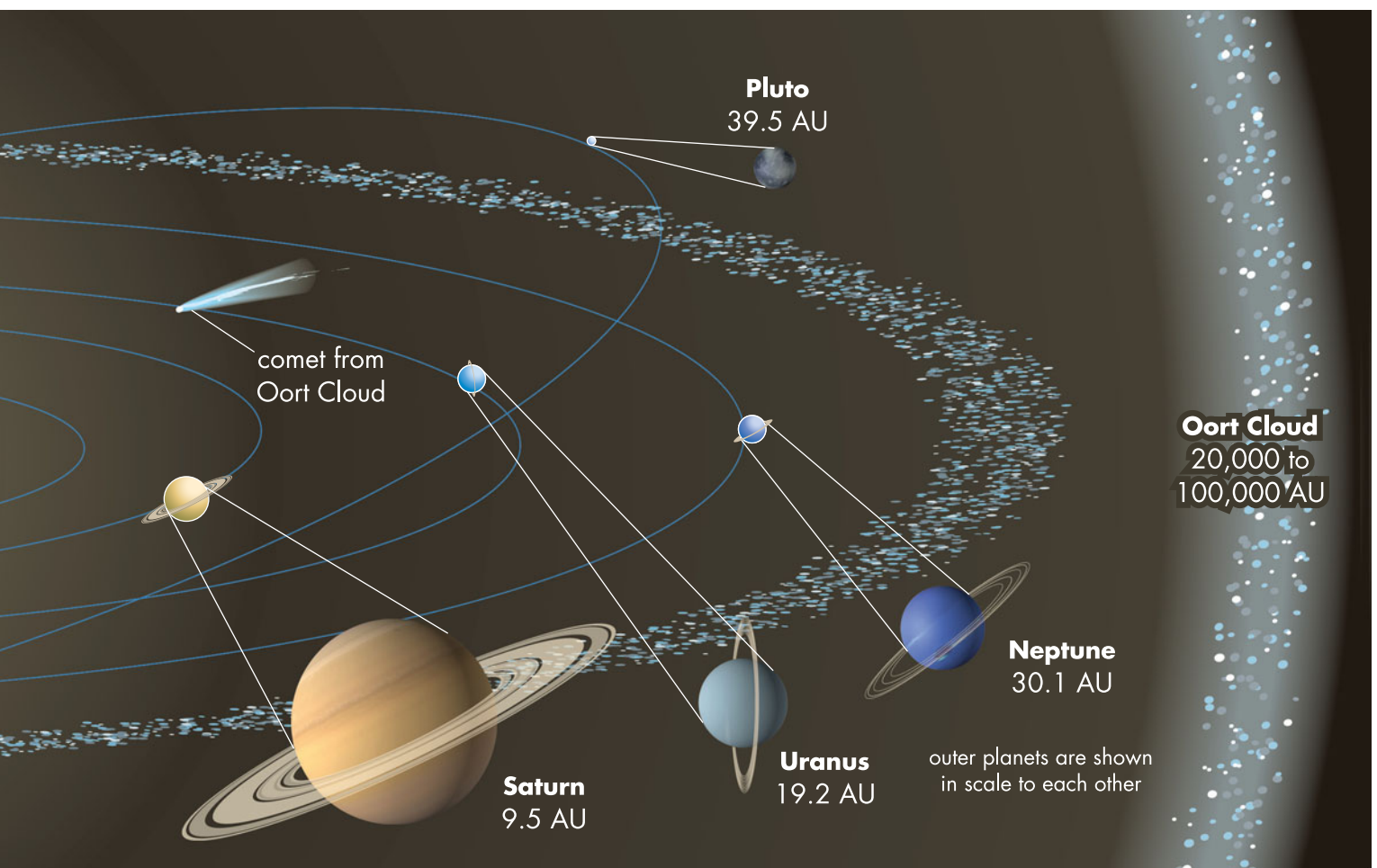
At the center of the solar system is a star called the sun. It is the largest object in the solar system. The sun is a very hot ball of hydrogen and helium gases. It constantly changes the hydrogen in its core into helium. This process gives out huge amounts of energy. Living things on Earth depend on light and heat from the sun.

The Solar Wind

The gases that surround the sun shoot out a stream of tiny particles called the solar wind. It flows outward through the whole solar system. The solar wind is what causes auroras, or displays of colored light in the night sky in parts of Earth.

The Planets

After the sun, the largest objects in the solar system are the planets. In order from closest to the sun, these planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Most of them orbit the sun in paths shaped like



The Oort Cloud is part of the solar system. It consists of countless small, icy objects. Many comets were once part of the Oort Cloud.

Some Facts About the Planets				
Name	Date Discovered	Diameter (approximate)	Period of Rotation (Length of Day) in Earth Days	Period of Orbit Around Sun (Length of Year) in Earth Years
Mercury	ancient times	3,000 mi (4,900 km)	58.6	0.24
Venus	ancient times	7,500 mi (12,100 km)	243	0.62
Earth		7,940 mi (12,780 km)	0.997	1
Mars	ancient times	4,200 mi (6,800 km)	1.03	1.88
Jupiter	ancient times	89,000 mi (143,000 km)	0.41	11.86
Saturn	ancient times	74,900 mi (120,600 km)	0.44	29.4
Uranus	1781	32,000 mi (51,000 km)	0.72	84
Neptune	1846	31,000 mi (50,000 km)	0.67	164

circles. Most of the planets have at least one moon. Scientists used to call Pluto the ninth planet. But in 2006 scientists decided to call Pluto a dwarf planet instead.

Asteroids

Millions of small chunks of metal and rock called asteroids also orbit the sun. Most asteroids are found in a ring between Mars and Jupiter. Small asteroids regularly fall to Earth or burn up in the sky as glowing meteors.

Comets

Comets are small chunks of dirt and ice. Billions of them orbit the sun in very long paths shaped like ovals. Most comets are too small or too distant to ever be seen from Earth. Comets come from two parts of the outer solar system: the Kuiper Belt and the Oort Cloud.

Outer Regions

Beyond Neptune lies the Kuiper Belt, a flat ring of millions of small, icy objects. These objects orbit the sun at a very great distance. They are mostly 30

to 50 times farther from the sun than Earth is.

At the outer reaches of the solar system is the Oort Cloud. It is a huge cloud of countless small, icy objects. The Oort Cloud surrounds the rest of the solar system.

How the Solar System Was Formed

The solar system formed about 4.7 billion years ago. It probably started as a loose cloud of gas and dust. Scientists think that a force called gravity pulled parts of the cloud together into clumps. The largest clump was squeezed together so tightly that it got very hot. This clump eventually became the sun. Over millions of years the other clumps became the planets. The sun’s strong gravity eventually pulled the planets into their orbits. Over time some of the left-over clumps became asteroids, comets, and other small, icy objects.

► More to explore

- Asteroid • Comet • Galaxy • Milky Way • Planets • Sun • Universe

Solomon Islands

The Solomon Islands is a country in the southwestern Pacific Ocean. The capital, Honiara, is on the country's largest island, Guadalcanal.

The islands lie east of Papua New Guinea, in the region called Oceania. The country includes eight main islands and hundreds of small islands. The main islands have many mountains and volcanoes. Many of the small islands are made of coral. The country's climate is hot, humid, and rainy.

Thick rain forests cover most of the land. Mangroves and coconut trees grow along the coasts. Many flowering plants, including orchids, also grow on the islands. The country has a wide variety of birds, butterflies, fish, and reptiles.

Most of the country's people are Melanesians, or people native to the southwestern Pacific islands. There are many local languages. The different groups communicate using Pijin, a lan-



Coral reefs surround some of the small islands in the Solomon Islands group.

guage based on English. Most of the people live in small villages.

The economy is based on farming, logging, and fishing. Farmers grow coconuts, sweet potatoes, taro, yams, and fruits. They raise pigs, cattle, and chickens. The Solomon Islands produces palm oil and cocoa.

People have lived on the Solomon Islands for at least 4,000 years. Spanish explorers visited the islands in 1568. Great Britain gained control of the islands by 1899.

In 1978 the Solomon Islands became independent from Britain. Since independence, violence between different groups has been a serious problem.

► **More to explore**
Honiara • Oceania



Facts About SOLOMON ISLANDS



Population
(2008 estimate)
517,000

Area
10,954 sq mi
(28,370 sq km)

Capital
Honiara

Form of government
Constitutional monarchy

Major towns
Honiara, Noro, Gizo, Auki, Tulagi





Somalia

The country of Somalia in northeastern Africa is a hot and dry land. Many of the people follow a nomadic, or wandering, lifestyle. The capital is Mogadishu.

Geography

Somalia sits on the Horn of Africa, the most eastern part of the continent. The Gulf of Aden lies to the north, and the Indian Ocean lies to the east. On land, Somalia borders Djibouti, Ethiopia, and Kenya.

Plains and high, flat areas called plateaus make up most of the land. Mountains rise in the northeast. Sand dunes stretch along the east coast. The Jubba and Shabeelle rivers flow through the south. Between those rivers is the richest farmland in the country.

Somalia is one of the world's hottest countries. The southwest and the north-



Girls at a school in northeastern Somalia wear green veils to class.

west receive more rain than the northeast, which is very dry.

Plants and Animals

Grasses and scattered trees cover much of the land. About two thirds of the land is used as pasture, or feeding areas for livestock. Few plants grow in the dry northeast.

Somalia's wildlife includes lions, leopards, hyenas, foxes, warthogs, ostriches, and antelope. Hunting has greatly reduced the numbers of giraffes, zebras, antelope, hippopotamuses, rhinoceroses, and elephants.

People

More than half of Somalia's people are nomads, or people who move from place to place while raising livestock. Settled farmers live mainly in the south. Almost all the people are Somalis. The Somalis are divided into many clans, or groups of related families. Small groups of Ban-



tus and Arabs also live in the country. Nearly everyone is Muslim.

Somali and Arabic are the national languages. Some people also speak English or Italian. The Somali language did not have a written form until 1973.

Economy

Somalia is one of the poorest countries in the world. Its economy is based on livestock raising and farming. Sheep, goats, camels, and cattle are the main livestock. Farming is possible on only a tiny percentage of the land. The main crops include bananas, sugarcane, sorghum, corn, cassava, cotton, and sesame seeds. Somalia sells live animals, bananas, fish, animal hides, charcoal, and scrap metal to other countries.



Somalia is a very poor country. Most of the land is not good for growing crops. Many of the people live in small villages and raise livestock.

History

The coasts of Somalia were probably part of an ancient land called Punt. Between the 600s and 900s Arabs and Persians set up trading posts along the coasts. By the 900s Somali nomads had entered the area.

European Rule

Europeans explored the region in the 1800s. In 1884 the British took over a section in the north, which they called British Somaliland. Italy soon took over several regions in the northeast and along the southern coast. The land claimed by Italy was known as Italian Somaliland. In 1960 Italian Somaliland and British Somaliland gained independence. Together they formed the new country of Somalia.

Civil War

In 1969 the military took over Somalia's government. In January 1991 rebels overthrew the military government. The country then split into a number of regions, each controlled by a clan or a group of clans. In May 1991 the region that used to be British Somaliland declared independence as the Republic of Somaliland. Civil war broke out as the clans fought for territory. In 1998 the northeastern part of Somalia, known as Puntland, also set up a government of its own.

A new Somali government formed outside the country in 2004. However, fighting continued inside Somalia.

► More to explore

Mogadishu • Nomad

Facts About SOMALIA



Population
(2008 estimate)
8,956,000

Area
246,000 sq mi
(637,000 sq km)

Capital
Mogadishu

Form of government
Transitional government

Major cities
Mogadishu, Hargeysa, Kismaayo, Berbera, Marka

Songbird

Almost half the species, or types, of bird in the world are songbirds. The 4,000 species of songbird all belong to one huge scientific group. Many types sing beautiful and complex songs. However, not all songbirds sing much or have pleasant-sounding voices. What they have in common are highly developed vocal organs. Some well-known songbirds include canaries, cardinals, robins, blackbirds, bluebirds, nightingales, sparrows, finches, larks, swallows, and thrushes.

Birds of this large, varied group can be found nearly all over the world. They live on many different types of land.

Physical Features

Songbirds are typically about 5 to 8 inches (12.5 to 20 centimeters) in length, though some are larger or smaller. The structure of their feet allows them to perch on branches. On each foot, three toes point forward, and one toe points backward.



The grasshopper warbler is a songbird of Europe and Asia.

The syrinx, or song box, is the organ in a bird's chest that produces sound. A bird sings by sending air through its song box. Songbirds have very complex song boxes and several sets of tiny muscles to control them. Some songbirds make mostly short, simple calls, such as the "caw" of some crows. Other types also produce long songs that are musical and varied. Some songbirds, such as mockingbirds, even imitate the songs of other birds.

Behavior

Songbirds sing for a variety of reasons, especially during the breeding season. Their songs show that they are ready to mate. Songbirds may also make a variety of calls to communicate with their mates and young. Many songbirds sing to announce that a certain territory is theirs. They sing at different spots along the edges of their land to try to prevent other birds from taking over it. In many species only the male sings complicated songs.

Different types of songbird eat different foods, including insects, fruits, and seeds. Many types are known for building complex nests.

► More to explore

Bird • Blackbird • Bluebird • Canary
• Cardinal • Crow • Mockingbird
• Nightingale • Robin • Sparrow

Songhai Empire

The Songhai Empire controlled trade in much of western Africa during the 1400s and 1500s. The empire was cen-



tered in what is now central Mali. It eventually extended west to the Atlantic coast and east into what are now Niger and Nigeria. Songhai grew rich trading gold and salt up and down the Niger River and across the desert lands of the Sahara.

Songhai people had settled in the city of Gao in about AD 800. The Mali Empire took over Gao in 1325. After 50 years the Songhai won back their independence. A great Songhai warrior named Sonni 'Ali took power in 1464. He built the Songhai Empire by conquering Timbuktu, Jenne, and other nearby cities.

Most Songhai people raised herds of animals for a living. However, many Songhai lived in big cities. All the cities were centers of trade on the Niger River. Gao was the capital. It had about 100,000 people. Timbuktu had at least 80,000 people. It was the site of a famous university. While most of Song-

hai's herders continued to follow traditional religions, Islam became the religion of the cities.

The empire prospered until the late 1500s. Then an army from Morocco, a kingdom on Africa's northwestern coast, swept down over the Sahara. By 1591 the Moroccans had easily captured the cities because they had better weapons than the Songhai had. The people outside the cities continued to fight the Moroccans, but they could not bring back the empire.

► More to explore

Mali • Mali Empire

Sorghum



Hundreds of seeds are bunched together on a sorghum plant.

Sorghum plants belong to the grass family, as do corn and other grains. Sorghum is one of the major grains grown in Africa. Farmers also grow sorghum in

Did You Know?

Sorghum grows better in hot and dry conditions than most other grains.

the Americas, Asia, southern Europe, and Australia.

Sorghum plants often grow to a height of 2 to 8 feet (0.5 to 2.5 meters). Some may grow to be 15 feet (4.5 meters) tall. Clusters of flowers grow at the top of each sorghum plant. The clusters produce 800 to 3,000 seeds.

Farmers grow and harvest sorghum for these starchy seeds. The seeds are a cereal grain like wheat, rye, oats, and rice. People grind them to make cakes, breads, and porridge, which is a dish similar to oatmeal. People also use sorghum plants to feed animals, to make hay, and to make brooms and brushes.

In some types of sorghum the stems contain sweet juices. In the southern United States and in southern Africa farmers grind sorghum stems to collect the juices. They then boil the juices to make a thick, sweet syrup, also called sorghum.

► More to explore

Grain • Grass • Seed

Soto, Hernando de

► see De Soto, Hernando.

Sound

A sound is anything that can be heard. Music, the barking of a dog, the wailing

of a siren, and the voice of a friend are all sounds.

What Makes Sound

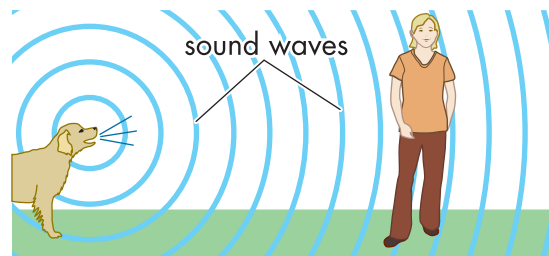
For a sound to be made and heard, three things need to happen. First, an object vibrates. A vibrating object makes tiny, very fast back-and-forth movements. For example, when a musician strums guitar strings, they vibrate. The vibration moves the surrounding air and produces waves of sound.

Second, the sound waves pass into a medium. A medium is any substance through which the waves can travel. Sound waves may travel through many mediums. These include air, water, and solid objects. Sound waves pass through mediums in all directions.

Third, some kind of receiver, such as the ear of a person, picks up the sound waves. The ear changes the sound waves into signals that travel to the brain. The brain understands these signals as sound.

Speed of Sound

The speed of sound varies depending on what medium it is traveling through. In air at a temperature of 70° F (21° C) sound travels at a speed of 1,129 feet (344 meters) per second. This means



Sound waves travel through air from a source to a receiver.



Sound can damage a person's hearing if it is too loud. Construction workers and other people who cannot avoid loud sound should wear protective equipment over their ears.

that it takes sound about five seconds to travel one mile. In warmer air sound travels faster. Sound travels even faster through water and solid mediums such as iron and stone.

Pitch, Intensity, and Quality

Every sound has three basic properties: pitch, intensity, and quality. The pitch of a sound is how high or low it is. Faster vibrations cause sounds with a higher pitch. The intensity of sound is how loud or soft it is. Intensity depends on the strength of the vibrations. Stronger vibrations cause louder sounds. The quality, or timbre, of a sound is how harsh or pleasant a sound seems.

Loud sounds can damage a person's hearing over time. Loud sounds that have a high pitch can be especially damaging.

► More to explore

Ear

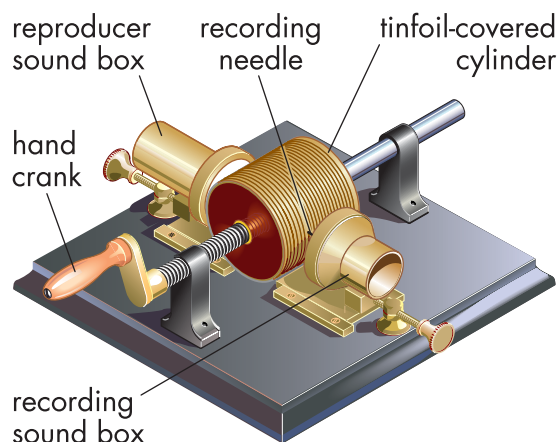
Sound Recording

Sound recording, or audio recording, is the storage of sounds so that they can be heard again. In professional and home recording studios, special equipment records the music that people listen to on compact discs (CDs) and their computers. Sound recording is also used in radio, television, and movies.

How Sound Recording Works

Sound is caused by tiny vibrations that travel through the air as waves. Sound-recording devices use a microphone to change the sound waves into electric signals that resemble the waves. A playback device turns the electric signals back into sound waves. It sends the

1877 Edison Phonograph



Thomas Edison's first phonograph recorded sound when someone spoke into the recording sound box while turning the hand crank. The recording sound box pressed a needle-like object called the recording stylus against the tinfoil cover of a rotating cylinder. A person could play the recording back by turning the crank while pressing another stylus against the same tinfoil. Then the reproducer sound box would reproduce the original sounds.



Two people can listen to a portable MP3 player if they share a set of earphones. A portable MP3 player is a digital audio player.

waves to loudspeakers to reproduce the original sound.

Recording devices can preserve sound in a number of formats. The earliest formats were phonograph records and magnetic tape. A phonograph record has a groove with patterns cut into it that represent the waves of sound. Magnetic tape represents sound with wavelike patterns of magnetized particles.

Most sound-recording devices today are digital devices. They store sound as a long series of numbers that describe the sound waves. On CDs this information is stored as a pattern of tiny pits, or holes, that are created and read by a laser beam. The digital information can also be stored in personal computers or in

portable devices called digital audio players.

History

In 1877 Thomas Edison, a U.S. inventor, made the first device for recording and playing back sound. It was a phonograph made up of a cardboard cylinder wrapped in tinfoil. It recorded sound with a small needle that formed a track in the tinfoil. Ten years later an inventor named Emil Berliner improved Edison's device by replacing the cylinder with a flat phonograph record. Berliner also invented a way to make copies of records. By the early 1900s records had become a popular form of home entertainment.

German engineers developed tape recorders in the 1930s and 1940s. U.S. and British researchers improved on the German equipment in the late 1940s. By the early 1980s music cassette tapes had become more popular than phonograph records.

Also in the early 1980s compact discs were introduced. Since then CDs have mostly replaced records and cassettes. At first people could only buy prerecorded CDs to play on a CD player. But in the 1990s recordable CDs were introduced. This technology allowed people to make their own CDs using a computer or a separate CD recorder. The first digital audio players appeared in the late 1990s.

► More to explore

Compact Disc • Edison, Thomas Alva
• Sound

South Africa

The country of South Africa covers the southern tip of Africa. It has three capital cities: Pretoria (Tshwane), Cape Town, and Bloemfontein.

Most of South Africa's people are black. However, white people controlled the government until 1994.

Geography

South Africa has a long coastline on the Atlantic and Indian oceans. To the north South Africa borders Namibia, Botswana, Zimbabwe, Mozambique, and Swaziland. South Africa also surrounds the tiny kingdom of Lesotho.

Most of South Africa is a plateau, or raised flat area. Mountains separate the high plateau from lower plains along the coast. The highest mountain range is the Drakensberg, in the east. The Kalahari and Namib deserts cover parts of the west. The main rivers in South Africa are the Orange and the Limpopo.

Most of South Africa has a dry climate with warm summers and cool winters. Drought is a common problem.

Plants and Animals

Grasslands with scattered trees cover much of South Africa. Many types of flowering plants grow in the southwest. The dry parts of the west have shrubs and bushes that can survive with little rain. South Africa's few forests grow in mountain valleys and along stretches of the coast.



South African schoolgirls enjoy themselves while on a field trip in the Western Cape Province, South Africa.

South Africa has limited numbers of lions, elephants, rhinoceroses, hippopotamuses, and antelope. The country's large animals live mainly in wildlife parks.

People

Black Africans make up about three fourths of South Africa's population. They belong to a number of groups, including the Zulu and the Xhosa. Each





A prince of the Zulu people of South Africa wears traditional clothing.

of the African groups has its own language.

Facts About SOUTH AFRICA



Population
(2008 estimate)
48,783,000

Area
470,693 sq mi
(1,219,090 sq km)

Capitals
Pretoria (executive), Bloemfontein (judicial), Cape Town (legislative)

Form of government
Republic

Major cities
Cape Town, Durban, Johannesburg, Pretoria, Port Elizabeth

South Africa has three main minority groups: people of European descent, people of mixed ancestry, and people of Asian descent. The people of European descent speak either Afrikaans (a language related to Dutch) or English. The Afrikaners (those who speak Afrikaans) have mainly Dutch, French, and German roots. The English speakers have mainly British ancestors. The people of mixed descent have African, Asian, and European roots. The ancestors of the people of Asian descent came mainly from India.

Most South Africans are Christians. More than half of the people live in cities, mainly in the east.

Economy

Services such as banking and tourism are key parts of South Africa's economy. Mining and manufacturing are also very important. South Africa is a top producer of many minerals, including gold,

platinum, and chromium. It also mines coal and diamonds. Factories make iron and steel, food products, machinery, chemicals, cars, and other goods.

South Africa's major crops include corn, wheat, sugarcane, citrus fruits, and potatoes. Farmers also grow grapes to make wine. Meat, wool, and milk are other important farm products.

History

About 10,000 years ago the San and the Khoekhoe peoples roamed southern Africa. About 2,000 years ago peoples who spoke Bantu languages settled in the region. The Bantu peoples were the ancestors of most of the blacks in South Africa today.

European Settlement

The Portuguese sailed around the southern tip of Africa in the late 1400s. In 1652 the Dutch set up a colony on the southwest coast. They slowly expanded their settlements, planted crops, and raised livestock. They became known as Boers, meaning "farmers." (Later they became known as Afrikaners.) As the Boers moved east, they fought with many African peoples, especially the Xhosa.

By 1806 the British had taken over the Dutch settlement. To escape British rule, many Boers moved north during the 1830s and 1840s. Their move is known as the Great Trek. In the 1850s the Boers set up two states in the northeast: the South African Republic (or Transvaal) and the Orange Free State.



TIMELINE

The Dutch settle in South Africa.

1652

The British win the Boer War.

1902

The British take over the Dutch colony.

1806

The Union of South Africa is formed.

1910

The African National Congress is founded.

1912

Nelson Mandela is released from prison.

1990

South Africa elects its first black president; apartheid ends.

1994

British Rule

The British expanded their territory, called the Cape Colony, across the southern tip of Africa. They then tried to take over the Boer states. From 1899 to 1902 the British and the Boers fought the Boer War. After winning the war, the British made the Boer states into British colonies.

In 1910 all the British colonies in southern Africa united. They formed a new, independent country called the Union of South Africa.

Apartheid

Whites controlled the new government of South Africa. They passed laws that separated the population by race. This system of separation became known as apartheid. The word means “separateness” in the Afrikaans language. The system also gave the white minority nearly all the political power, most of the land, and the best jobs.

In 1912 blacks and people of mixed ancestry formed a political group that became known as the African National Congress (ANC). The ANC held non-violent protests against the white government. In 1960 police shot hundreds of protesters in Sharpeville, South Africa. In response, the ANC turned to bombings and other acts of violence to protest apartheid. Some ANC leaders, including Nelson Mandela, went to jail.

A New South Africa

In 1990 a new South African president, F.W. de Klerk, announced that apartheid would end. The government released Mandela from prison and threw out the apartheid laws. South Africans of all races voted in elections in 1994. Mandela became the country’s first black president.

► More to explore

African National Congress • Apartheid
• Bloemfontein • Cape Town • Mandela, Nelson • Pretoria

South America

South America is the world's fourth largest continent. The countries of South America are also part of a larger cultural region known as Latin America, in which most of the people speak Spanish or Portuguese.

Land and Climate

Most of the continent is covered by rugged mountains and plateaus, which are high, flat lands. In the north are the Guiana Highlands. The Brazilian Highlands, another group of mountains and plateaus, covers more than half of Brazil. This amounts to about a quarter of South America. The Andes Mountains lie along the western edge of the continent. They are one of the most impressive ranges in the world. In eastern Peru and western Bolivia is a great plateau called the Altiplano. In the far south is a region of vast plateaus known as Patagonia.



Rugged mountains form a dramatic backdrop for the city of Ushuaia, in the province of Tierra del Fuego, Argentina.

South America has several rivers that form large basins. These basins are generally flat and low-lying. The largest is the Amazon basin. It includes parts of Brazil, Venezuela, Colombia, Ecuador, Peru, and Bolivia. The Paraná and Orinoco rivers also form basins.

The Amazon River is the most extensive river system in the world. Other major rivers include the Orinoco, Paraguay, Paraná, and Uruguay. Parts of the Andes have many lakes. In addition, vast marshes are found in many low-lying parts of the continent.

Most of South America has a tropical climate. In the tropical rain forests of the north and east, it is hot and rainy year-round. Parts of central South America have generally warm summers and cool winters, with plenty of rain. There are also several desert areas, including the coast of Peru and northwestern Argentina. In the far southern parts of Argentina and Chile and high in the mountains, it is mostly cold and rainy year-round.

Plants and Animals

The Amazon River basin contains the world's largest area of tropical rain forest. Many types of tree are found there. However, people are rapidly destroying large areas of rain forest. This is mainly because settlers are trying to use the land for agriculture or to build roads and houses. Savannas, which are grasslands with some trees, are typical in central





Misty spray rises from Iguazu Falls to create rainbows. The waterfalls are located on a stretch of the Iguazu River along the border between Brazil and Argentina.

Venezuela and Brazil. The coastal deserts of Chile and Peru have little vegetation.

Two of the better-known animals of the Andes are the llama and the alpaca. Other mammals include several cats (especially the jaguar and puma), deer, bears, wolves, foxes, and raccoons.

Mammals such as monkeys, porcupines, armadillos, anteaters, sloths, and a wide variety of rats, mice, and bats live in the rain forests. South America has more than a thousand kinds of bird. Hummingbirds, parrots, toucans, woodpeckers, and raptors can be found in different regions of the continent. The Andean condor is one of the largest flying birds. The Humboldt penguin is found in several spots along the coasts. There are also numerous types of fish and reptile, including many lizards and snakes.

People

Various groups of Native Americans, or American Indians, were the continent's original inhabitants. Today the population is a blend of several distinct groups: Native American, European (mostly Spanish and Portuguese), and African.

About 40 percent of the people in South America are white. Another 40 percent have mixed ancestry, either as mestizos (of white and Indian descent) or mulattoes (of black and white descent or black and Indian descent).

Most South Americans speak Spanish or Portuguese. Many Indian languages, such as Quechua and Aymara, are also spoken. In some areas people speak English, French, or Dutch. Most South Americans are Roman Catholic. In some countries people blend Catholicism with traditional elements from African and Indian religions.

In general, children in South America must attend primary school. However, in some remote areas people do not have access to schools. Nearly all South American cities have hospitals, but doctors and advanced medicines are not always available. The greatest health problems are in the rural districts, particularly in the low plains and river valleys of the tropics. There insects carry diseases such as malaria, and impure water is common. People who live in the

crowded, poorer city neighborhoods also have a higher risk of health problems.

Economy

For many years the economies of most South American countries were not well developed. Most people worked in agriculture, and there was not much industry. The countries also relied on foreign aid. But in the late 1900s many South American countries began to try to improve their economies by increasing manufacturing.

South America has great mineral wealth. It has about one fifth of the world's iron ore. South America also has large quantities of oil and natural gas. Copper, tin, lead, and zinc are mined in the Andes. Brazil mines many gems.

Agriculture is a large part of the South American economy. Cattle and sheep are raised throughout the continent. Argentina is a leading exporter of beef. Farmers also raise llamas and alpacas for their wool. Coffee, cacao, sugarcane, pine-

Facts About SOUTH AMERICA

Area

6,882,027 sq mi (17,824,370 sq km)

Population

(2008 estimate) 378,448,500

Largest Country by Area

Brazil: 3,287,612 sq mi (8,514,877 sq km)

Smallest Country by Area

Suriname: 63,251 sq mi (163,820 sq km)

Largest Country by Population

Brazil: (2008 estimate) 187,163,000

Smallest Country by Population

Suriname: (2008 estimate) 516,000

Largest Cities

São Paulo, Brazil; Buenos Aires, Argentina; Rio de Janeiro, Brazil; Lima, Peru; Bogotá, Colombia

Longest River

Amazon River: 4,000 mi (6,400 km)

Largest Lake

Lake Maracaibo, Venezuela: 5,150 sq mi (13,300 sq km)

apples, and bananas grow in the tropical and subtropical regions. Farther from the equator, people grow corn, oranges, wheat, and vegetables. But some countries cannot produce enough food for their people. Those countries must import food.

Brazil is the leading manufacturing country in South America. Factories in Brazil and Argentina make cars and trucks. Clothing is made in a number of countries. Financial and business services are vital to every country in South America. Tourism has become increasingly important.



A Peruvian farmer leads a llama. In the Andes Mountains, especially in Bolivia, Peru, and Ecuador, people raise llamas for their wool.

History

American Indians have lived in South America for many thousands of years. By about 2000 BC several groups had societies with highly developed cultures. By at least the AD 1400s, these had developed into such large Indian groups as the Inca of the Andes Mountains, the Chibcha of Colombia, and the Guaraní of Paraguay. When the Europeans came to South America, the Inca Empire covered a large section of the continent.

European exploration of the continent began when Christopher Columbus arrived in the north in 1498. In the early 1500s Spanish and Portuguese sailors began exploring—and then taking over—large areas of the continent. The Portuguese gradually took possession of what is now Brazil. The Spanish claimed

the rest of the continent. They ruled over the Native Americans. The Spanish forced them to mine for gold and silver and to work the land. Huge numbers of Indians died from diseases they caught from the Europeans and from harsh working conditions. The Europeans brought enslaved Africans to the continent to replace the lost workers.

In the 1800s growing numbers of people in South America began to demand independence from Spain. The main revolutionary campaigns were directed by two outstanding military leaders: José de San Martín and Simón Bolívar. They were ultimately successful. By the middle of the century all the Spanish colonies had become independent nations. There was very little fighting in Brazil, however. In 1822 the Portuguese recognized Brazil as an independent empire. In 1889 the Brazilians formed a republic.

Many of the new countries in South America set up governments based on the democratic pattern of the United States and France. However, over the years military leaders have often seized power and created dictatorships. At the beginning of the 21st century, there were many economic problems in South America as well. A small number of rich people owned most of the land, farms, and businesses. Many more people lived in poverty.



The military leader Simón Bolívar helped South American countries to win independence in the 1800s.

► More to explore

Amazon River • Andes • Argentina
• Brazil • Inca • Llama

South Australia



South Australia is one of Australia's six states. It contains some of the driest, emptiest areas of the country. Adelaide is the state's capital and main port.

Geography

South Australia borders Western Australia on the west; the Northern Territory on the north; Queensland, New South Wales, and Victoria on the east; and the Indian Ocean on the south. South Australia covers an area of 379,725 square miles (983,482 square kilometers).

South Australia's land is mostly low and flat. More than two thirds of the inland area is a dry region with little plant life and few people. In the northeast is a part of the Great Artesian Basin. The basin is the world's largest region of natural springs (water that flows from underground). The Murray River is the only major river in the state. It provides most of the water for Adelaide. The state has a dry climate, with cool winters and warm summers.

Plants and Animals

In the dry areas of South Australia few plants other than acacia trees and shrubs grow. Eucalyptus trees grow in the rainier areas of the south. People have also planted forests of pine trees in the southeast.

South Australia's animals include many types of birds and reptiles. The state is also home to many marsupial mammals (animals that usually carry their young in a pouch). These include kangaroos, possums, and the hairy-nosed wombat.

People

South Australia has a population of about 1.5 million. Most of the people have British or other European ancestors. Less than 2 percent of South Australians are Aborigines, the original people of Australia.

About three quarters of the state's people live in Adelaide. The other large cities are Whyalla, Mount Gambier, Port Augusta, and Port Pirie.



Clumps of grass grow in South Australia's Strzelecki Desert.



The Murray River is one of Australia's longest rivers. It flows through South Australia.

Economy

Many people in South Australia work in services—for example, health care, education, and retail shops. Many others work in manufacturing. The state's manufactured goods include cars, metal pipes, chemicals, paper, and cloth.

South Australian farmers grow grapes, vegetables, oranges, wheat, and barley. They also raise cattle, pigs, chickens, and sheep. The state produces most of Australia's wine and much of its wool.

Mining is another important part of the economy. Mines in South Australia pro-

vide iron, salt, and the mineral gypsum. The state is also a major world source of precious gems called opals. Large natural gas fields in the north produce much of Australia's natural gas supply.

History

Aborigines have lived in what is now South Australia for at least 23,000 years. Dutch explorers traveled along the coast in the 1600s. The British navigator Matthew Flinders explored the area in about 1802.

Colonists from Great Britain began to settle in South Australia in 1836. In the mid-1800s the colonists began to produce wheat, wool, and copper. This activity helped the colony to grow.

South Australia gained control of what is now the Northern Territory in 1863. When Australia gained independence from Britain in 1901, South Australia became a state. The Northern Territory was separated from the state in 1911.



The Adelaide Festival Centre is a group of theaters near the Torrens River in Adelaide, South Australia.

► More to explore

Australia • Northern Territory

South Carolina

South Carolina was the first Southern state to withdraw from the United States on the eve of the American Civil War. South Carolina was also the site of the first battle of the war. The state capital is Columbia.

Geography

South Carolina is located in the southeastern part of the United States. The state borders North Carolina on the north, Georgia on the west, and the Atlantic Ocean on the east.

The southern and eastern parts of South Carolina are covered by a broad coastal plain. Along the coast are sandy islands separated from the mainland by marshes and lagoons. One of those islands is Hilton Head, a resort area off the state's southern tip. The western part of South Carolina is an area of rolling hills. A portion of the Blue Ridge Mountains rises in the northwest corner of the state. South Carolina has long, hot, humid summers and mild winters.

People

White people of European heritage account for about two thirds of South Carolina's population. The percentage of African Americans in South Carolina is more than double the national average. African Americans make up about 30 percent of the state's population; the national average is 12 percent. More than 2 percent of the population is Hispanic American.

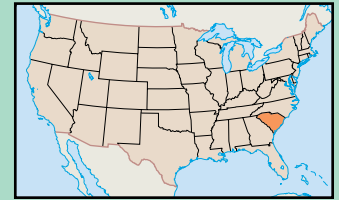
Economy

Chemicals, metal products, and textiles (cloth goods) are leading manufactured goods in South Carolina. Historically, the state has been known for the production of textiles. Since the late 1990s, however, South Carolina's textile industry has declined. The main chemical products include plastic resins, dyes, and medical drugs.

Tourism is popular because of South Carolina's warm climate and beautiful coastline. Some of South Carolina's major agricultural products are chickens, turkeys, and tobacco.

History

Native American groups, including the Catawba, the Cherokee, and the Yama-see, lived in the area when Europeans first arrived. The first permanent English settlement was Charles Town, established in 1670 and named for King Charles II. In 1729 the colony was



Facts About SOUTH CAROLINA

Flag



Population

(2000 census)
4,012,012—
rank, 26th state;
(2008 estimate)
4,479,800—
rank, 24th state

Capital

Columbia

Area

32,020 sq mi
(82,932 sq km)—
rank, 40th state

Statehood

May 23, 1788

Mottoes

*Animis
Opibusque Parati*
(Prepared in
Mind and
Resources); *Dum
Spiro Spero*
(While I Breathe,
I Hope)

State bird

Carolina wren



State flower

Yellow jessamine



divided into North Carolina and South Carolina.

South Carolina planters prospered during the colonial period. By 1775, however, the people of South Carolina were unhappy with British rule. They joined with other American colonies in fighting against the British during the American Revolution. Many of the war's battles were fought in South Carolina.

Cotton became the state's main crop after the invention of the cotton gin in 1793. The machine removed the seeds from raw cotton, making it easier to process. Slavery became widespread as a way to provide free labor for picking cotton on the plantations (large farms).

Like other Southern states, South Carolina disagreed with Northern states, which wanted to end slavery. These ten-



Crowds of people enjoy South Carolina's Myrtle Beach.



Historic homes and landmarks line the Battery, a park overlooking the harbor in Charleston, South Carolina.

sions eventually resulted in South Carolina leaving the Union on December 20, 1860, to join the Confederacy. The American Civil War began on April 12, 1861. On that day Confederate soldiers opened fire on Fort Sumter, a U.S. Army post near Charleston, South Carolina. The Confederacy lost the war in 1865. South Carolina rejoined the Union in 1868.

In the 20th century many New England textile mills relocated to Southern states such as South Carolina. Although pockets of poverty still existed in the state, the mills provided work for many South Carolinians. In 1989 Hurricane Hugo caused great damage to the South Carolina coast. In the early 21st century the textile industry in South Carolina suffered as foreign competition increased. But the state continued to attract tourists to resort areas such as Hilton Head Island and Myrtle Beach.

► More to explore

American Civil War • Columbia

South Dakota

The U.S. state of South Dakota is named for the Dakota, or Sioux, Indians who first lived in the region. South Dakota is known as the Mount Rushmore State because of its most famous tourist attraction. The Mount Rushmore National Memorial is a huge, man-made sculpture carved into a granite mountainside. The sculpture features the faces of four U.S. presidents. The state capital is Pierre.

Geography

South Dakota is bordered on the south by Nebraska, on the west by Montana and Wyoming, on the north by North Dakota, and on the east by Minnesota and Iowa.

Eastern South Dakota is a flat prairie region. The western two thirds of the state consists of plains that are higher in elevation than the eastern prairies. The landscape in this area is broken by hills and canyons. Within the western plains is a large, rugged region called the Badlands. In the far west is a mountainous, forested area known as the Black Hills. The Black Hills are home to Mount Rushmore and to Harney Peak. With a height of 7,242 feet (2,207 meters), Harney Peak is the nation's highest point east of the Rocky Mountains.

The Missouri River runs downward through the middle of the state. It then turns eastward and becomes South Dakota's southeastern boundary with

Nebraska. South Dakota has warm summers and cold winters.

People

The great majority of the state's residents are of European heritage. Many are of German, Scandinavian, or Irish descent. Native Americans are the largest minority group, making up more than 8 percent of the population. Most of the approximately 62,000 Native Americans in South Dakota are Sioux.

Economy

Service industries such as tourism, trade, and financial services are the largest part of the state's economy. The main manufacturing industries include food processing and the production of computer and electronic goods. South Dakota's major crops are corn and soybeans. Cattle and hogs are also valuable.



**Facts About
SOUTH DAKOTA****Flag**

Population
(2000 census)
754,844—rank,
46th state; (2008
estimate)
804,194—rank,
46th state

Capital
Pierre

Area
77,117 sq mi
(199,731 sq
km)—rank, 17th
state

Statehood
November 2,
1889

Motto
Under God the
People Rule

State bird
Chinese ring-
necked pheasant



State flower
Pasque



The Mount Rushmore National Memorial in the Black Hills of southwestern South Dakota features the faces of George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln.

History

Native Americans lived in the area for centuries before the arrival of Europeans. French explorers claimed the region for their country in the 1740s. France sold the land to the United States in 1803 as part of the Louisiana Purchase. The Lewis and Clark Expedition traveled through the region in 1804.

The first permanent European settlement in the area was a trading post established on the Missouri River in 1817. The Dakota Territory was created in 1861. White settlement in the area expanded after gold was discovered in the Black Hills in 1874. South Dakota was admitted to the Union as the 40th state in 1889.

Native Americans and white settlers fought wars from the 1850s to 1890. In that year U.S. troops massacred more than 200 Sioux in the battle of Wounded Knee. Afterward most Native Americans lived on reservations.

In 1973 members of the American Indian Movement occupied the town of Wounded Knee. They wanted to call attention to the needs of Native Americans. In 1979 the U.S. government gave the Sioux millions of dollars as repayment for forcing them from the Black Hills region. In the 1990s many tribes built casinos on reservation lands as a way of making money.

► More to explore

Pierre • Sioux

South Korea

► see Korea, South.

Soviet Union

► see Union of Soviet Socialist Republics.

Space Exploration

Through space exploration humans have learned a great deal about the planets, stars, and other objects in space. More than 5,000 spacecraft have been launched into space to gather information since 1957. They include spacecraft with humans on board, space probes, and satellites.

Astronauts

Astronauts (called cosmonauts in Russia and taikonauts in China) go through a thorough training program. They study math and science in classrooms. They learn to operate their spacecraft by using computer-controlled simulators. These devices present astronauts with conditions that they will later experience during actual flight. Astronauts also make special trips in airplanes to get used to the feeling of weightlessness.

Humans cannot survive in outer space on their own. The environment is not the same as it is on Earth. Astronauts therefore travel in space in tightly sealed compartments. They bring their own



The space shuttle *Discovery* prepares to dock with the International Space Station in July 2006.

supply of oxygen with them. Once in space, astronauts may conduct scientific experiments. They also may make repairs to their spacecraft or other equipment in space.

The Race into Space

In the 1900s scientists developed rockets that could travel fast enough to overcome the pull of the force called gravity. This knowledge allowed the Soviet Union to launch the first artificial satellite on October 4, 1957. It was called Sputnik 1, and it orbited around Earth. On April 12, 1961, Yuri Gagarin became the first human to circle Earth in space. In 1963 Valentina Tereshkova became the first woman in space.

The National Aeronautics and Space Administration (NASA) took charge of the U.S. effort. The first U.S. satellite was launched on January 31, 1958. On May 5, 1961, astronaut Alan B. Shepard, Jr., became the first American to enter space. Shepard flew for only 15 minutes. On February 20, 1962, John H. Glenn, Jr., completed three orbits

around Earth. On July 20, 1969, astronaut Neil Armstrong became the first human to walk on the Moon.

Space Stations

Scientists began building space stations in the early 1970s. Space stations are spacecraft that stay in orbit for a long period of time. Scientists can spend days or even months at a station doing experiments. The Soviet station *Mir* stayed in orbit from 1986 to 2001.

In the 1990s, 16 countries agreed to build and operate a large space station together. The new project was called the International Space Station (ISS). The first crew began to live in the station in November 2000.

Space Shuttles

In 1981 the United States launched the first reusable spacecraft, called a space shuttle. The main section has wings and is called the orbiter. Attached to the orbiter are rockets, fuel tanks, and oxygen tanks. These boost the craft through the thickest part of Earth's atmosphere. When their fuel is used up, the boosters fall into the ocean, where they can be recovered. At the end of a mission, the orbiter returns to Earth and lands like an airplane.

The first shuttle missions were successful. Astronaut Sally Ride became the first U.S. woman in space on June 18, 1983. But in January 1986 the shuttle *Challenger* exploded 73 seconds after liftoff. All seven crew members were killed. NASA stopped the shuttle program to study the cause of the explosion.

Did You Know?

The space shuttles are used to bring astronauts and supplies to and from the space station.

They also allow scientists to conduct experiments in outer space.



Two robots were sent to the planet Mars in 2003. An artist's computer drawing provides an idea of what the robot Opportunity might look like on the planet.

The United States returned to space in September 1988 with the launching of the shuttle *Discovery*. The shuttles made many successful trips. But then in February 2003 the shuttle *Columbia* broke apart as it was returning to Earth. The seven crew members on board were killed. The shuttle program did not resume until 2005.

Space Probes

Space probes are vehicles that carry scientific equipment but no passengers. Some make one-way voyages into deep space. Probes are controlled from Earth by radio. They send back their findings the same way.

Probes have landed on Mars and Venus and have flown past Jupiter, Saturn, Uranus, and Neptune. They have collected information on the planets' atmospheres, moons, and ring systems.

► More to explore

Armstrong, Neil • Exploration • Ride, Sally • Rocket • Satellite

Spain

Spain is a large country in western Europe. It once controlled a huge empire in the Americas. Spain's capital is Madrid.

Geography

Spain takes up most of the Iberian Peninsula, a block of land in southwestern Europe. Spain shares borders with Portugal, France, and Andorra. South of Spain is Gibraltar, a British colony. The Mediterranean Sea lies to the east and southeast. The Atlantic Ocean lies to the north, northwest, and southwest.

Two groups of islands also belong to Spain. The Canary Islands are in the Atlantic Ocean, northwest of Africa. The Balearic Islands are in the Mediterranean. In addition, Spain controls the cities of Ceuta and Melilla in northern Morocco.

Most of the land is a high plain in the center of the country. Mountain ranges surround the plain. The Pyrenees Mountains form a natural border between Spain and France. Spain has many rivers, including the Duero, the Tagus, and the Ebro.

Most of Spain has hot summers and cool winters. The south is drier than the north.

Plants and Animals

Meadows and forests cover northern Spain. Oak and pine trees grow in the



The Pyrenees Mountains are a feature of northeastern Spain.

mountains. Scattered evergreen oaks and grasses grow in central and southern Spain.

Spain's wildlife includes deer, wild boars, and ibex (a type of wild goat). The Pyrenees are home to many birds of prey, including eagles, owls, and buzzards.





A flamenco dancer whirls in a ruffled dress. Flamenco is a form of traditional music and dance of the Roma (Gypsy) people of southern Spain.

People

Most of the people of Spain are Spanish. Roma (or Gypsies) are the largest minority group. Roman Catholicism is the main religion. Most people live in cities or towns.

Most people in Spain speak Castilian, which is generally called Spanish. People in the east also speak Catalan. Those in the northwest also speak Gallego, or Galician. The Basque people of northern Spain also speak Euskara, or Basque.

Economy

Spain's economy depends on services, manufacturing, and mining. Tourism is one of the most important service industries. The country's manufacturers make clothing, shoes, food products, chemicals, metals, machinery, and cars. Spain's

mines provide coal, zinc, iron ore, lead, and other minerals.

Farming is a small part of the economy. Spain's crops include grains, sugar beets, olives, citrus fruits, and vegetables. Spain is also a major producer of wine. Farmers raise sheep, pigs, cattle, and goats. Fishing is another source of food.

History

Roman and Muslim Rule

In ancient times many different peoples from Europe and North Africa settled in Spain. The Romans ruled the region from the 200s BC to the AD 400s.

Muslim Arabs invaded in 711. They quickly captured most of the Iberian

Facts About SPAIN



Population
(2008 estimate)
45,661,000

Area
195,363 sq mi
(506,988 sq km)

Capital
Madrid

Form of government
Constitutional monarchy

Major cities
Madrid, Barcelona, Valencia, Seville, Zaragoza



The Spanish architect Antoni Gaudí designed many amazing buildings in the early 1900s. The church of the Holy Family in Barcelona, Spain, is one of his most famous buildings. It was still not finished in the early 21st century.



TIMELINE

Muslims invade Spain.		Spain's king becomes head of an empire in Europe and the Americas.		The Spanish Civil War breaks out.		Juan Carlos becomes king of Spain and makes Spain a democracy.
711	1492	1519	1701	1936	1939	1975
	Christians defeat the last Muslims in Spain.		The War of the Spanish Succession begins.		Dictator Francisco Franco takes power.	

Peninsula. The Muslims held power for more than 700 years.

Christian Spain

After many years Christian kingdoms in the north began to take back territory piece by piece. By the late 1200s the kingdoms of Castile and Aragon had conquered most of the area controlled by the Muslims. In 1469 Prince Ferdinand of Aragon married Princess Isabella of Castile. The two kingdoms were officially united in 1479. By that time Ferdinand had become king of Aragon and Isabella had become queen of Castile. In 1492 Castile and Aragon captured the last Muslim kingdom, Granada. Spain was then a united Christian country.

Ferdinand and Isabella banned all religions other than Roman Catholicism. A court called the Inquisition punished people who were not Catholic. Spain also forced thousands of Jews to leave the country.

World Empire

In 1492 Spanish ships commanded by Christopher Columbus reached the Americas. Spanish explorers soon claimed territories around the world for Spain.

Spain also stretched its empire through Europe. Charles, the grandson of Ferdinand and Isabella, belonged to a powerful family called the Hapsburgs. In 1516 he became the king of Spain. In 1519 he became Emperor Charles V of the Holy Roman Empire as well.

Loss of Power

Spain lost power in the 1600s, when the country fought many costly wars. In 1700 the last of the Spanish Hapsburgs died. Many European countries fought to take the Spanish throne in the War of the Spanish Succession. At the end of the war Spain lost its European territory. A French prince became king of Spain.



The Alhambra is a palace and fortress in Granada, Spain. The Muslim rulers of Granada built it during the 1200s and 1300s.

Most of Spain's overseas colonies won independence in the 1800s. Spain lost other territory to the United States after the Spanish-American War of 1898.

Civil War and Dictatorship

Spain became a democratic republic in 1931. However, a civil war broke out in 1936 between two Spanish groups. Rebel forces called the Nationalists fought the Republicans, who wanted to keep the republic form of government. The fighting was very fierce and destructive. The Nationalists won the civil war in 1939.

The Nationalist leader Francisco Franco soon took control of the country. He ruled Spain as a dictator (a ruler with unlimited power) for 36 years.

Recent Events

After Franco died in 1975, Spain became a kingdom again. King Juan Carlos made the country a constitutional monarchy. Spain then developed a closer relationship with other western European countries. It joined the European Community (now the European Union) in 1986.

Meanwhile, Spain faced a number of terrorist attacks. A group of Basques carried out many of the attacks. In 2004 terrorists from the Muslim group al-Qaeda blew up trains in Madrid.

► More to explore

Basque • European Union • Ferdinand and Isabella • Hapsburgs • Inquisition • Madrid • Spanish Civil War • Spanish-American War

Spanish-American War

The United States easily defeated Spain in the Spanish-American War of 1898. The war forced Spain to give up control of Cuba, the last of its colonies in the Americas. It also helped to make the United States a world power.

Path to War

Cuba is an island in the Caribbean Sea, close to the U.S. state of Florida. Spain ruled Cuba harshly. The people of Cuba rebelled against the Spanish in 1895. Many people in the United States wanted their government to help the Cubans. Owners of U.S. companies that did business in Cuba also wanted their government to act. They were afraid that a long revolution would hurt their companies.

William McKinley became president of the United States in 1897. At first he wanted to stay out of Cuba. Even so, he sent a warship called the *Maine* to Cuba to protect U.S. citizens. On February 15, 1898, an explosion sank the *Maine*. No one knew who set off the blast, but it made people in the United States even angrier at Spain.

Fighting the War

In April 1898 the U.S. Congress threatened Spain. Spain declared war on April 24. The United States declared war one day later. The war was fought both in the Caribbean and in the Philippines.



Soldiers in the Spanish-American War stand ready to defend their camp.

The Philippines is an island group in the Pacific Ocean that Spain then ruled as a colony.

On May 1 the U.S. Navy, led by George Dewey, destroyed all the Spanish warships in the Philippines. By August U.S. forces controlled Manila, the capital of the Philippines.

Meanwhile, U.S. forces attacked Spanish troops in Cuba. Among the U.S. forces were Theodore Roosevelt and his group of volunteer soldiers, called the Rough Riders. As they pushed into the city of Santiago, the Spanish ships in the city's harbor had to move out to sea. Then the U.S. Navy quickly defeated them. The Spanish surrendered on July 17.

Results

The United States and Spain signed a peace treaty in Paris, France, in Decem-

ber 1898. Spain gave up Cuba, which became an independent country. Spain gave the United States control of Puerto Rico (another Caribbean island) and the Pacific Ocean island of Guam. The United States paid Spain 20 million dollars for control of the Philippines.

The war made Theodore Roosevelt a national hero. He was elected vice president in 1900. He became president when President McKinley was assassinated in 1901.

► More to explore

Cuba • Guam • McKinley, William
• Philippines • Puerto Rico • Spain
• United States

Spanish Civil War

From 1936 to 1939, two opposing groups of citizens waged a bitter fight for control of Spain. The Spanish Civil



War fought a group called the Nationalists.

War decided Spain's government until the 1970s.

Background

In the decades after World War I (1914–18), politics in Spain became deeply divided. One group wanted things to stay as they were. This was the ruling class made up of wealthy landowners, businesspeople, military leaders, and conservative Roman Catholics. On the other side were those who wanted social change. This group included farm workers, labor union members, and educated middle-class people.

In 1931 King Alfonso XIII allowed elections to be held. When the people voted to set up a republic, the king fled the country. The people soon became dissatisfied with the new government, however. There were many demonstrations and protests. On February 16, 1936, elections were held to choose a new government. The groups that were pressing for reforms banded together as the Popular Front. They won the election.

War

But the people who had been the ruling class were not willing to give up control of Spain. They became known as Nationalists because they wanted to preserve the nation as it was. On July 17 they launched a military uprising against the government. General Francisco Franco led the uprising. This soon turned into war.

Franco got help from the governments of Italy and Germany. The Republican side (those who supported the Popular

Front) got help from the Communist government of the Soviet Union. The Republicans also had the aid of about 40,000 individuals from other countries. Groups of these foreign fighters became known as the International Brigades.

The Nationalists had two big advantages. They controlled the military, and they were united under Franco. The Republicans did not have enough weapons. They also began to fight among themselves.

The Nationalists steadily won territory in the north and south. In the spring of 1938 they moved east toward the Mediterranean seacoast. On March 28, 1939, they marched into Madrid, the capital city, without even having to fight. General Franco then had control of the entire country.

Results

The Spanish Civil War was very bloody. Between 500,000 and 600,000 people may have died, not counting those who starved or died from diseases. The foreign supporters of each side in the war fought each other again in World War II. That war started later in 1939, but Franco kept Spain out of the war. He ruled Spain as a dictator (ruler with unlimited power) until his death in 1975.

► More to explore

Spain

Sparrow

Many types of small, brownish or grayish songbird are called sparrows. They

are among the best-known birds in the world. They live in a wide range of places, including cities, farms, grasslands, woodlands, and marshes. Sparrows eat mostly seeds and insects.

Many types of sparrow look fairly similar. They all have cone-shaped bills, which they use to crush seeds. They all are small birds with various patterns and streaks. For instance, the house sparrow is about 5 to 6 inches (12 to 15 centimeters) long. It has brown or reddish brown upper parts and a gray underside. The male has black on the throat and around the eyes. The song sparrow is about the same size or slightly larger. Its wings and tail are reddish brown. Its breast is white with many dark streaks, often with a dark spot in the center.

Despite their similarities, not all sparrows are closely related. There are two main groups of sparrows: Old World sparrows and New World sparrows. These groups belong to separate bird families.

Old World Sparrows

Old World sparrows come from Europe, Asia, and Africa. However, some types have spread to other areas. For instance, the house sparrow is an Old World sparrow that is now common nearly all over the world. It is also called the English sparrow. Many people consider this tough, noisy bird a pest. It takes the nesting sites of bluebirds and other songbirds. Other Old World sparrows include the Eurasian tree sparrow and the chestnut sparrow.

Did You Know?

The dusky seaside sparrow was a type of sparrow that lived in Florida. In the 1900s people destroyed its habitat. The last such sparrow died in 1987.



A Eurasian tree sparrow perches in a holly bush.

New World Sparrows

New World sparrows are found in North America and South America. They are related to finches, buntings, and cardinals. The song sparrow is a New World bird named for its complex, musical songs. Among the many other types of New World sparrow are the chipping sparrow, the savannah sparrow, and the American tree sparrow.

► More to explore

Bird • Bluebird • Cardinal • Songbird

Sparta

Sparta was a city-state of ancient Greece. It was the chief city of a region called Laconia. Spartans loved military strength and ruled harshly.

Society

Sparta was very different from Athens, another great city-state of ancient Greece. The Spartans did not care about art or philosophy. Instead they valued bravery, strength, and obedience.

At age 7, Spartan boys had to leave their parents. They grew up together in military style groups. They built up their bodies by exercising and playing sports. The strongest and bravest became captains. Girls also learned Spartan values, but their upbringing was less strict.

All male Spartan citizens became soldiers at age 20. Men retired from soldiering at age 60 and could then become elders.

Sparta had two kings who ruled together. A council of elders helped the kings to rule. Only citizens of Sparta could participate in the government.

A group of people who lived outside of the city worked in Sparta as merchants and craftspeople. A third group called the helots farmed the lands of the Spartans. The helots were almost like slaves. They made up most of the population of Laconia.



A Spartan warrior is pictured on a Greek vase from the 400s BC.

History

Sparta was most likely founded in the 800s BC. Spartan armies helped to fight off Persian invaders of Greece in wars called the Persian Wars (492–449 BC). Athens won the biggest victories in the Persian Wars. However, in the Peloponnesian War (431–404 BC), Sparta defeated Athens and became the most powerful Greek city.

Sparta's power did not last long. Later battles weakened many of the Greek city-states. By 339 BC King Philip II of Macedonia had conquered most of Greece, including Sparta. In the 100s BC, Roman armies took over Sparta. A Germanic group called the Visigoths destroyed the city in AD 396.

► More to explore

Athens • City-State • Greece, Ancient
• Persian Wars

Special Olympics

Special Olympics is a worldwide organization that offers sports programs for people with intellectual (mental) disabilities. The programs are free and year-round. They include athletic training and competition in more than 20 sports. Special Olympics helps its athletes to gain physical fitness and self-confidence. It also helps them to gain the respect of their communities.

More than 1.7 million children and adults in more than 150 countries participate in Special Olympics activities. Every two years athletes from around the world participate in the Special Olympics



Children in a Special Olympics program take part in a 50-meter footrace.

World Games. The World Games alternate between Winter Games and Summer Games. Before the games begin, athletes take an oath that gladiators (professional fighters) used in ancient Rome: “Let me win. But if I cannot win, let me be brave in the attempt.”

Special Olympics was the idea of Eunice Kennedy Shriver. Shriver was a sister of U.S. president John F. Kennedy. In 1962 Shriver started a day camp at her home for children with intellectual disabilities. The Special Olympics programs grew from there. In 1968 the First International Special Olympics World Games took place in Chicago, Illinois.

► More to explore

Olympic Games • Sports

Speech

Speech, or talking, is the form of language that people can hear. (Writing is the other main form of language.)

People use speech to communicate with others.



Speaking face-to-face is one of the many ways people communicate with one another.

From birth, babies make many different kinds of sounds. They learn to speak by copying the sounds that they hear around them. Children usually begin to say some words between the ages of 1 and 2. However, it takes years for a child to master the ability to speak.

How Humans Produce Speech

People speak by forming different sounds in a certain order. These sounds make up words that others can understand.

At the base of the throat is the larynx, or voice box. Inside the larynx are the vocal cords. These are a pair of stretchy folds that create the voice. When a person exhales air from the lungs, it passes between the vocal cords. The air makes the vocal cords vibrate, or tremble. This vibration creates sounds. The larynx

makes these sounds louder. Then they pass through the throat, mouth, and nose.

Sounds simply passing out of the mouth are not speech. People use the tongue, teeth, lips, jaw, and palate (roof of the mouth) to shape the sounds to make words. For example, placing the tongue between the teeth makes a “th” sound.

Speech Disorders

Sometimes people have speech disorders, or problems with speech. Children often develop a lisp as they are learning to speak. A lisp is the use of a “th” sound for “s” and “z” sounds. Some children develop a stutter. Stuttering includes repeating sounds, making sounds longer than normal, or pausing before making sounds. People who suffer a head injury or a stroke may develop aphasia. This disorder makes it difficult for a person to speak or to understand speech.

Do Animals Speak?

Animals do not use language in the same way that people do. But many animals do communicate using sounds. For example, dogs can whine, bark, growl, snarl, and howl. These sounds may express fear, danger, hunger, or other information. Some birds, such as the gray parrot, can even copy human speech. Nevertheless, humans are the only animals that can use speech to express complicated ideas.

► More to explore

Communication • Language • Sound
• Writing

Sphinx

The sphinx is a creature in mythology. It has the body of a lion and the head of a human. Sphinxes appear in the art and legends of ancient Egypt and ancient Greece.

Ancient Egyptians made many large statues of sphinxes. The city of Luxor has a street lined with sphinxes. The largest and most famous Egyptian sphinx was carved near the pyramids of Giza in about 2500 BC. Called the Great Sphinx, it has the head of an Egyptian king.

The ancient Greeks started creating sphinxes in about 1600 BC. Their sphinxes had wings. Later Greek sphinxes were always female. A story of Greek mythology tells that the Sphinx of Thebes asked a riddle and ate people who could not solve it. She asked, “What animal walks on four legs in the morning, two legs at noon, and three

legs at night?” Eventually the Greek hero Oedipus gave the correct answer: a person. (A person crawls on all fours as an infant, walks on two legs when grown, and leans on a cane in old age.) Then the Sphinx killed herself.

► More to explore

Animals, Legendary • Egypt, Ancient
• Greece, Ancient • Pyramid

Spice

Spices are the dried parts of various plants that have strong fragrances or flavors. People use spices to flavor foods. They also use the oils of spice plants to make perfumes, cosmetics, toiletries, and toothpastes. Spices have played an important role in world history. The search for spices led many explorers to discover new lands.

Spices come from the seeds, fruits, or other parts of certain plants. Cardamom, black pepper, coriander, poppy, sesame, and nutmeg are seeds. Cloves are flower buds, and chilies and allspice are fruits. Cinnamon is made from the bark of a tree. Ginger and turmeric are roots. When leaves of certain plants are used in a way similar to spices, they are usually known as herbs.

In ancient times people used spices in medicines and skin creams. They used them in religious ceremonies, too. Sometimes people used spices to keep foods from spoiling. They also used spices to hide the bad flavor of meats that had already spoiled.

Did You Know?

Black pepper is probably the most popular spice. It comes from a vine that was originally found in India.



The Great Sphinx at Giza, Egypt, is a huge statue that is roughly 4,500 years old. It has the body of a lion and the head of an ancient Egyptian king.



Many kinds of colorful spices are sold in markets.

Most spice plants grow in warm regions. Hundreds of years ago, the people of Europe had to get many of their spices from India and several islands that are now part of Indonesia. Traders used ships and camel caravans for transportation. The journey sometimes took as long as two years. This made spices very expensive. In the 1400s Europeans began searching for sea routes to East Asia that would make getting spices easier. These explorations led to the European discovery of the Americas.

► More to explore

Americas, Exploration and Settlement of the • Herb • Plant

Spider

Spiders are eight-legged creatures known for making silk webs to catch insects. They live everywhere in the world except for Antarctica. There are about 38,000 species, or types, of spider. They are related to scorpions, ticks, and mites.

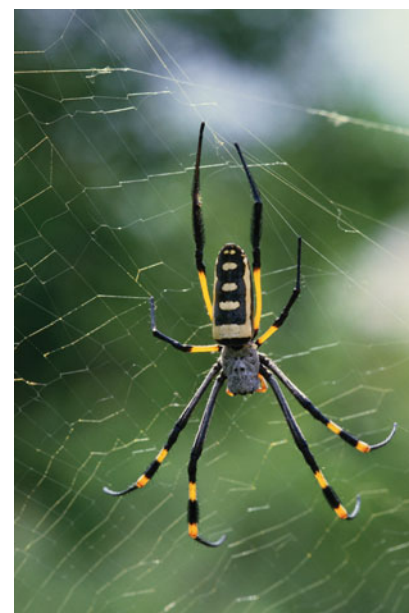
Physical Features

Spiders are about 0.02 to 3.5 inches (0.5 to 90 millimeters) long. The largest spiders are tarantulas. A spider's body is separated into two parts: the cephalothorax and the abdomen. The cephalothorax contains the stomach and brain. The legs are attached to this part of the body. The abdomen contains the gut, the heart, the reproductive parts, and the silk-making parts.

Spiders have four pairs of legs. The legs may have claws at the tip. A few species use the first pair of legs as feelers to find prey.

Spiders have silk-making organs called spinnerets near the back of their body. They spin silk from a liquid made by special glands. It becomes solid thread after the spider pushes it out of its body.

Many spiders make venom, or poison, that they shoot into their prey. The



A spider waits for insects to fly into its sticky silk web.

venom of most spiders is not harmful to people. But a few spiders, including the black widow and the brown recluse, can cause pain and sometimes death in humans.

Behavior

Spiders feed mostly on insects. Some spiders are hunters that chase and overpower their prey. These spiders typically have a good sense of touch or sight. Other spiders instead weave silk webs to trap flying insects. Some spiders also use silk to wrap their prey, protect their eggs, or make nests.

Spiders are the only animals that digest their food outside their bodies. After capturing its prey, a spider covers it with digestive juices. The juices break down the prey's body into a liquid form that the spider sucks up. Spiders repeat this process many times and eventually digest most of the prey.

Life Cycle

Female spiders lay egg sacs that hold several to a thousand eggs. The young of most species go off on their own when they come out of the egg sac. Spiders change little in appearance as they grow. They molt, or shed their outer covering, multiple times before becoming adults.

► More to explore

Insect • Scorpion • Silk • Tick and Mite

Spinach

Spinach is a green leaf vegetable. It is a rich source of vitamins A and C and the



Spinach leaves are a source of the vitamins that every person needs.

mineral iron. The scientific name of spinach is *Spinacia oleracea*.

Spinach is widely grown in northern Europe and the United States. Growing spinach requires cool weather and rich, moist soil. Spinach is one of only a few vegetables that can live through some frost.

The spinach plant is an annual. This means that it grows for only one season and must be replanted each year. People grow spinach to eat its leaves. Spinach leaves can be either smooth or wrinkled. They are roughly triangular in shape. The leaves are clustered in a circle called a rosette.

Spinach is sold fresh, canned, and frozen. People eat it as a salad green or as a cooked vegetable. It also can be used to make soups and dips.

Spiny Anteater

► see Echidna.

Spokane

The Spokane are Native Americans of northeastern Washington State. They traditionally lived along the Spokane River. The city of Spokane, Washington, was named after the tribe.

The Spokane hunted deer, elk, antelope, and other animals. They also gathered wild plants and fished, especially for salmon. In the 1730s they were introduced to horses. They used the horses to hunt bison (buffalo) on the plains to the east.

The Spokane built cone-shaped homes made of pole frames covered with mats or animal skins. They moved these homes from place to place while on the

hunt. The Spokane also built larger, rectangular houses in shallow pits.

By the early 1800s white settlers had set up trading posts in Spokane territory. At first the Spokane welcomed the newcomers. But the tribe became angry as the number of settlers grew. In 1858 the Spokane joined the Coeur d'Alene and other Native American neighbors in a war against U.S. troops. The war is known as the Spokane War or the Coeur d'Alene War. The Native Americans were defeated. They had to give up some of their land.

In the 1870s and 1880s the Spokane agreed to settle on reservations. In 1881 the United States set up the Spokane Reservation northwest of the city of Spokane. At the end of the 20th century there were about 2,000 Spokane living in the United States. Many lived on the reservation.

► More to explore

Coeur d'Alene • Native Americans



Three Spokane men display their weapons in a photograph that was taken in the 1860s.

Sponge

Sponges are unusual animals that live in water. They do not have the body parts that most animals have. They do not even move around. Instead sponges stay attached to an underwater rock or coral reef. For a long time people thought sponges were plants. Scientists decided that sponges are animals only after watching them eat food by drawing it into their bodies.



An orange sponge is shaped somewhat like a fan. Sponges vary greatly in color, shape, and size.

There are nearly 5,000 different species, or kinds, of sponge. Most live in the ocean, but some live in freshwater. Sponges can be flat like spreading moss. Or they can look like trees with branching arms. Some are as small as a bean, while others are as tall as a person. Sponges can be smooth and mushy, or they can be rough, hard, and prickly. Some are dull and drab, but others are brightly colored.

A sponge's body is a soft mass of cells supported by a skeleton. Holes in a sponge's skin let water flow inside. Sponges take food and oxygen from the water. They do not have organs for breathing, eating, and getting rid of wastes. Each cell has to do these things.

Sponges are useful to people. People collect sponges and then dry, clean, and trim them. The fleshy parts are thrown away, and only the skeleton is used. The ancient Greeks and Romans used sponges to pad their war helmets and armor. People still use sponges for bath-

ing, mopping, and painting. However, most of the sponges used today do not come from animals. They are products made in factories.

► More to explore

Animal • Ocean

Sports

A sport is a physical activity that people do for fun and as a way to compete with others. People have enjoyed sports for thousands of years. Every sport has a set of rules that the players follow.

Types of Sports

In some sports one person competes against other individuals. Examples of these sports include boxing, wrestling, gymnastics, figure skating, diving, pole vaulting, and horseback riding.



Soccer is a popular team sport for children and adults around the world.

Did You Know?

The physical activity of sports can make people healthier.

In team sports a group of people plays against another group, or team. A team may have as few as two members, or it may have many members. A doubles team in tennis has two players. Five players make up a basketball team. An ice hockey team has six players, and a baseball team has nine. Eleven players make up a football, soccer, or cricket team.

Sports can be amateur or professional. Amateur athletes do not get paid for participating in a sport. Professional athletes play for money.

Sports also can be organized or unorganized. Children who get together for neighborhood football games are playing unorganized sports. No organization controls their games. In organized sports athletes play for a school, a business, a club, a community, or some other organization. The organization schedules games and enforces the rules of the sport. Organized sports can be amateur or professional.

History

Since ancient times people have run races, wrestled, and hunted for sport. Ancient people in many parts of the world also played games with balls.

In some ancient cultures sports were a part of religious practices. This was especially true of the Greek Olympic Games, which began in 776 BC. The ancient Greeks played these games to honor their gods.

The ancient Romans related athletic games to military skills, not religion. They did such sports as boxing, wrestling, chariot racing, and throwing spearlike sticks called javelins.

After ancient times people continued to play sports, but they were usually unorganized. Organized sports became more common in the 1700s and 1800s. People created leagues and other organizations to control athletic competitions. They also wrote down sets of rules for different sports.

► More to explore

Baseball • Basketball • Boxing • Cricket • Football • Gymnastics • Hockey, Ice • Ice Skating • Olympic Games • Soccer • Tennis • Track and Field • Wrestling

Springfield



Population
(2000 census)
111,454;
(2007 estimate)
117,090

Springfield is the capital of the U.S. state of Illinois. The city lies on the Sangamon River. Abraham Lincoln lived in Springfield for more than 20 years before he became the president of the United States.



A statue of U.S. President Abraham Lincoln stands near the state Capitol in Springfield, Illinois. Lincoln lived in Springfield before he became president.

Many people in Springfield work for the government. Many others work in service industries such as health care, tourism, communications, or insurance. The city is also a trading center for crops and livestock produced on nearby farms.

In about 1818 a man named Elisha Kelly built a cabin in what is now Springfield. He was the city's first settler.

Lincoln and eight other Illinois lawmakers helped make Springfield the capital of Illinois in 1837. Lincoln lived in the city from 1837 until he became president in 1861. Today tourists can visit Lincoln's tomb and former home in Springfield. The Abraham Lincoln Presidential Library and Museum was opened in the city in 2005.

► More to explore

Illinois • Lincoln, Abraham

Spy

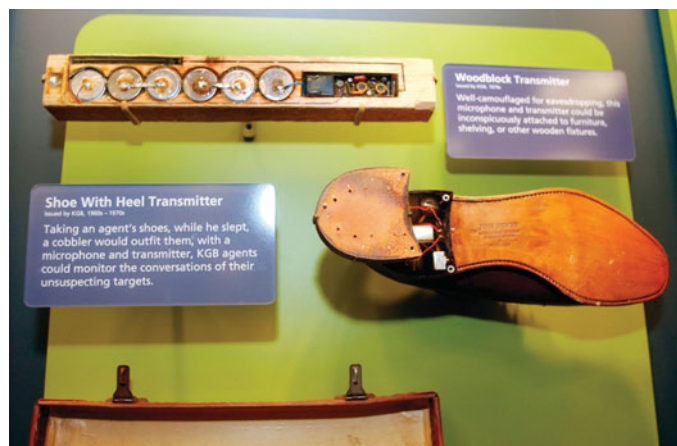
A spy is a person whose job is to get secret information. Governments and businesses hire spies. Spies try to keep others from discovering who they are and what they do. The work of spying is also called espionage.

Spy Work

Spying often takes place during wartime. Spies for one side try to find out what the enemy is planning. Government spies may also gather information about other countries during peacetime.

A different type of spy works in business. These spies try to get information about products or processes that other companies keep secret.

Spies usually gather information that people cannot get in ordinary or legal ways. They may buy or steal secret information from people. They may use cam-



Some spies use cleverly hidden microphones to listen in on secret conversations. Microphones disguised in a piece of wood and in the heel of a shoe are displayed at the International Spy Museum in Washington, D.C.

eras, microphones, or other technology to gather information. Some spies pretend to work for one government or business while actually spying on it for another government or business. These spies are called double agents or moles.

Spy History

Spying has gone on since ancient times. The ancient Egyptians and Chinese used spies more than 2,000 years ago. European kings and queens almost always had spies. These spies kept track of enemies at home and in other countries.

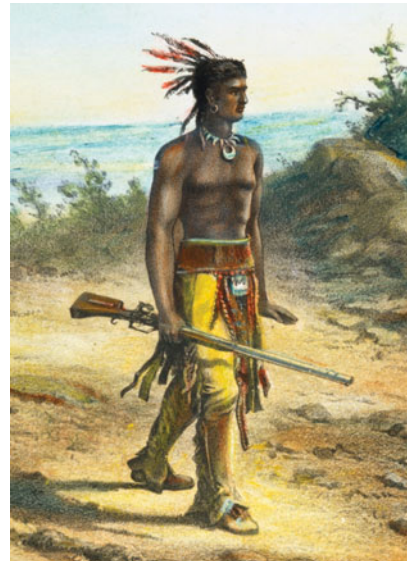
Spies were an important part of the American Revolution and the American Civil War. Spies also played major roles in World War I, World War II, and the Cold War.

In the 1900s many governments created organizations to collect secret information about enemies. The KGB was the main spying group for the Soviet Union. The British Secret Intelligence Service (also called MI6) and the U.S. Central Intelligence Agency (CIA) are still active today.

► **More to explore**
War

Squanto

Squanto was a Native American who helped the Pilgrims of Plymouth Colony. He belonged to the Pawtuxet tribe of Massachusetts and Rhode Island.



Squanto served as a guide for the Pilgrims, who were unfamiliar with the land.

Little is known about Squanto's early life. According to one story, explorers took Squanto to England in 1605. Captain John Smith brought him back to North America nine years later. Then one of Smith's men kidnapped Squanto and sold him into slavery in Spain. Squanto escaped to England. Upon returning to North America, he found that disease had killed the other Pawtuxet. Squanto went to live with the Wampanoag.

Squanto met the Pilgrims in 1621. Their settlement was on Wampanoag land. Squanto could talk to the Pilgrims because he knew the English language. He showed them how to plant crops and where to fish. He also helped them work out a peace treaty with Massasoit, chief of the Wampanoag.

The governor of Plymouth Colony made Squanto his representative to the

Did You Know?

Nathan Hale was one of the first U.S. spies. He was caught and killed by the British during the American Revolution (1775–1783).

Indian groups. But Squanto sometimes abused his power. The Indians began to distrust him. In 1622 Squanto falsely told the colonists that Massasoit was planning to attack Plymouth. The Pilgrims found him out, but they let him stay in Plymouth and protected him from Massasoit. Squanto died in what is now Chatham, Massachusetts, in November 1622.

► More to explore

Native Americans • Plymouth Colony
• Wampanoag

Squash

Squashes are fruits that are grown throughout the world in all but the coldest climates. They are related to gourds, melons, and cucumbers. Some types of pumpkin are also called squashes.

Squashes grow on plants with large, dark green leaves. The trumpet-shaped flowers range in color from yellow to orange. The fruits can be round, oval, or shaped like a shell. Their color can be white,

yellow, orange, green, gray, or speckled or striped. The rind, or skin, can be smooth or covered with bumps.

Squashes are divided into summer squashes and winter squashes. Despite the names, both types grow throughout the year. Summer squashes typically grow on bushes. They are much softer than winter squashes. They contain soft seeds that can be eaten. Summer squashes must be eaten soon after they are picked. Zucchini and yellow squash are types of summer squash.

Winter squashes grow on long vines. They are usually much larger than summer squashes. They have a thick, hard rind and seeds that are not eaten. Winter squashes will last for months after being picked. Acorn and butternut squashes are types of winter squash.

Squashes are often cooked as side dishes or used in soups. Zucchini and other summer squashes can be added to breads or muffins. The flowers of squash plants are also sometimes eaten. Squashes are used as food for farm animals, too.

► More to explore

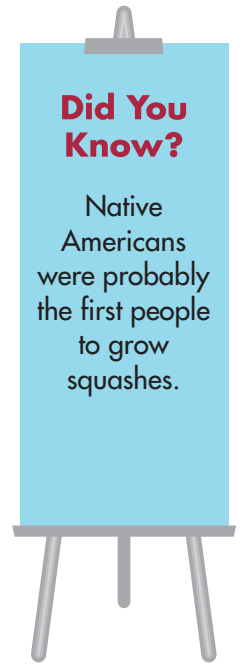
Fruit • Gourd • Pumpkin

Squid

Squid are mollusks that live in the ocean. Mollusks are a group of animals with soft bodies. Squid are closely related to octopuses, but they have 10 arms instead of 8. Squid can live either near the coast or in very deep water far out in the ocean.

Did You Know?

Native Americans were probably the first people to grow squashes.



Gardens produce many summer squashes.



The 10 arms of a reef squid are arranged in a circle around its mouth.

A squid has a long, tube-shaped body with a short head. A shell supports the body from the inside. Giant squid can be 60 feet (18 meters) long and weigh 1,000 pounds (454 kilograms). Some other squid are less than an inch (2.5 centimeters) long. A squid has large eyes, usually on the sides of its head. Two of a squid's 10 arms are longer than the others. Suckers on the long arms help the squid catch fish and shellfish to eat.

Squid can be fast swimmers, or they can just drift along. Whales, sea birds, and other animals eat squid. Squid often use their speed to escape enemies. They also can hide from enemies by changing color to blend in with rocks or seaweed. Like an octopus, a squid can spray a cloud of inky fluid into the water to confuse the enemy.

After mating, a female squid lays hundreds to thousands of eggs. The eggs are grouped together in jellylike strands. The female leaves the eggs

alone to develop. Within several weeks they hatch into a small form of the adult.

► More to explore

Mollusk • Octopus

Squirrel

Squirrels are rodents that have long bushy tails. In many cities squirrels are seen more often than any other wild mammal. The squirrel family also includes groundhogs, prairie dogs, and chipmunks. There are more than 250 different animals in the family.

Squirrels live on all continents except Australia and Antarctica. Tree squirrels make their homes in trees. Ground squirrels live in burrows, or holes, under prairies, deserts, and fields.



The Eurasian red squirrel is a common squirrel of Europe and Asia.

Squirrels are small. The African pygmy squirrels are the smallest. They are only about 4 inches (10 centimeters) long. The largest are the giant squirrels of Asia. They can be 36 inches (90 centimeters) long and weigh 6.5 pounds (3 kilograms). Most squirrels have large eyes and short fur.

Squirrels are known for their quick movements. Tree squirrels can make great leaps between branches. Flying squirrels can glide through the air by leaping and then spreading out the flaps of skin that connect their front and hind legs. The skin acts like a parachute. Some flying squirrels can glide almost 1,500 feet (450 meters).

Squirrels have four large front teeth. These teeth are used for gnawing. They grow throughout the animal's life. Squirrels eat mostly plants, including berries and tree bark. Most squirrels eat a lot of seeds and nuts. Tree squirrels bury nuts in the ground to eat later.

Most tree squirrels are active year-round. But many ground squirrels spend the winter in their burrows in a state of inactivity called hibernation.

Some squirrels are considered pests because they eat farm crops. Others carry diseases. Some squirrels are hunted for their fur. People also eat squirrel meat.

► More to explore

Chipmunk • Groundhog • Hibernation
• Prairie Dog • Rodent

Sri Jayewardenepura Kotte



Population
(2004 estimate)
120,800

Sri Jayewardenepura Kotte is one of the two capitals of Sri Lanka, an island country in the Indian Ocean. It is where Sri Lanka's lawmakers and highest court meet. It is a suburb of Colombo, Sri Lanka's other capital. The offices of the country's president and prime minister are in Colombo.

Sri Jayewardenepura Kotte was originally named Kotte. The city dates back to the 1300s. The rulers of the Sinhalese people built their capital at Kotte in 1415. In 1565 the Sinhalese moved their capital to Colombo.

Colombo later became the capital of Sri Lanka. In the 1980s the Sri Lankan government was running out of office space in Colombo. Officials then began developing Sri Jayewardenepura Kotte as another capital. Some of the government offices were moved there.

► More to explore

Colombo • Sri Lanka



Sri Lanka

The country of Sri Lanka occupies a pear-shaped island in the Indian Ocean. It was once a British colony known as Ceylon. Sri Lanka has two capitals, Colombo and Sri Jayewardenepura Kotte.

Geography

Sri Lanka lies about 18 miles (29 kilometers) from the southeastern tip of India. The waterway separating Sri Lanka from India is called the Palk Strait.

Flat or hilly plains make up most of Sri Lanka's land. There are high mountains and deep river valleys in the south-central part of the country. The longest river is the Mahaweli.

Because Sri Lanka is near the equator, it has warm weather year-round. The southwest receives heavy rainfall. The rest of the island is much drier.



The stilt fishers of Sri Lanka catch fish in shallow water while clinging to a pole.

Plants and Animals

The wet areas of Sri Lanka have tropical evergreen forests. Trees that shed their leaves grow in the drier regions. The driest areas have thorny shrubs and other plants that can survive without much water.

Leopards, bears, wild pigs, elephants, peacocks, and monkeys live in the forests. The government has created a number of national parks to protect the country's wildlife.

People

The Sinhalese people make up nearly three fourths of the population. They speak the Sinhala language and practice Buddhism. Tamils form the next-largest group. They speak Tamil, a language also spoken in southern India. The Tamils practice Hinduism, the main

religion of India. Muslims, who are also called Moors, make up Sri Lanka's third major group. They follow Islam and mostly speak Tamil. Many Sri Lankans also speak English. Most people live in villages.

Economy

Services—including telecommunications, insurance, and banking—have become key parts of Sri Lanka's economy. Manufacturing and mining are also important. Sri Lanka produces clothing, tea, rubber products, processed foods, tobacco, and chemicals. The country mines graphite (which is used to make pencils) and gems.

Many Sri Lankans grow rice and other crops to feed their families. Tea, rubber trees, and coconuts are grown on large farms called plantations.

History

The first people on the island were the Vedda. In about the 400s BC they began to mix with settlers from India. The

island's people came to be known as the Sinhalese. They later built an advanced Buddhist civilization. Beginning in the AD 900s Tamil invaders from India pushed the Sinhalese to the southwest. In the 1300s the Tamils set up a kingdom in the north.

European Control

The Portuguese arrived in 1505. By 1619 they controlled most of the island. The Dutch took over beginning in 1658. In the late 1700s the British took the island from the Dutch. The British called the island Ceylon. They grew coffee at first and then tea, rubber, and coconuts. Ceylon gained independence from Great Britain in 1948. The country adopted a new constitution in 1972 that changed the name to Sri Lanka.

Independence

The Sinhalese dominated the country's government. They supported the Sinhala language and Buddhism over other languages and religions. The island's Tamils soon wanted to set up a separate Tamil homeland in the northeast. In the 1980s heavy fighting broke out between Tamil groups and the Sri Lankan government. Tamil terrorist attacks continued into the 21st century.

In 2004 a tsunami, or huge wave, struck Sri Lanka. Tens of thousands of people were killed.

► More to explore

Buddhism • Colombo • Hinduism • Sri Jayewardenepura Kotte

Facts About SRI LANKA



Population
(2008 estimate)
19,394,000

Area
25,332 sq mi
(65,610 sq km)

Capitals
Colombo (executive), Sri Jayewardenepura Kotte (Colombo suburb; legislative and judicial)

Form of government
Republic

Major cities
Colombo, Dehiwala-Mount Lavinia, Moratuwa, Negombo, Sri Jayewardenepura Kotte



A woman picks tea leaves in Sri Lanka.

Stalin, Joseph



Joseph Stalin

Joseph Stalin led the country known as the Soviet Union for about 25 years. He made the Soviet Union into a world power, but he was known for his harsh rule.

Early Life

Joseph Stalin was born on December 21, 1879, in the country of Georgia. Georgia was then a part of Russia. Stalin's Georgian name was Ioseb Dzhughashvili.

As a young man Stalin became interested in Communism. Communists believe that all citizens should get an equal share of their country's wealth.

In 1903 the Communists of Russia split into two groups, Bolsheviks and Mensheviks. Stalin joined the Bolsheviks. Their leader was Vladimir Lenin. Stalin tried to get people to revolt against the Russian tsar. Because of this he was imprisoned several times.

Rise to Power

In 1912 Stalin became a party leader. By 1913 he was using the name of Stalin, which is based on the Russian word for "steel."

The Russian Revolution of 1917 brought down the Russian emperor. By 1921 the Bolsheviks, now known as the Communist Party, had all the power.

Lenin died in 1924. By then, the Communists had formed a new country called the Soviet Union. Party leaders fought for power, and Stalin came out on top.

Stalin wanted to make his country stronger and more modern. He built steel mills and factories. In 1928 he ordered small farms to be joined together. Farmers who resisted were shot or sent to punishment camps.

Starting in 1934, Stalin ordered his secret police to arrest and shoot many party members and army officers. He wanted to get rid of all possible threats to his power.

Later Years

In 1941 the Soviet Union entered World War II on the side of the Allies (including the United States and Great Britain). Soviet armies helped to win the war.

After the war Stalin turned against the Allies. His armies brought Communist rule to eastern European countries. Sta-

lin remained in power until his death on March 5, 1953.

► More to explore

Communism • Union of Soviet Socialist Republics • World War II

Stamp

Stamps are small, sticky labels sold by postal services. They are also called postage stamps. People buy stamps as a way to pay for the service of mailing a letter or package. They attach stamps to letters and packages before sending them. The postal service cancels, or marks, stamps before delivering the mail. The purpose of cancellation is to prevent people from using the same stamp a second time.

Kinds of Stamps

Postal services sell regular stamps in many different values—from 1 cent, for example, to 5 dollars or more. The more expensive stamps are used to pay for the



In 1918 the U.S. Post Office printed an airplane picture on a stamp upside down by mistake. It sold only 100 of these stamps. Today each one is worth thousands of dollars.

delivery of heavy packages or for speedy delivery.

Most countries also issue special stamps for limited periods of time. Some special stamps honor people and groups. Others call attention to important issues. Such stamps are often large and colorful.

Stamp Collecting

Some people collect stamps as a hobby. Stamp collecting is called philately. Stamp collectors, or philatelists, get stamps by soaking them off letters. They also buy stamps from the post office or shops. Collectors keep their stamps clean by using a tool called stamp tongs to handle them. They carefully place their stamps in books called albums.

Collectors learn how to identify rare and valuable stamps. Stamps that are worth thousands of dollars sometimes look almost exactly like other stamps that are worth only a few cents. One rare U.S. stamp that is easy to identify is a 24-cent airmail stamp of 1918. It was printed by mistake with the airplane upside down.

History

An English schoolteacher named Rowland Hill invented the postage stamp. The United Kingdom issued the first stamps in 1840. The first U.S. postage stamps appeared in 1847.

Early stamps were printed on sheets of paper with no easy way to separate them from each other. People had to cut the stamps apart with scissors. In the 1850s stamp makers started punching rows of

Did You Know?

The stamps of the United Kingdom always include a picture of the king or queen as part of the design.

holes called perforations between the stamps.

Until the late 20th century people licked stamps to make them sticky before attaching them to letters. Then postal services started making stamps that stuck without being licked.

► More to explore

Postal Service

Stanton, Elizabeth Cady



Elizabeth Cady Stanton

Elizabeth Cady Stanton helped to start the women's rights movement in the United States. She led the fight to give women the right to vote in elections.

Early Life

Elizabeth Cady was born in Johnstown, New York, on November 12, 1815. She was a good student, but she could not

go to college. Colleges did not accept women then. Instead, she attended Troy Female Seminary in New York. In 1840 she married a lawyer named Henry Stanton.

Career

Stanton thought it was unfair that women had fewer rights than men. In 1848 Stanton and her friend Lucretia Mott held a meeting in Seneca Falls, New York. It was the first women's rights meeting in the United States. Stanton helped to write a statement that called for many kinds of rights for women, especially voting rights.

After 1851 Stanton worked closely with another women's rights activist named Susan B. Anthony. Stanton and Anthony gave speeches, talked to politicians, and wrote books and pamphlets on women's rights.

After the American Civil War (1861–65), the 15th Amendment to the U.S. Constitution gave voting rights to men of all races. Stanton was angry that women were not included. She organized and led clubs for people who wanted voting rights for women.

Stanton had other interests besides voting rights. Women then found it hard to divorce their husbands. She wanted to make it easier. Married women also had to give everything they owned to their husbands. Stanton wanted married women to keep their own money and property.

Stanton died in New York City on October 26, 1902. Women in the United States gained the right to vote in 1920.

► More to explore

Anthony, Susan B. • Mott, Lucretia
• Voting • Women's Rights

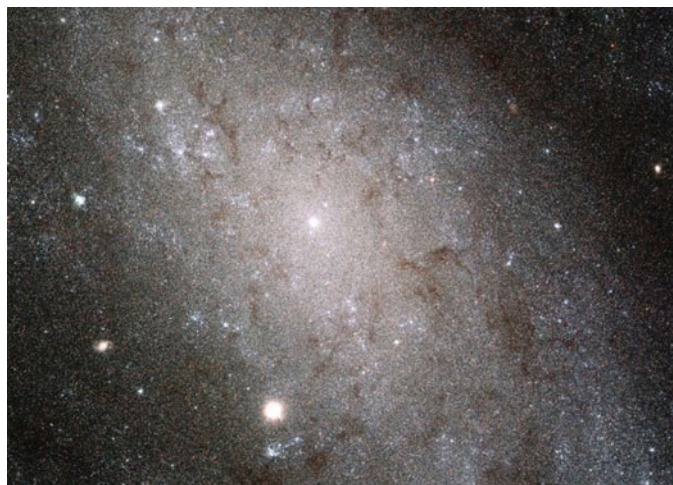
Star

Stars are huge, glowing balls of gases. The closest star to Earth is the sun. Most of the pinpricks of light that shine in the night sky are also stars. Countless more stars are too far from Earth to be seen without a telescope. Most stars are incredibly far away.

Stars are found in huge groups called galaxies. The sun and its solar system, including Earth, are part of the Milky Way galaxy. That galaxy alone contains hundreds of billions of stars. There are many billions of galaxies in the universe.

Source of Energy

Nearly all stars are made up mostly of a gas called hydrogen. A star's core is very

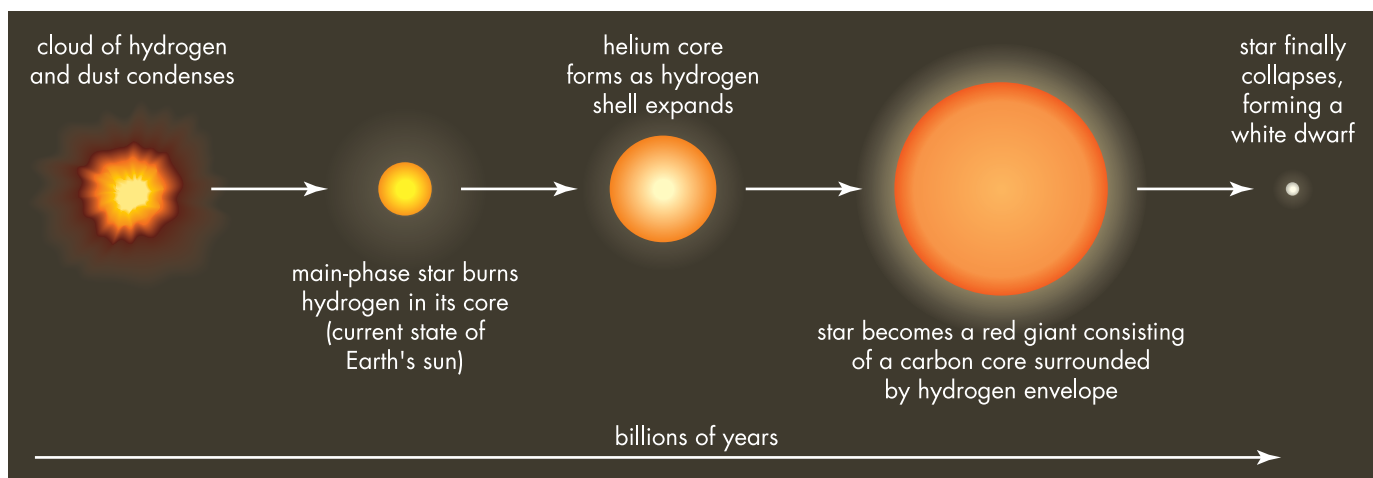


Stars are found in large groups called galaxies. A galaxy may contain millions or even hundreds of billions of stars, plus gas and dust.

hot. Great pressure squeezes the core, causing some of the hydrogen to change into a gas called helium. This process produces huge amounts of energy and makes the star shine.

Physical Features

Stars vary in size, temperature, brightness, and color. A star's temperature, as well as its chemicals, makes it shine in a certain color. The bluer stars are usually hotter, while the redder stars are cooler. The sun is somewhere in between. It



A time line shows the stages in the life of a medium-sized star.

Did You Know?

For thousands of years people have imagined that certain stars in the sky form outlines of pictures. These pictures are called constellations.

gives off yellow light. The sun is a fairly average star in terms of its brightness and size.

Life of a Star

Stars probably begin as clouds of hydrogen and dust. This material slowly pulls itself together into clumps. As the material gets packed in tighter, the clumps get hotter. Pressure builds up. Eventually the star begins changing hydrogen into helium—and so begins to shine brightly.

After shining for billions of years, a star uses up all its hydrogen. Small and medium-sized stars slowly cool down and stop shining. This will happen to the sun billions of years in the future.

Large stars end with a violent explosion called a supernova. After that the material gets crushed much smaller. It no longer shines. Huge stars may end up as objects called black holes. The crushed material is so heavy for its size that it develops a powerful inward pull. This pull, called gravity, is so strong that it sucks in anything that gets near the black hole.

► More to explore

Black Hole • Constellation • Energy
• Galaxy • Milky Way • Sun • Universe

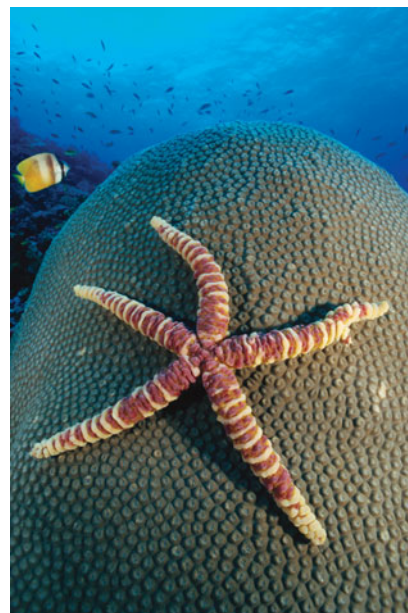
Starfish

Starfish are animals that live in all the world's oceans. They have five arms and look like stars. But they are not fish. Fish have backbones; starfish do not.

There are about 1,800 species, or kinds, of starfish. They can be brown, red, orange, pink, or other colors. Most starfish are 8 to 12 inches (20 to 30 centimeters) across. The body has a disk in the center with five or more arms attached. The disk and the arms are covered with short spines. Many starfish can grow another arm if they lose one.

A starfish moves using hundreds of tube feet on its underside. The tube feet are like little legs. In most starfish each tube foot has a suction cup on the end. These are good for creeping and clinging to steep surfaces.

Most starfish eat clams, oysters, and snails. They use their tube feet to pull apart the shells of larger prey. Some starfish sweep food into the mouth, which is on the underside of the body. Others turn the stomach outward to take in their prey. Certain starfish swallow the prey whole.



A starfish clings to a piece of coral in the ocean.

State Government

The United States has 50 state governments as well as a national government. This type of government system is called a federal system. Other countries that have a federal system include Australia, Canada, Germany, and Switzerland. These systems are different in some ways from the U.S. system. Some countries call their regions provinces or cantons instead of states. But there are many similarities. Each country's constitution gives its regions specific powers. The national government (also called the federal government) has other powers that apply to everyone in the country. Each region has its own executive (leader such as a governor), legislature, and court system. In addition, each region sends representatives to a national legislature.

The U.S. Federal System

The founders of the United States did not want a strong national government. But the first U.S. constitution, called the Articles of Confederation, made the government so weak that the country could not hold together. For this reason, the writers of the U.S. Constitution balanced power between a large central government and the smaller governments of the states.

The Constitution also balances power between large and small states. This is shown in the way the two houses of the U.S. Congress are organized. The more people a state has, the more members it



One role of the state governments in the United States is to issue license plates.

gets to send to the House of Representatives. This favors large states. But every state, whether large or small, gets to send two members to the Senate. This favors small states.

The U.S. Constitution lists certain things that state governments cannot do. For example, states must not make agreements called treaties with other countries. Apart from these few rules, state governments have much freedom. In fact, the 10th Amendment to the Constitution gives all powers to the states, except where the Constitution specifically says otherwise.

U.S. State Governments

U.S. state governments are organized much like the federal government. Every state has a constitution. Almost every state has a legislature with an upper house and a lower house. (Nebraska has a one-house legislature.) Every state has a governor who serves as the chief executive (president). Every state has a high



In the United States, state governments issue drivers' licenses. In most states, the Department of Motor Vehicles handles this task.

court, usually called the supreme court. The high court judges state laws in much the same way as the U.S. Supreme Court judges federal laws.

States also have the power to tax their people to pay for state programs. States pay for education and health care, as well as for the building of roads, bridges, and other projects.

States' Rights

State law may not go against federal law. Even so, U.S. states have sometimes claimed that a certain federal law did not apply to them. South Carolina tried to ignore a federal tax law in 1832. When President Andrew Jackson threatened to send in the army, the state backed down. Beginning in 1860, the Southern states claimed the right to

secede, or separate from the rest of the country, over the issue of slavery. This time they did not back down. The result was the American Civil War (1861–65), which is sometimes called the War Between the States. Since then the issue of states' rights has come up whenever a state disagrees with the federal government.

► More to explore

American Civil War • Government
• United States Constitution • United States Government

Statistics

Statistics is a branch of mathematics. It involves gathering information, summarizing it, and deciding what it means. The numbers that result from this work are also called statistics. They can help to predict such things as the weather and how sports teams will perform. They also can describe specific things about



A worker gathers information from a weather station. Such stations record many statistics, including temperatures, wind speeds, and rainfall amounts. Scientists can then study the statistics to learn about weather patterns in an area.

large groups of people—for example, the reading level of students, the opinions of voters, or the average weight of a city's residents.

Collecting Data

The people who gather statistics are called statisticians. They collect pieces of information, or data, in three basic ways. They refer to trustworthy sources, such as newspapers and reports from reliable organizations. They perform scientific experiments. They also conduct surveys, or ask people questions.

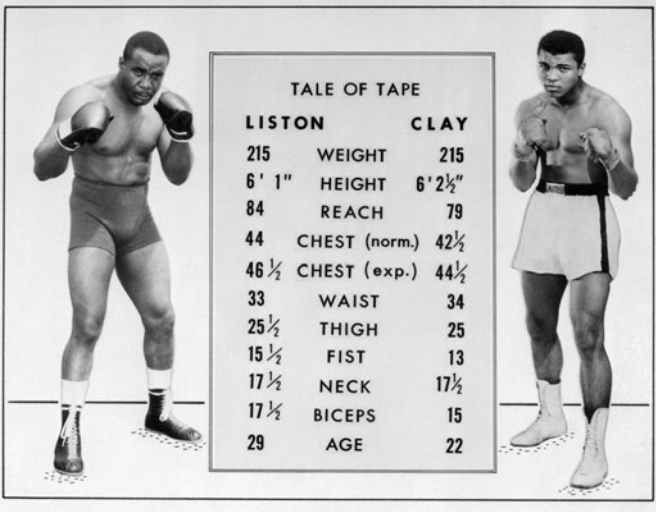
Sometimes statisticians cannot gather data about every member of a group, often because the group is too large. In such cases they study only part of the group, called a sample. A sample must accurately represent the larger population. For example, if women make up 60 percent of the population, then 60 percent of the sample must be women.

Summarizing Data

Once statisticians have collected their information, they summarize it. They often put the data in graphs or charts, which are easier to read than long lists of data.

Statisticians also summarize data by calculating numbers called averages. There are three kinds of averages: mean, mode, and median.

The mean is the sum of a set of numbers divided by the amount of numbers in the set. If 100 people weigh a total of



LISTON		CLAY
215	WEIGHT	215
6' 1"	HEIGHT	6' 2½"
84	REACH	79
44	CHEST (norm.)	42½
46½	CHEST (exp.)	44½
33	WAIST	34
25½	THIGH	25
15½	FIST	13
17½	NECK	17½
17½	BICEPS	15
29	AGE	22

Every sport has its own set of statistics for its athletes. Fans often use those statistics to compare the athletes.

1,500 pounds, then the mean weight is 1,500 pounds divided by 100, or 150 pounds. The mean is the most common kind of average.

The mode is simply the number that occurs most often in a sample. If the most common weight in a sample of people is 139 pounds, then the mode is 139. Modes also can describe information not made up of numbers—for example, letter grades.

The median is the number right in the middle of the sample. If the sample weights are 125, 130, 145, 150, and 160 pounds, then the median weight is 145 pounds. Medians are helpful when there are some unusually high or low numbers in the sample.

Using Statistics

Once the data are summarized, people interpret them, or decide what they mean. Newspaper articles, books, and

political speeches often include statistics. People use them to support their opinions.

Because statistics are represented by charts, graphs, and numbers, people tend to believe them. However, people can use statistics to twist the truth. It is important to know whether the statisticians collected the data carefully and summarized them accurately.

► More to explore

Graph • Mathematics • Numbers and Number Systems

Statue of Liberty

► see Liberty, Statue of.

Steel

Steel is a hard metal that people use to make many different products. Car bodies, bridges, building frames, and containers are just a few of the things made from steel.



Long sheets of steel are stored on rolls in a factory called a steel mill.

Steel is basically iron mixed with a little carbon. But steel is better than iron in many ways. Steel is stronger but lighter than iron. Steel also lasts longer than iron.

To make steel, workers heat iron until it melts. Then they add carbon to the liquid iron. They may also add other materials to make different types of steel. For example, steel with added chromium is called stainless steel. It will not rust or stain. Finally, workers use machines to cool the liquid steel into bars, slabs, or long sheets. The cooled, hardened steel may then be made into products.

People made the first steel as early as 1400 BC. Ancient people heated iron inside a pile of burning charcoal. This added carbon to the iron. The result was not the same as modern steel, but it was stronger than regular iron.

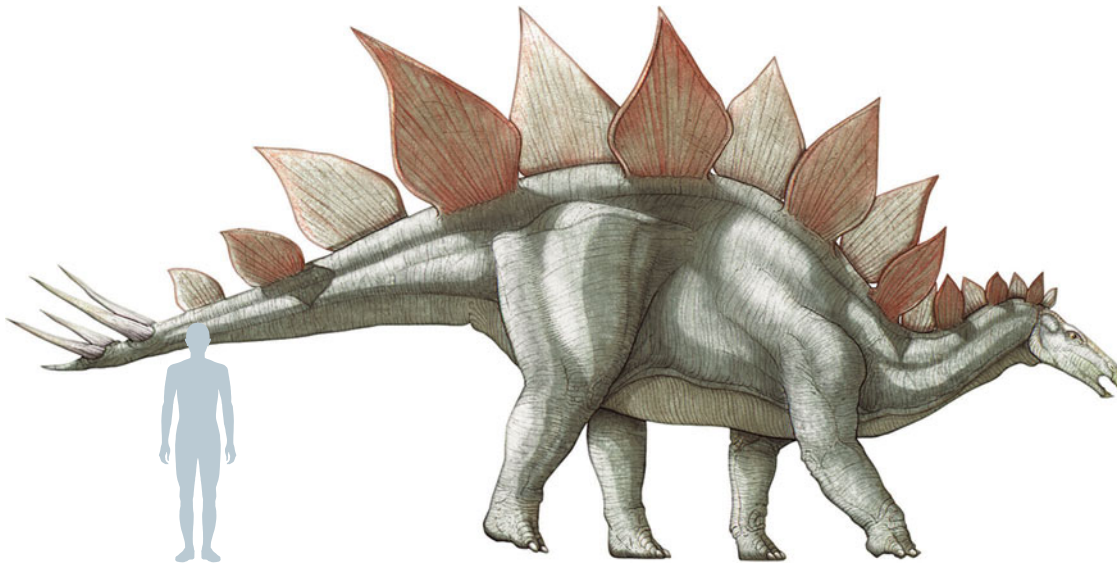
In the 1800s people began to use huge ovens to make large amounts of steel. In the late 1800s builders used steel to make some of the first skyscrapers. They also used steel to make large, modern bridges. In the 1900s new processes made steelmaking easier. Today steel remains one of the most popular building materials in the world.

► More to explore

Iron • Metal • Skyscraper

Stegosaurus

The name *Stegosaurus* means “covered lizard” or “roof lizard.” The dinosaur called *Stegosaurus* was given this name

*Stegosaurus*

because it had a row of enormous bony plates that ran along its back. *Stegosaurus* is the most familiar and the largest of the stegosaurs, or plated dinosaurs.

When and Where *Stegosaurus* Lived

Stegosaurus lived about 159 to 144 million years ago. Fossils, or remains, of *Stegosaurus* have been found in Colorado, Wyoming, Utah, and Oklahoma. *Stegosaurus* lived in wooded areas with low-growing types of plants.

Physical Features

Stegosaurus was a massive dinosaur that lumbered along on all four legs. It usually grew to a length of about 21 feet (6.5 meters). *Stegosaurus* measured about 10 feet (3 meters) tall at the hips and weighed about 2 tons. The huge plates that ran along its back from its neck to its tail stood in two staggered rows down either side of the backbone. Some of the plates were more than 2 feet (60 centimeters) tall. *Stegosaurus* also had two to

four pairs of spikes on its tail. The body of *Stegosaurus* had an arched appearance. Its back legs were longer than its front legs. *Stegosaurus* had a small, narrow head with a horn-covered beak.

Behavior

Stegosaurus was a plant eater. It used its spiked tail and large plates to defend itself. The plates contained blood vessels that may have helped control its body temperature as well. *Stegosaurus* most likely lived in herds.

► More to explore

Dinosaur

Stock Exchange

A stock exchange, or stock market, is a system for buying and selling securities, or stocks and bonds. A stock is a share in the ownership of a company. A bond is an agreement to lend money to a company for a certain amount of time. Companies sell securities to people to

get the money they need to grow. People buy securities as investments, or ways of possibly earning money.

Many countries have one or more stock exchanges. Some important exchanges are the New York Stock Exchange (in the United States), the London Stock Exchange (in England), and the Tokyo Stock Exchange (in Japan). These and other exchanges do much of their business in buildings. NASDAQ, in the United States, is an exchange that does its business electronically, or online.

How a Stock Exchange Works

A number of companies belong to each stock exchange. The companies sell securities to people. People then use the exchange to trade (sell and buy) the securities among themselves. The exchange lists the securities for sale and their prices. It also handles the transfer of securities between sellers and buyers.

The prices of different securities rise or fall, or both, throughout the day, every day the exchange is open. People make

money by selling securities at a higher price than they paid for them.

Rising and Falling Prices

Many factors affect the price of a company's securities. If a company is successful, the price of its stock usually will go up. The health of the economy, laws passed by the government, and wars also can cause securities' prices to rise or fall.

Even people's feelings can affect prices at a stock exchange. For example, if people fear that prices will go down, they may start selling their securities. But if many people sell large numbers of securities, they can actually make prices go down. If widespread selling continues, a stock market crash can happen. A crash means that the prices have fallen so low that very few people are willing to buy securities. As a result, the people who own the securities have little chance of getting their money back.

Crash of 1929

A famous stock market crash happened in the United States in October 1929. Over several days panicked investors sold so many shares of stock that the market collapsed. Almost every part of the economy suffered. Farmers could not sell their crops, banks and businesses closed, and wages fell to very low levels. This period of hardship lasted about 10 years. It became known as the Great Depression.

► More to explore

Economics • Great Depression • Trade



The New York Stock Exchange quiets down after a busy day of trading.

Stockholm



Population
(2008 estimate)
795,160

Stockholm is the capital of Sweden, a country in northern Europe. It is Sweden's largest city. It is also the country's center of government, culture, education, and business.

Stockholm is known for its natural beauty. It is located where Lake Mälaren meets the Baltic Sea. The city is built on many small islands as well as on the Swedish mainland. Bridges connect the different parts of the city.

The economy of Stockholm is based mostly on industries that provide services and on government. The city is a center for banking, health care, education, and research. Several companies in Stockholm develop technology for computers and wireless communications equipment. Other companies develop technology to make the environment cleaner. Shipping goods through Stockholm's port is also an important industry. Passenger ships use the port, too.

A Swedish ruler named Birger Jarl is said to have founded Stockholm in about 1250. The city grew into an important center of international trade.



Riddar Island is part of the oldest area in Stockholm, Sweden. It is known for its historic sites and architecture.

For many years Denmark and Sweden fought for control of Stockholm. In 1523 Gustav Vasa captured the city for Sweden. Stockholm became the official capital of Sweden in 1634.

Stockholm developed rapidly in the middle of the 1600s. By the 1700s it was a major center of the arts and sciences. In the 1800s many streets, parks, and buildings were constructed in Stockholm. In the late 20th century several new suburbs were created.

► More to explore

Sweden

Stomach

The stomach is a hollow organ that is a part of the digestive system. Food lands in the stomach after passing down the throat through a tube called the esophagus. The stomach stores food and passes it along in small amounts to the intestines.

The Human Stomach

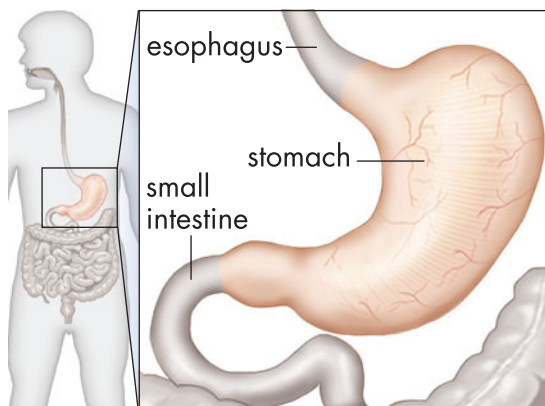
The human stomach is located in the upper left side of the belly. An adult's stomach is about 10 inches (25 centimeters) long. It can expand to hold as much as 1 quart (0.9 liter) of food.

Glands in the stomach produce gastric juices. These juices partly break down food. A lining of mucus protects the inside of the stomach from the gastric juices.

Stomach muscles mix food and gastric juices together. They also move the food toward the small intestine. Food may remain in the stomach from about one hour to more than five hours, depending on the type of food. Fats remain in the stomach much longer than starches and sugars do. After the stomach empties, the stomach muscles continue to move. This causes hunger pangs.

Stomachs of Other Animals

The stomachs of some animals have more than one chamber, or section. Each chamber has its own job. Cows



The stomach is one of the main organs of the human digestive system. It is connected to the esophagus at one end and the small intestine at the other end.

and other animals that eat grassy food have four separate chambers in their stomachs. Birds have three chambers.

► More to explore

Digestive System • Food and Nutrition
• Intestines

Stone Age

The Stone Age was a time in prehistory when humans made and used stone tools. (Prehistory is the time before people invented writing.) Early humans began using stones as simple tools about 2 million years ago. Humans used mainly stone tools until about 10,000 years ago. However, the Stone Age began and ended at different times in various parts of the world.

Scientists divide the Stone Age into two main periods: the Paleolithic Period and the Neolithic Period. Sometimes scientists put another period, called the Mesolithic, in between these two.

Paleolithic Period

Paleolithic means “old stone age.” At the beginning of the Paleolithic Period, early humans made chopping tools out of stones. These tools did not change much for thousands of years. Then humans learned to chip flakes off stone. With this method they made better tools, such as scrapers and chisels. By about 40,000 years ago humans were attaching stone blades to handles made of bone or antler.

Some Paleolithic people lived in caves. Others lived under rock overhangs or

How Stone Age Humans Made Hand Axes



out in the open. They gathered wild plants to eat. Their tools helped them to hunt animals. Groups moved with the seasons to find food. In the later Paleolithic Period some groups made small sculptures out of clay, stone, or bone. Some groups painted or carved designs on rocks or cave walls.

Neolithic Period

Neolithic means “new stone age.” The Neolithic Period began about 10,000 years ago. During this period people ground and polished stone to make more useful tools. They also learned to grow crops and to tame animals. They began to settle in villages. They learned to make pottery and to weave cloth and baskets.

The Neolithic way of life first appeared in southwestern Asia. Over several thousand years it spread northward to Europe and eastward to India and East Asia. People in the Americas developed Neolithic skills on their own. By about 6500 BC North Americans were growing corn, beans, and squash.

End of the Stone Age

By about 5,000 years ago people in Greece and China were making tools from bronze (a mixture of copper and tin). This development marked the end of the Stone Age and the beginning of the Bronze Age. The Bronze Age began later in other parts of the world. Some places never had a Bronze Age. In the Americas, for example, the development

of agriculture and towns brought an end to the Stone Age.

► **More to explore**

Bronze Age • Cave • Human Origins
• Prehistoric Life

Stonehenge

Stonehenge is a circular group of huge stone blocks in southern England. It is located near the city of Salisbury in the county of Wiltshire. People built Stonehenge in stages between 5,000 and 3,500 years ago. No one knows for sure why Stonehenge was built. Many scholars think that it was a place of religious worship.

Today only ruins of Stonehenge are still standing. Hundreds of years ago builders took many of the stones for use in other places. Other stones have fallen down. But the ruins still give an idea of what Stonehenge looked like in prehistoric times.



A view from above the ruins of Stonehenge shows the arrangement of its ancient stones. In many ways, Stonehenge is still a mystery to modern scientists and historians.

The largest stones were arranged in two groups. One was a circle of flat stones that rested on other stones that stood upright. The other group was inside the circle. It was a horseshoe-shaped group of five pairs of upright stones, with a flat stone on top of each pair. These stones weighed as much as 50 tons each.

Stonehenge also included smaller stones that weighed up to 4 tons each. Some of these stones had to be moved 240 miles (385 kilometers) from the place where they were mined. No one knows how this was done.

A straight path called the Avenue led away from the circles. An upright stone called the Heel Stone still stands near the center of the Avenue. On the longest day of the year (usually June 21), a person standing in the center of the stone circle can see the sun rise directly above the Heel Stone. This has led some archaeologists (people who study things made by ancient people) to guess that Stonehenge was built by people who worshipped the sun.

► **More to explore**

Archaeology • England

Stonies

► see Assiniboin.

Stork

Storks are large birds with long legs, necks, and bills. They are wading birds, which means they typically walk or

stand in shallow water while feeding. There are 17 species, or types, of stork. The most famous type is the white stork. In some European countries it is said to bring good luck. Storks are related to herons, ibises, flamingos, and New World vultures.

Most storks live in warm regions in Africa, Asia, and Europe. They can also be found in the Americas and Australia. The only stork commonly seen in the United States is the wood stork. It breeds in the Southeast and sometimes wanders farther north. Storks tend to live near water, but they can also be found on dry ground. The white stork is known for nesting on rooftops and chimneys in towns.

Storks usually stand about 2 to 5 feet (0.6 to 1.5 meters) tall. The largest stork is the marabou of Africa. Storks commonly have black and white feathers. Some species have no feathers on the head and neck, only red, pink, or black skin.

Most storks eat insects, frogs, fish, and other small animals. They catch their food in fields or shallow waters. The marabou and a type called the adjutant stork feed on carrion, or dead animals.

The stories about storks bringing good luck have led many people to treat the birds well. In some places, however, storks have been hunted and killed for food or for their feathers.

► More to explore

Bird • Flamingo • Heron • Ibis • Vulture



African wood storks stand by a lake in Kenya.

Storm

A storm is a disturbance in the atmosphere, or air. Thunderstorms, tornadoes, and tropical cyclones are powerful and sometimes dangerous types of storms. People also use the word storm to describe strong winds or other forms of severe weather.

Thunderstorms

Thunderstorms include thick clouds, heavy rain or hail, lightning, thunder, and strong winds. Thunderstorms happen when hot, moist air rises quickly to cooler parts of the atmosphere. There the air cools, and clouds and rain form. Lightning, which is a form of electricity, develops inside the clouds. As the lightning heats the air, it causes it to expand. This causes the sound of thunder. Meanwhile, cooled air sinks toward the ground. This movement of air causes heavy winds.



A tornado travels across open land in the U.S. state of New Mexico. Tornadoes can produce the strongest winds found on Earth.

Hailstorms

During a hailstorm balls of ice called hail fall to the ground. Hailstorms often happen during thunderstorms. As rain falls, it pulls air down with it. The downward draft of air may turn upward again. This causes the rain to churn around in the clouds. Some of the rain may freeze to form hail. The hail grows so heavy that it falls to the ground. Pellets of hail are usually 0.2 to 4 inches (5 millimeters to 10 centimeters) across.

Tornadoes

Tornadoes sometimes develop during thunderstorms. A tornado is a column of strongly rotating winds. It may be shaped like a funnel or a pillar. The column reaches down from a cloud to touch the ground. It then moves along the ground at about 28 miles (45 kilometers) an hour. The speed of a tornado's winds may be 300 miles (482 kilometers) an hour. They can destroy buildings and throw heavy objects high into the air.

Cyclones

A cyclone is a large system of winds that blow in a spiral around a central area. Cyclones that form over warm oceans are called tropical cyclones. In the Atlantic Ocean these cyclones are known as hurricanes. In the western Pacific Ocean they are called typhoons. The winds of a tropical cyclone may blow faster than 74 miles (119 kilometers) an hour. The swift winds often bring heavy rain and destruction to coastlines. The center of a tropical cyclone is known as the eye. The weather inside the eye is calm.

Windstorms

Windstorms are dry storms marked by winds with a speed of 73 miles (117 kilometers) an hour or more. Windstorms bring no rain or snow. However, they may pick up large amounts of dust or sand from the ground. During such a windstorm—called a dust storm or a



A woman shovels snow off her car after a blizzard. Severe snowstorms can make getting around by car difficult and often dangerous.

sandstorm—the dust or sand flying through the air can make it difficult to see. Sandstorms are common in deserts.

Snowstorms

Snowstorms feature low temperatures, strong winds, and a lot of snow. Particularly strong snowstorms are called blizzards. A severe blizzard has winds of more than 45 miles (72 kilometers) an hour, visibility near zero, and temperatures of 10° F (–12° C) or lower.

► More to explore

Atmosphere • Rain • Weather • Wind

Storytelling

Storytelling has captured the human imagination for thousands of years. People everywhere have told stories to amuse, to teach, to remember, and just to pass the time. People started telling stories long before writing was invented. Today stories are also written down in books of fiction and acted out in movies, television shows, and plays. But people all over the world still tell one another stories out loud. A person who can tell a good story nearly always finds an audience.

The Oral Tradition

Before people developed writing, storytelling was the most important way to pass along information. Anything a culture wanted to preserve—its beliefs, its history, and its traditions—had to be told out loud. Each generation would tell the culture's stories to the next generation. In this way the stories were



Many public libraries and museums invite storytellers to entertain children with their tales.

passed along. Knowledge passed on in this method is called the oral, or spoken, tradition. Even cultures that know how to write still pass along some information in this way.

In some cultures everyone would pass along the stories. In other cultures only special storytellers were entrusted with this important job. A culture's best storytellers had good memories. They could also make the tales very entertaining. This helped ensure that people would listen to their stories and remember them. Sometimes people would sing the stories or tell them in the form of poetry. Melody, rhythm, and rhyme can all make stories easier to remember.

Nevertheless, stories told aloud change over time as different people tell them. A storyteller might change a story on purpose to make it better. Or a teller may simply not remember all of a tale accurately. Unlike written literature, the oral tradition is not created by any one person. Instead an entire culture helps

shape the changing stories across generations. Sometimes the stories are collected and written down long after they have been created.

Types of Stories

Since ancient times stories have taken many different forms. Cultures all over the world tell traditional stories about their gods and beliefs about life. These legends, called myths, are related to religion. Creation myths explain how a culture believes, or once believed, the world began. Other myths may explain how people were created, why it rains, or why there is evil in the world.

Folktales are another form of story common to all cultures. They can be very similar to myths. Folktales take many forms. They may be funny, scary, or tell of exciting adventures. Some folktales tell about strong heroes. Other folktales feature clever “tricksters” who fool other characters. Other tales tell of witches, thieves, ghosts, cowboys, talking animals, or common villagers.



A storyteller sings tales about Australia with a group of students. Singing a story makes it easy to remember as well as fun to tell and listen to.

Fables, fairy tales, and nursery rhymes are common types of folk stories. A fable is a short folktale that teaches a lesson about how people should behave. It usually has animal characters that speak and act like people. Fairy tales tell about magical beings such as fairies, elves, dragons, and trolls. Nursery rhymes tell entertaining stories in short, clever poems. People have told such stories to children for centuries.

► More to explore

Fiction • Folktale • Literature
• Mythology • Nursery Rhyme • Poetry

Stowe, Harriet Beecher

Harriet Beecher Stowe wrote a famous book called *Uncle Tom's Cabin* about the difficult lives of slaves in the United States. At the time, people argued over whether or not slavery should be allowed. Stowe worked to end slavery.

Harriet Beecher was born on June 14, 1811, in Litchfield, Connecticut. Her father was a preacher who did not believe in slavery. The Beechers moved to Cincinnati, Ohio, in 1832. In Cincinnati, Harriet married Calvin Stowe.

While living in Cincinnati, Stowe learned more about slavery. She found out that her servant was a runaway slave. Stowe and her husband helped the servant escape through the Underground Railroad. This was a secret route that helped runaway slaves escape to Canada.



Harriet Beecher Stowe

from the Southern states. Stowe also started writing articles and stories.

In 1852 Harriet published her most famous book. *Uncle Tom's Cabin* was a book about slave families. It described the horrors slaves faced. Many people say that *Uncle Tom's Cabin* helped bring about the American Civil War. One of the main reasons for the war between the Northern and Southern states was that people did not agree about slavery. Some people in the Northern states wanted slavery to be ended throughout the United States. The Southern states wanted to keep slavery. During the war Stowe met President Abraham Lincoln. He told her that he knew her book had influenced many people.

Harriet Beecher Stowe's career as a writer lasted more than 50 years. By the end of her life, Stowe had written more

than 30 books and many articles. Stowe died in Hartford, Connecticut, in 1896.

► More to explore

American Civil War • Slavery
• Underground Railroad

Strawberry

Strawberries are red, heart-shaped fruits. They are eaten fresh, often with cream. They are also used as a filling for pastries, pies, and cakes. Strawberries are rich in vitamin C, and they also contain iron and other minerals.

Strawberry plants grow in mild regions all over the world. The United States and Canada are leading producers of strawberries. Many countries have developed their own strawberry varieties to suit their climate.

Strawberry plants grow close to the ground. At the top of the plant is the crown, from which the leaves sprout.



Flowers and strawberries grow on a strawberry plant.

The leaves have three hairy parts with jagged edges. White flowers grow in small groups on slender stalks. As the plant gets older, the crown sends out vines that spread over the ground.

Botanists (people who study plants) do not consider strawberries to be true berries. A true berry, such as a blueberry, is a single fruit that forms from a single flower. Strawberries are actually groups of small fruits that form from a single flower.

Strawberries need to be stored in a cool and dry place after they have been picked. But they still do not stay fresh for very long. Some are frozen or canned to make them last longer.

► **More to explore**

Berry • Fruit

Strep Throat

Strep throat is an infection of the throat caused by bacteria (germs) called streptococci. Anyone can get strep throat, but the illness is most common in children.



A doctor checks a girl's throat for signs of strep throat.

People develop strep throat between two and five days after coming into contact with the bacteria. The illness usually begins suddenly, with a fever. Other symptoms, or signs, include a severe sore throat, chills, and problems swallowing. There also may be thick white or yellow spots at the back of the throat.

Streptococci live in the nose and throat of an infected person. Sneezing, coughing, sharing dishes, and touching can pass the bacteria to others. Washing hands often may help to prevent the spread of streptococci.

Doctors check for strep throat by swabbing the back of the throat, or wiping it with a special stick. The stick is then tested for the presence of bacteria. Doctors treat strep throat with medicines called antibiotics, which kill bacteria. If strep throat is not treated, it can lead to scarlet fever or a more serious disease called rheumatic fever.

► **More to explore**

Antibiotic • Bacteria • Scarlet Fever

Submarine

A submarine is a vessel, or ship, that can go underwater. Submarines are called subs for short. Militaries and scientists use submarines to travel deep under the ocean.

Militaries use submarines to patrol ocean waters and to attack enemy ships during wartime. Military submarines are usually very large. They may carry more



A nuclear-powered U.S. submarine runs on the surface of the water. The upright structure on the submarine is called the conning tower.

than 100 people. They have separate rooms for working, eating, and sleeping. They also carry such weapons as missiles and torpedoes.

Scientific researchers and explorers usually use smaller submarines. These submarines may have mechanical arms, cameras, and other tools to help scientists study the underwater world.

Parts of a Submarine

A submarine has huge tanks, called ballast tanks, that allow it to dive and to surface. The tanks fill with water to give the submarine the weight it needs to sink. When the submarine is ready to surface, the ballast tanks release the water and fill with air. This lightens the vessel enough for it to float.

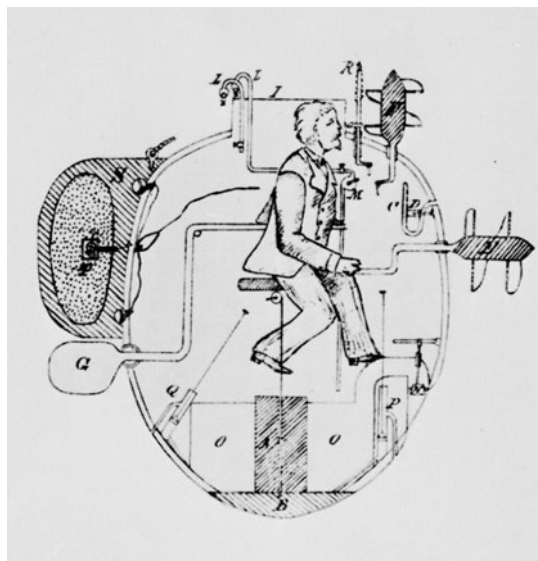
For power, submarines use engines, batteries, nuclear power sources, or a combination of these. Propellers push submarines through the water.

A submarine's crew uses complex equipment to find the way through deep, dark oceans. To find enemy submarines or other targets, submarines may use sonar. Sonar equipment locates objects by picking up sound waves. Other onboard equipment provides clean air and fresh water to the crew.

History

A Dutch inventor named Cornelis Drebbel built the first working submarine in 1620. It was a leather-covered rowboat that could reach a depth of 15 feet (4.5 meters).

The U.S. inventor David Bushnell built a submarine that he ran in 1776 during the American Revolution. In 1800 the famous U.S. inventor Robert Fulton built the *Nautilus*. This was a small submarine that could attach explosives to ships.



David Bushnell built a submarine for the United States during the American Revolution (1775–83). The operator ran it by turning a crank that was attached to a propeller.

Other inventors experimented with gas-, steam-, and battery-powered submarines. By the early 1900s submarines had both a diesel engine (a type of internal-combustion engine) and battery-powered electric motors. The diesel engine ran the submarine on the surface. The electric motors ran it underwater. Militaries used these diesel-electric submarines in World War I (1914–18) and World War II (1939–45).

The U.S. Navy introduced the first nuclear-powered submarine in 1954. It was named the USS *Nautilus*. Nuclear submarines need only a small amount of fuel to produce a lot of power. This means that they can stay underwater for an almost unlimited length of time.

► More to explore

Ship • War • World War I

Sucre



Population
(2001 census)
193,873

Sucre is one of the two capitals of Bolivia, a country in South America. Sucre is Bolivia's judicial, or legal, capital. The country's Supreme Court meets there. Bolivia's lawmakers and president work in La Paz, the administrative capital.



Cafés line a street in Sucre, Bolivia.

Many people in Sucre work in trade, education, or other service industries. Factories in the city process oil, cement, and foods.

Sucre began as a Charcas Indian village. The Spanish took over the area in the early 1500s. In 1539 the Spanish founded the city of La Plata at the site of the Indian village. The city was also called Charcas or Chuquisaca.

The people of La Plata started a revolt against Spanish rule in 1809. In 1825 Bolivia became an independent country. La Plata became the capital of Bolivia in 1839. The next year it was renamed Sucre after the Bolivian leader Antonio José de Sucre.

In 1898 different groups based in Sucre and La Paz fought for power. They solved their differences by splitting power between the two cities. La Paz became Bolivia's administrative capital. Sucre remained the judicial capital.

► More to explore

Bolivia • La Paz

Sudan

Sudan is the largest country in Africa. It is divided into northern and southern regions. Different groups of people live in the two regions, and this has sometimes led to fighting. The capital of Sudan is Khartoum.

Geography

Sudan covers a large area in northeastern Africa. It shares borders with Eritrea, Ethiopia, Kenya, Uganda, the Democratic Republic of the Congo, the Central African Republic, Chad, Libya, and Egypt. In the east Sudan has a coast along the Red Sea.

Northern Sudan is in the Sahara Desert. Southern and central Sudan have enormous swamps and some mountains. The Nile River flows south to north through the middle of the country. Its two major branches, the White Nile and the Blue Nile, join at the city of Khartoum.

Sudan is a hot country. The north gets almost no rain, while the south has a long rainy season.

Plants and Animals

The northern desert has few plants. Shrubs and grasses grow in central Sudan. Tropical rain forests exist in the far south.

Sudan's wildlife includes lions, leopards, cheetahs, crocodiles, elephants, antelope, giraffes, zebras, chimpanzees, rhinoceroses, and hippopotamuses. These animals live mainly in the south.

People

The name Sudan comes from Arab words meaning "land of the blacks." However, about half of Sudan's people are Arabs. They follow Islam and live mainly in northern and central Sudan. Most of Sudan's black Africans live in the south. They follow Christianity or traditional African religions. Arabic and English are common languages, but Sudan's peoples speak more than 100 other languages. Most people live in the countryside.

Economy

Most of Sudan's people work as farmers. The land between the two branches of the Nile is the country's main growing region. Farmers grow sorghum, millet, sugarcane, peanuts, sesame seeds, cotton, and other crops. They raise sheep, goats, cattle, and camels.





A village sits close to a branch of the Nile River in southern Sudan.

Sudan began selling petroleum (oil) to other countries in 1999. Its factories produce sugar, cement, vegetable oil, shoes, and other goods. Services such as transportation and communications are also important to the economy.

Facts About SUDAN



Population
(2008 estimate)
39,445,000

Area
966,757 sq mi
(2,503,890 sq km)

Capitals
Khartoum (executive); Omdurman (legislative)

Form of government
Military regime

Major cities
Omdurman, Khartoum, Khartoum North, Port Sudan, Kassala

History

People have lived on the land that is now Sudan for tens of thousands of years. In ancient times the northern part of Sudan was known as Nubia. Ancient Egypt sometimes ruled Nubia. From the 1000s BC to the AD 300s Nubia was part of the kingdom of Kush (or Cush).

After Kush lost power, three kingdoms rose up in Sudan. They converted to Christianity in the 500s. These kingdoms reached the height of their power in the 800s and 900s. They collapsed between the 1200s and the 1400s, when Arabs from Egypt moved into northern Sudan.

Egypt conquered all of Sudan in 1874. The Egyptians had British governors

rule the territory. Sudan's Muslims revolted against the British and took control of the region in 1885. The British regained control in 1898. Great Britain and Egypt then ruled Sudan until 1956. That year Sudan became independent.

Military governments, led by Muslims of the north, soon came to power. The non-Muslim peoples of the south fought against the governments. The civil war led to famines and forced millions of people to leave the country. A peace agreement was signed in 2005.

Meanwhile, in 2003, fighting broke out between armed Arab groups called militias and non-Arab Muslims in the region called Darfur, in western Sudan. Sudan's government supported the militias. Tens of thousands of people were killed, and hundreds of thousands were forced from their homes.

► More to explore

Khartoum • Kush • Nile River • Nubia • Sahara



A Sudanese man herds his cattle through a forest.

Suez Canal



The Suez Canal is a waterway that links the Mediterranean Sea and the Red Sea. It separates the continents of Africa and Asia. It cuts thousands of miles from the routes of ships traveling between Europe and Asia.

The Suez Canal is in Egypt. It extends 101 miles (163 kilometers) through a narrow piece of land called the Isthmus of Suez. Port Said, a city on the Mediterranean Sea, is at the northern end. The port city of Suez is at the southern end. It lies on the Gulf of Suez, a part of the Red Sea. From the Red Sea, ships can reach the Indian Ocean.

Before the Suez Canal was built, ships sailing between the Mediterranean Sea and the Indian Ocean had to sail all the way around the southern tip of Africa. The canal allows ships to pass directly between the Mediterranean and the Indian Ocean. Before the canal, the voyage from London, England, to Mumbai (Bombay), India, was 12,400 miles (19,950 kilometers). The canal shortened the trip to 7,250 miles (11,670 kilometers).

A French-owned company built the Suez Canal between 1859 and 1869. For many years France and Great Britain together owned the canal. They agreed that the canal should be open to ships of all countries in times of both peace and war. But in 1956 Egypt took over the canal. France and Britain, helped by Israel, tried to take back the canal by force. They failed. War between Egypt and Israel closed the canal between 1967 and 1975. Today the canal is one of the world's busiest shipping routes.

► More to explore

Egypt • Mediterranean Sea • Red Sea

Sugar

Sugar is the most widely used sweetener in the world. It makes things such as



The first step in making sugar from sugarcane is to chop the stalks into short lengths.

candy and soda taste good. The sugar most people use is called sucrose.

Sucrose is found in almost all plants. Sugarcane and sugar beets are the best producers of sucrose. Most of the world's sugar comes from them. Sugarcane is a giant, thick grass. Major producers of sugarcane include Brazil, India, and China. The sugar beet is a type of beet. Sugar is stored in its white root. France and Germany are leading producers of sugar beets.

Sugar is made from the juice of these plants. The juice is boiled until it starts to thicken and sugar crystals begin to form. The crystals are then removed. What is left is a syrup called molasses. The sugar crystals go through several more steps, including washing. They are then packaged and sold around the world.



Wet sugar crystals pour out of machinery in a factory. The sugar is ready to be dried, packaged, and shipped to users.

Slight differences in the process can produce other kinds of sugar. For example, a bit of the molasses is left on sugar to create brown sugar.

Doctors tell people to watch how much sugar they eat. Kids who eat lots of sugar may have trouble settling down. This is known as being hyperactive. Too much sugar can cause people to gain weight. It also can lead to tooth decay.

Today some people use artificial sweeteners—such as saccharin and aspartame—instead of sugar. These sweeteners are especially popular with people who are trying to lose weight. However, some doctors think that certain artificial sweeteners are not safe.

► More to explore

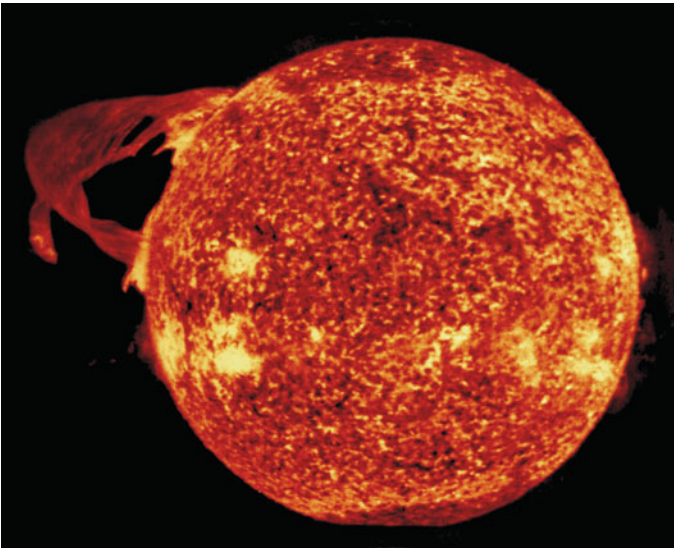
Beet • Crystal • Grass

Sun

The sun is the star at the center of the solar system. It is a hot ball of gases that gives off great amounts of energy. Life on Earth depends on light and heat from the sun.

The sun is about 93 million miles (150 million kilometers) away from Earth. The next-closest star to Earth is about 250,000 times farther away. That is why the sun is by far the brightest object in the sky.

The sun is the largest object by far in the solar system. Its diameter, or distance through its center, is about 865,000 miles (1,392,000 kilometers). This is



U.S. astronauts took a photograph from space of a huge flare of energy on the sun.

about 109 times bigger than Earth's diameter.

The Sun's "Furnace"

The sun consists mostly of the gases hydrogen and helium. Its core is very hot, probably reaching about 28,080,000° F (15,600,000° C). The hydrogen is packed in tightly at the core. Great pressure squeezes the hydrogen, causing it to change into helium. This process releases huge amounts of energy. Every second the sun changes, or "burns," more than 600 million tons of hydrogen fuel into helium.

The sun has been shining for at least 4 billion years. It is now mostly hydrogen with some helium. Billions of years in the future, the sun will use up all its hydrogen fuel. Eventually it will stop shining.

Surface and Atmosphere

Like the core, the surface of the sun is made of gases. The surface temperature

is about 10,000° F (6,000° C). Sometimes cooler, darker patches called sunspots appear on the surface. Sunspots appear and disappear in 11-year cycles.

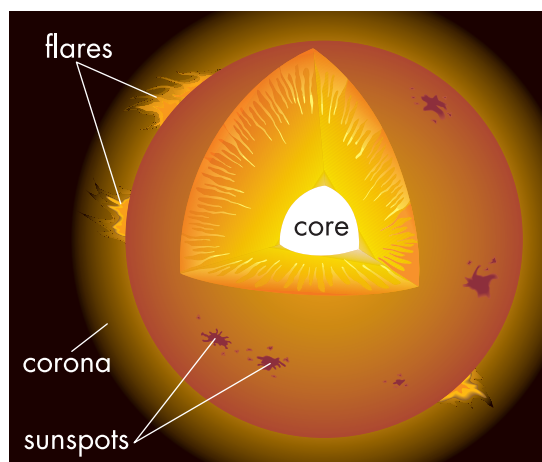
Layers of gases, called an atmosphere, surround the sun. Sometimes great blasts of energy, called solar flares, erupt from the inner atmosphere. The outer atmosphere is called the corona. It is very hot, reaching 3,600,000° F (2,000,000° C).

The Solar Wind

The sun's corona shoots out streams of tiny particles that carry an electric charge. These streams are called the solar wind. The solar wind moves through the solar system at about 250 miles (400 kilometers) per second. It can disrupt radio signals on Earth. It also causes colorful bands of light called auroras to appear in the sky in Earth's far north and south.

► More to explore

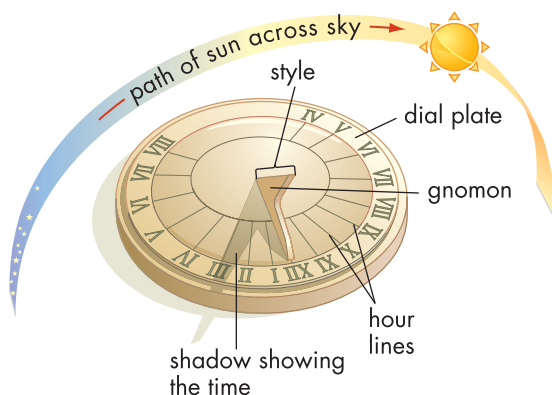
Aurora • Energy • Solar System • Star



A cutaway view shows the extremely hot core of the sun. Sunspots dot the surface, and flares burst from the inner atmosphere. The corona is the sun's outer atmosphere.

Sundial

Sundials are the oldest known instruments for telling time. The surface of a sundial has markings for each hour of daylight. As the sun moves across the sky, another part of the sundial casts a shadow on these markings. The position of the shadow shows what time it is.



Before the invention of the clock, many cultures around the world used sundials to tell time.

The flat surface of a sundial is called a dial plate. It may be made of metal, wood, stone, or other materials. Numbered lines on the dial plate, called hour lines, show the hours of the day.

A part called a gnomon sticks up at an angle from the dial plate. The sloping edge of the gnomon is called the style. As the day passes, the gnomon's shadow moves around the dial. Every hour it falls on a new hour line.

The ancient Egyptians made the earliest known sundial in about 3500 BC. This sundial was simply a stick or a pillar that cast a shadow on the ground. The ancient Greeks made a sundial with a bowl-shaped opening cut into a block of

stone or wood. A pointer in the center cast shadows inside the bowl. Muslims later invented the modern sundial—the type with the angled gnomon. Clocks began to replace sundials in the 1300s.

► More to explore

Clock • Time

Sunflower

Sunflowers are useful plants with large flower heads, or blooms. They are named for the way they turn their blooms from east to west to follow the sun. Sunflowers were first grown in North and South America. Today they are grown in many parts of the world.

Sunflowers are giants among flowers. The rough, hairy stem grows from 3 to 15 feet (1 to 4.5 meters) tall. The leaves are wide, rough, and 3 to 12 inches (8 to 30 centimeters) long.

The bloom of a sunflower has two parts. The center is a disk of small flowers packed closely together. The disk flowers are brown, yellow, or purple. The flowers around the outside are called ray flowers. They are golden yellow. Some sunflowers have disks that are 12 inches (30 centimeters) wide.



Sunflowers brighten a field in France.

Sunflower plants have many uses. The flowers make a yellow dye. The leaves are used to feed animals. Seeds that come from the disk flowers contain a sweet, yellow oil. Sunflower oil is used in cooking and in making soaps and paints. Many people eat dried or roasted sunflower seeds as a snack.

► More to explore

Flower • Plant • Seed

Sun Yat-sen

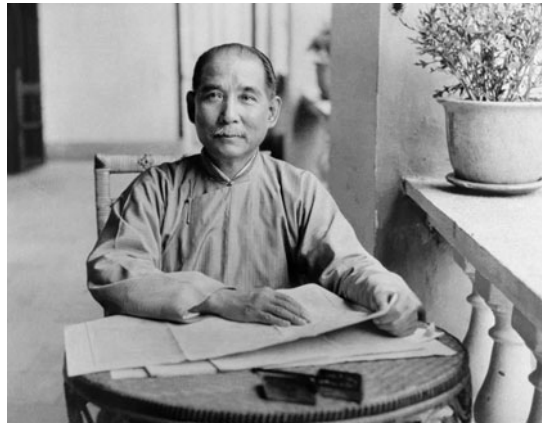
Sun Yat-sen helped remove the emperor of China from power in 1912. Sun wanted China to be a strong, modern country with free elections and policies that benefited all citizens.

Early Life

Sun Yat-sen was born on November 12, 1866, in Hsiang-shan, in southern China. For several years he studied with British and U.S. teachers in Honolulu, Hawaii. Later he studied to be a medical doctor in Hong Kong, which was then a British colony. He graduated in 1892.

Revolutionary Leader

Sun soon found a new career. He started working to bring down China's ruling family. Sun thought that China had fallen behind other countries in developing technology. He felt that changing the government was the only way to make China a modern country. In 1895 he took part in an uprising that failed. He then had to leave the country.



Sun Yat-sen

Sun spent the next 16 years living in other countries, including the United States and the United Kingdom. During this time he gathered followers and planned several rebellions. The rebellions failed, but he continued to gain support.

In 1911 the Chinese people finally rose up against the emperor. Sun then returned to China. He became the leader of a new political group called the Nationalist Party. The emperor stepped down on February 12, 1912.

Sun helped establish a new government, but he disagreed with the man who became president. He organized another revolution in 1913, but it failed. He also tried to gain control of the government in 1917 and 1921. Finally, in 1923 Sun made himself the leader of a new Chinese government.

Last Years

Sun worked hard to strengthen the Nationalist Party. He also established a military academy. He died on March 12, 1925. Under the leadership of Chiang

Kai-shek, the Nationalist Party went on to rule China from 1928 to 1949.

► **More to explore**

Chiang Kai-shek • China

Superior, Lake

Lake Superior is the largest, the coldest, and the deepest of the five Great Lakes of North America. It is also one of the world's largest bodies of freshwater. The lake got its name from the French words *lac supérieur*, which mean “upper lake.”

Lake Superior lies between the United States and Canada. It borders the Canadian province of Ontario and the U.S. states of Minnesota, Wisconsin, and Michigan. It spreads over an area of 31,700 square miles (82,100 square kilometers). The Saint Marys River connects Lake Superior with Lake Huron in the east.

Lake Superior has many natural harbors. They include Thunder Bay,



Waves wash up on the rocky shoreline of Lake Superior on the Upper Peninsula of Michigan.

Ontario; Duluth and Two Harbors in Minnesota; and Marquette, Michigan. Huge ships carry minerals, flour, and grain on the lake. They pass through the Sault Sainte Marie canals on the Saint Marys River. Then they travel to other Great Lakes ports or to ports around the world.

Tourism is an important industry in the Lake Superior region. The lake is known for its beautiful shoreline. Hunting and sport fishing are popular activities.

► **More to explore**

Great Lakes • Sault Sainte Marie Canals

Supreme Court of the United States

► see United States Government.

Surgery

Surgery is a medical treatment in which doctors called surgeons use tools to work on a patient's body. Surgery is also known as an operation. Surgeons perform operations for many reasons. They may operate to treat injuries, to remove unhealthy tissue, or to discover the cause of a disease.

Before Surgery

Before performing surgery, the doctors and nurses wash their hands thoroughly. They also put on gowns, caps, gloves, and masks to keep germs away from the patient. They set up machines that will keep track of the patient's breathing and heart rate. They may use drugs to numb the part of the patient's body on which they will operate. Or they may put the patient to sleep with a drug called anes-



Surgeons work in operating rooms that are brightly lit, extremely clean, and stocked with tools and supplies.

thesia. Under anesthesia, the patient feels no pain.

During Surgery

Doctors and nurses may use many different tools during surgery. All these tools must be sterilized, or made free of germs, beforehand. Surgeons commonly use a knife called a scalpel to cut into the body. Special instruments clamp blood vessels to stop the patient from bleeding too much. Sponges absorb some blood, too. Other tools hold the cut tissue open so that the surgeon can work inside the body easily. When finished, doctors usually sew or staple the cut tissue back together.

History

In ancient times people in such places as India, China, Egypt, and Greece performed some types of surgery. During the Middle Ages (about AD 500 to 1500) in Europe, barbers often performed surgery.

Until the 1800s there was no good way to dull the extreme pain of surgery. But in the 1840s surgeons began using ether, an early form of anesthesia. Surgery then became less painful. However, many patients who had surgery still died. Later in the 1800s scientists learned that infections by germs caused many of these deaths. Surgeons began washing their hands and tools to prevent infections during operations. Many more patients then survived surgery.

► More to explore

Disease, Human • Medicine

Did You Know?

Surgeons now use laser beams instead of knives to perform some of their operations.



Suriname

Suriname is the only country in South America that was a colony of The Netherlands. The capital is Paramaribo.

Suriname is on the northern coast of South America. Brazil is to the south. Suriname and its other neighbors, Guyana and French Guiana, disagree about where their borders lie.

The land along the coast is flat and swampy. Hills and mountains cover the rest of the country. Tropical rain forests grow in most of Suriname. Monkeys, sloths, tapirs, deer, jaguars, and parrots live in the country.

The largest groups of people in Suriname are the Hindustanis and the Creoles. The Hindustanis' ancestors came from India. The Creoles have mixed European and African roots. The Javanese, whose ancestors came from Indonesia, are the next-largest group. Maroons (people with African roots),



The Presidential Palace in Paramaribo, Suriname, was built in the 1700s.

American Indians, Chinese, and whites form smaller groups.

Dutch is the national language, but most people mainly speak the language of their group. Christianity, Hinduism, and Islam are common religions.

The economy of Suriname depends on the mining of bauxite (which is used to make aluminum), gold, and oil. Farmers grow rice, sugarcane, bananas, and coconuts. Fishers catch shrimp and fish.

Surinen Indians and other American Indians were the first people in the region. The Dutch took over in 1667. They brought in Africans to work as slaves and, later, Asian workers. Suriname gained independence in 1975. The military took over the government in 1980. Suriname returned to a democratic government in 1991.

► **More to explore**
Paramaribo

Facts About SURINAME



Population
(2008 estimate)
516,000

Area
63,251 sq mi
(163,820 sq km)

Capital
Paramaribo

Form of government
Republic

Major cities
Paramaribo, Lelydorp, Nieuw Nickerie, Mungo (Moengo), Meerzorg



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Suva

Suva is the capital of Fiji, an island country in the southern Pacific Ocean. Suva is located on the southeastern coast of Viti Levu, Fiji's largest island.

Suva is one of the most modern cities in the South Pacific. The University of the South Pacific is near Suva. Suva also has government buildings and the Fiji Museum, which displays items from the country's history.

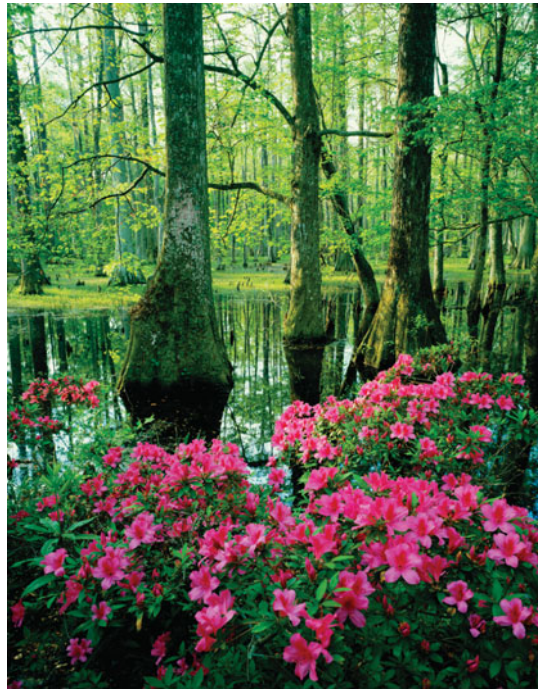
Suva's harbor is a regular stop for ships carrying goods across the Pacific Ocean. Sugar and clothing are exported from Suva. The city's other economic activities include tourism and some manufacturing, including soapmaking.

Suva was founded in 1849. In 1874 Great Britain made Fiji a colony. The British made Suva the capital in 1882. In 1970 Fiji became an independent country. Suva remained the capital.

► More to explore

Fiji

Swamp



Bald cypress trees and azalea bushes grow in the shallow water of a swamp.

A swamp is a type of wetland where trees are common. Swamps are similar to marshes because both have soils that are rich in minerals. Marshes, however, have grasses instead of trees.

Swamps are common in low-lying areas near rivers, which supply the water. Swamps also form on flat land along seacoasts. The soil in a swamp is poorly drained, which means that the water flows through very slowly. The ground becomes soaked. Shallow water often covers the ground.

Swamps may have either freshwater or salt water. The kinds of plants in a swamp depend on the type of water. Bald cypress, gum, willow, alder, maple, and palm trees are common in freshwa-



Fiji's lawmakers meet at the Parliament House in Suva.

ter swamps. Saltwater swamps have few plants because most plants cannot grow in salt water. However, mangrove trees thrive in saltwater swamps.

Swamps are often rich in wildlife. Alligators, shrimps, crayfish, snakes, frogs, snails, fish, and birds live in swamps.

► More to explore

Mangrove • Marsh • Wetland

Swan

Swans are waterbirds with heavy bodies and long necks. They swim gracefully, seeming to glide across the water. They are also strong fliers. Along with ducks and geese, swans belong to a family of birds called waterfowl in North America and wildfowl in Europe. Swans are the largest and the least common of the waterfowl.

Swans are found on or near water. Most types migrate, or fly long distances to spend different seasons in different regions.



Baby swans, called cygnets, ride on the back of an adult mute swan.

Five species, or types, of swan live in the northern parts of Europe, Asia, or North America. These are the mute swan, the trumpeter swan, the whooper swan, Bewick's swan, and the whistling or tundra swan. All five northern species are white.

Three species of swan are found in southern regions. The black swan lives in Australia. Two types are found in southern South America: the black-necked swan and the coscoroba.

Swans are among the larger flying birds. The trumpeter swan is the largest waterfowl. It can reach 5.5 feet (1.7 meters) in length. The mute swan is also very large and heavy.

Like the other waterfowl, swans have webbed feet. This gives them extra paddling power in the water. Waterfowl also have a gland that makes oil. The oil helps protect their feathers from water. An inner layer of soft feathers called down helps the birds stay warm.

Swans use their long necks to pluck plants from below the surface of the water. They also eat seeds, small water creatures, and fish eggs.

Swans mate with the same partner each year. The female lays about six eggs at a time. The young of white swans usually have darker feathers than their parents.

► More to explore

Bird • Duck • Goose • Migration, Animal

Swaziland

The small kingdom of Swaziland is one of the few countries in Africa with a ruling king. Swaziland has two main capitals, Mbabane and Lobamba.

Swaziland is almost surrounded by South Africa. On the east it has a short border with Mozambique. The land slopes down from highlands in the west to lowlands in the east. Mountains rise sharply in the far east.

Grasses and scattered shrubs cover most of Swaziland. Pine and eucalyptus trees grow in the west.

Antelopes, hippopotamuses, rhinoceroses, elephants, giraffes, and zebras live mainly in protected parks. Swaziland's other animals include monkeys, jackals, mongooses, crocodiles, and snakes.

The Swazi are the main people in Swaziland. The Zulu and the Tsonga form smaller groups. English and Swazi are



Girls from all over Swaziland take part in a ceremony called the reed dance.

the main languages. Most of the population is Christian. Most people live in the countryside.

Many people work as farmers. Crops include sugarcane, corn, and cotton. Cattle and goats are the main livestock. Swaziland's industries make soft drinks, clothing, wood pulp, and metal products. Mines provide coal. Tourism and other services are also important to the economy.

The Swazi people did not set up a kingdom until the 1800s. The Swazi king soon asked the British in South Africa to help defend the kingdom against the Zulu people. Great Britain took control of Swaziland in the early 1900s.

Swaziland gained independence in 1968. A Swazi king ruled the country into the 21st century.

► **More to explore**
Mbabane



Facts About SWAZILAND



Population
(2008 estimate)
1,018,000

Area
6,704 sq mi
(17,364 sq km)

Capitals
Mbabane
(administrative and judicial),
Lozitha and Ludzidzini (royal),
Lobamba
(legislative)

Form of government
Monarchy

Major cities
Mbabane, Manzini, Big Bend, Mhlume, Malkerns





Sweden

The Kingdom of Sweden is a large country in northern Europe. During the 1600s Sweden was one of the most powerful countries in Europe. Today Sweden is a peaceful, wealthy country. The capital is Stockholm.

Geography

Sweden is the largest country in Scandinavia, a region that also includes Norway and Denmark. Norway lies along Sweden's long western border. Sweden shares a shorter border with Finland in the northeast. The Gulf of Bothnia and the Baltic Sea lie off Sweden's east coast. Narrow bodies of water separate Sweden from Denmark to the southwest.

A long range of mountains runs along the western border of Sweden. In the east there are low plains. Many small rivers start in the mountains and run toward the southeast. Lakes dot the land.



A castle is reflected in a water garden in Kristianstad, Sweden.

Sweden generally has a mild climate with cool summers and cold winters. However, northern Sweden has very cold, dark winters. In the north it can snow for eight months a year. North of the Arctic Circle, the sun hardly rises during the winter.

Plants and Animals

Forests of fir, pine, and birch trees cover much of the land. Many berries and mushrooms grow in the forests.

Animals in the forests include hares, weasels, squirrels, foxes, elk, and bears. The Sami people (or Lapps) raise herds of reindeer in the far north. Moose and lynx also live in the north. Many fish swim in Sweden's lakes, rivers, and seas.

People

Most of the people of Sweden are Swedes. Finns, Serbs, other Europeans, and some Asians and Africans form smaller groups. There are also several thousand Sami in Sweden. The Sami live in far northern Scandinavia.

Swedish is the country's main language. Most people belong to the Church of Sweden, a branch of Lutheran Christianity. Most of the people live in cities, mainly in the south.

Economy

Services, including banking, health care, and communications, are key parts of Sweden's economy. Manufacturing is also important. Two of Sweden's major companies, Saab and Volvo, make cars. Sweden also produces machinery, electronics, paper, metals, food products, and furniture. Mines provide iron, zinc, copper, and other minerals. The country's forests provide wood.

Agriculture is a small part of the economy. Farmers grow mainly sugar beets, wheat, and barley. Pigs, cattle, and sheep provide meat and dairy products. Fishing is another source of food.



A railway station lies nestled in the snow in a small town in northern Sweden.

History

Humans have lived in what is now Sweden for thousands of years. The Sami were some of the earliest people in the region.

Warriors known as Vikings lived in Sweden and most of Scandinavia beginning in the 800s. For the next 200 years the Swedish Vikings attacked lands across northeastern Europe and into Russia.

In the Middle Ages Sweden was divided into a number of provinces, each with its own laws. Powerful local kings struggled for control of Sweden. The provinces joined together to create a unified kingdom by the 1200s. Sweden took over Finland in 1323.

A Troubled Union

In 1397 a single king gained power over Sweden, Norway, and Denmark. The three kingdoms stayed together for about 125 years. But there were many conflicts between Sweden and the other kingdoms. One of the worst battles hap-

Facts About SWEDEN



Population
(2008 estimate)
9,214,000

Area
173,860 sq mi
(450,295 sq km)

Capital
Stockholm

Form of government
Constitutional monarchy

Major cities
Stockholm, Göteborg, Malmö, Uppsala, Linköping, Västerås



The picturesque lanes of Gamla Stan, or the Old Town, of Stockholm, Sweden, are well suited to strolling.



TIMELINE

Sweden becomes a united kingdom.

Sweden leaves the union.

Sweden takes Norway from Denmark.

Sweden takes power away from its king through a new constitution.

1100s	1397	1523	1611	1814	1905	1975
	Sweden, Denmark, and Norway form a union.		Gustav II Adolf becomes king of Sweden.		Sweden gives Norway independence.	

pened in 1520. Danish armies invaded Sweden and killed many people in an event called the Stockholm Bloodbath. Sweden broke away from the union in 1523.

A Great Power

In the 1600s Sweden became a great power, led by King Gustav II Adolf. Sweden conquered large parts of the neighboring countries of Finland, Estonia, Russia, and Poland. Gustav died in battle in 1632. Nevertheless, Sweden remained the most powerful country in northern Europe for nearly another 100 years.

In the 1700s and early 1800s Sweden fought a number of wars against Russia. Sweden lost a great deal of land, including Finland, to Russia. However, Sweden later joined with Russia and Great Britain in a war against France. Sweden also took Norway from Denmark in 1814. Sweden ruled Norway until 1905.

Modern Sweden

In modern times Sweden has worked to stay neutral—meaning that it does not take sides in conflicts between other countries. Sweden did not fight in either of the world wars of the 20th century.

In the second half of the 20th century Sweden became one of the richest countries in Europe. The Swedish people also paid some of the highest taxes in the world. The government used the tax money to provide many social services, including free education and health insurance for all Swedes.

In 1975 Sweden took away the last powers of its king. A prime minister then led the government. In 1995 Sweden joined the European Union (EU), a group of democratic countries. However, in 2003 Sweden voted against using the euro, the EU's form of money.

► More to explore

European Union • Stockholm • Vikings

Sweet Potato



Sweet potatoes are not related to potatoes. They are the large roots of a separate plant.

The sweet potato is an important food source. It is very nutritious and high in vitamin A. The sweet potato grows in most warm, moist climates. Its scientific name is *Ipomoea batatas*. The sweet potato is not related to yams or potatoes.

The sweet potato plant is a climbing vine. Funnel-shaped flowers grow in clusters on the vines. The flowers are shaded with pink or rose violet.

The root of the sweet potato plant is the part that is eaten. Each plant produces 4 to 10 of these roots. They are usually oval with pointed ends. The skin of a sweet potato ranges in color from tan to brown to purplish red. The inside can be white, orange, or even purple.

People eat sweet potatoes boiled, baked, or fried. They can be used as a side dish or as a filling for pies. The leaves of the sweet potato plant also can be eaten. Both the root and the vines are used as food for animals, too.

► More to explore

Potato • Root

Swimming

Swimming is a popular exercise and sport. As exercise, swimming provides all-around conditioning for both young and old. As a sport, swimming includes races that are held at athletic clubs, schools, and national and international competitions. Swimming is a major part of the Summer Olympic Games.

Swimming moves a person's body through water. Unlike many animals, humans are not able to swim at birth. A person must learn how to swim. A beginning swimmer learns how to repeat a series of arm and leg movements. These movements are called swimming strokes.

Swimming Strokes

Swimming strokes provide the power to move a swimmer through the water. There are five major swimming strokes: freestyle (or crawl), breaststroke, butterfly stroke, backstroke, and sidestroke.

Freestyle swimming is noted for its speed. A freestyle swimmer's arms alternate, or take turns, in creating the power stroke. In the breaststroke, both arms perform a power stroke at the same time. Then both legs perform a power stroke called the frog kick. In the butterfly, the arm movements look something like the flapping of a butterfly's wings. The backstroke is similar to the freestyle. However, it is performed with the back to the water instead of face down. In the sidestroke, the swimmer lies on either side.

Sport Swimming

A swimming contest is called a meet. Meets are held in large pools marked with swimming lanes to guide the swimmers. The most important international meet occurs every four years at the Olympic Games.

The four strokes used in the Olympics and other international competitions are freestyle, breaststroke, butterfly, and backstroke. There are races for individual swimmers and for teams of four. The team events are called relays. In most races the swimmers use only one

stroke. However, all four strokes are used in events called medley races. The races cover distances ranging from 50 to 1,500 meters (164 to 4,921 feet).

Races longer than 1,500 meters are called long-distance swimming. Long-distance races usually take place in lakes or other natural bodies of water.

One of the most famous distance swims took place in 1875. In that year Matthew Webb of Great Britain became the first person to swim across the English Channel. The channel is the part of the

Freestyle or Front Crawl Stroke

arms are used one at a time to pull the swimmer's body through the water



Breaststroke

glide position

arms extend forward, hands are pulled to the side



Butterfly

hands enter the water shoulder width apart

arms move outward and downward

head breaks water as arms push back



Backstroke or Back Crawl Stroke

arms come out of the water and reach backward one at a time



Atlantic Ocean that separates Great Britain from France. In 1926 Gertrude Ederle of the United States became the first woman to swim the channel.

History

The Egyptians practiced swimming as early as 2500 BC. In ancient Greece and Rome young males learned to swim as part of their schooling. In ancient Japan swimming races were held in the 1st century BC.

Swimming contests first became popular in the 1800s. The first swimming cham-

pionship was held in Australia in 1846. In England a meeting of swimming clubs in 1869 led to the creation of the Amateur Swimming Association. It became Great Britain's governing body of sport swimming. The Amateur Athletic Union, founded in 1888, governs swimming in the United States. In 1896 the first modern Olympic Games included swimming events. The popularity of the Olympics helped the sport to grow.

► More to explore

English Channel • Olympic Games



face is placed in water as the kick is started

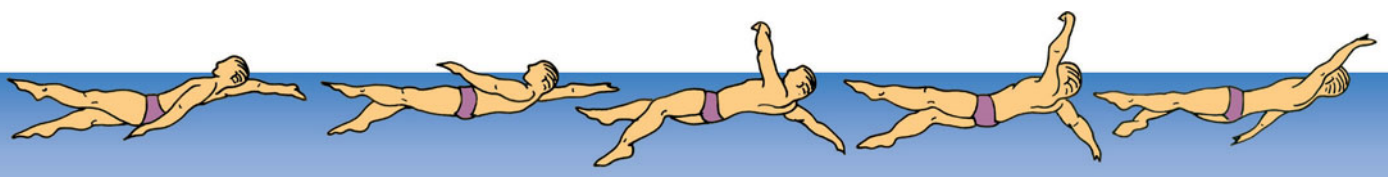
arms are straightened as kick ends

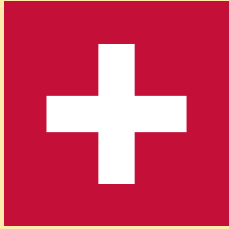
return to glide



toes are pointed outward from body

shoulders rotate bringing arms around





Switzerland

The country of Switzerland is in the heart of Europe's highest mountain range, the Alps. The country is known for its long tradition of staying neutral, or not taking sides, in wars. The capital is Bern.

Geography

Switzerland is in central Europe. It shares borders with France, Germany, Liechtenstein, Austria, and Italy.

Mountains cover more than half of the country's land. The Swiss Alps are in the central and southern parts of the country. The Jura Mountains run along the western border with France. A hilly region lies between the Alps and the Jura Mountains.

Many important rivers, including the Rhine and the Rhône, begin in the Swiss mountains. The largest lakes in Switzer-



A small village in Switzerland sits in a valley near the Swiss Alps. Much of the country is mountainous.

land are Lake Constance in the northeast and Lake Geneva in the southwest.

Fog often covers the country's lower lands. The Swiss mountains receive more rain and snow than the valleys. About 10,000 avalanches happen each year in the mountains.

Plants and Animals

Leafy trees and evergreens grow in the lower areas. Shrubs, mosses, and lichens grow in the higher regions. Grasses cover much of the central hills.

Small, goatlike antelope called chamois live high in the Alps. In the forests there are deer, rabbits, foxes, badgers, and squirrels.

People

Swiss people who speak German make up most of the population. Swiss who



speak French or Italian also form large groups. A smaller group of people in the east speak an ancient language called Romansh. There are also small groups of Slavs, Portuguese, Spanish, and others.

Most Swiss are Christians. There are slightly more Roman Catholics than Protestants. More than two thirds of the population lives in cities.

Economy

Switzerland is one of the richest countries in the world. The economy is based on services and manufacturing. Tourism and banking are important service industries. Swiss banks are famous for their policy of strict privacy. This has allowed them to attract customers from around the world. Manufacturers make machinery, chemicals, clocks, watches, food products, and other goods. Switzerland has few natural resources, so most raw materials needed for industry must be bought from other countries.

Swiss farmers grow sugar beets, wheat, barley, potatoes, apples, and grapes. They also raise cattle and pigs. Switzerland is known for its dairy products and chocolates.

History

More than 2,000 years ago a Celtic people known as the Helvetii lived in western Switzerland. The ancient Rhacians controlled the east. After 58 BC the region was a part of the Roman Empire. From the AD 200s through the 500s Germanic tribes invaded.

Hapsburg Rule

During the 1000s the Hapsburg family of Austria gained power over Switzerland. In 1291 some small Swiss communities, called cantons, joined forces against the Hapsburgs. They formed a union known as the Swiss Confederation. More cantons joined later. (Today Switzerland has 26 cantons.)

During the 1500s Switzerland was a center of the Reformation. The Reformation began as an effort to change some practices of the Roman Catholic church. It turned into a revolution that split the Christians of western Europe into Protestants and Catholics. Protestants battled Roman Catholics in parts of Switzerland.

A Neutral Country

Switzerland gained independence from the Hapsburgs in 1648. France invaded Switzerland in 1798. In 1815 Switzerland regained its independence. It also became a neutral country. This meant that the Swiss would not choose sides during international conflicts.

Switzerland was neutral during World War I (1914–18) and World War II (1939–45). After the wars Switzerland did not join international organizations such as the United Nations (UN) and the European Union. Nevertheless, the country kept strong ties with the rest of Europe. In 2002 Switzerland finally joined the UN.

► More to explore

Alps, The • Bern • Reformation

Facts About SWITZERLAND



Population
(2008 estimate)
7,617,000

Area
15,940 sq mi
(41,284 sq km)

Capital
Bern

Form of government
Republic

Major cities
Zürich, Geneva,
Basel, Bern,
Lausanne

Swordfish

The swordfish is a fish that was named for its long, thin snout. The swordlike snout is flat rather than rounded. For this reason, the fish is sometimes called the broadbill. The swordfish's scientific name is *Xiphias gladius*.

Swordfish are found in oceans around the world. They are mainly pelagic. This means that they live out in the open sea.

Swordfish grow to about 15 feet (4.6 meters) long. They can weigh as much as 1,000 pounds (450 kilograms). Swordfish are purplish blue in color. The sword is almost black. Unlike most fishes, the adult swordfish does not have scales. It also does not have teeth.

The swordfish has a powerful body that is shaped like a torpedo. Its sword is actually a bony extension of the top jaw. The swordfish eats smaller fishes and squid. It uses its sword to slash through schools of fishes.

Swordfish reproduce by laying eggs. The young swordfish hatch after about two

and a half days. They have teeth and scales but not a sword-shaped snout. By the time a swordfish is about 2 to 4 feet (0.6 to 1.2 meters) long, it has lost its teeth and scales. It also has grown a sword.

Swordfish are important to the fishing industry. They are also popular with people who fish for sport. When caught, a swordfish will use its sword to defend itself.

► More to explore

Fish

Sydney



Population
(2006
estimate), urban
area,
4,293,100

Sydney is a major city in Australia, a country in Oceania. The greater Sydney area is Australia's largest metropolitan area. Sydney has a huge and magnificent harbor. It is one of the most important ports on the South Pacific Ocean. The city is also one of Australia's main centers of business and culture.

Places of Interest

The Sydney metropolitan area stretches across a large section of land. The city center lies along the harbor. The Sydney Harbour Bridge is one of the longest in the world of its kind. The city's most famous landmark, the Opera House, is



A swordfish swims in the Pacific Ocean near Costa Rica.



The Sydney Opera House is a distinctive feature along the city's waterfront.

also on the waterfront. It has several white roofs shaped like shells. Sydney is also home to a large aquarium.

Many beaches and parks surround Sydney. The city is famous as a place for sailing, swimming, surfing, and other sports and recreation.

Economy

Sydney is Australia's main center of banking and business, especially computer and communications services. Tourism, education, entertainment, and trade are also important. Many large companies have headquarters in Sydney. Manufacturing is a smaller part of the city's economy.

History

The people called Aborigines have lived in Australia for many thousands of years. The British began settling in Australia in 1770. Great Britain's rulers decided to use the island as a prison colony, where they could send convicts to serve their sentences. Sydney was founded as a prison colony in 1788.

Sydney soon became a major trading center. It continued to be a home for British convicts until 1840. The city grew rapidly in the late 1800s. By 1930 more than 1 million people lived in the metropolitan area. Sydney and its economy continued to grow throughout the 1900s. Sydney hosted the Summer Olympic Games in 2000.

► More to explore

Australia

Symbiosis

Symbiosis is a close relationship between two different kinds of organisms, or living things. There are three basic types of symbiotic relationships: mutualism, commensalism, and parasitism.

Mutualism is a relationship in which both organisms benefit. For example, bacteria live in the digestive system of cows. The bacteria help the cows by breaking down plants that the cows eat. In turn, the cows provide a place to live and a source of food for the bacteria.



Remora fish have a symbiotic relationship with sharks and other larger sea animals.

Commensalism is a relationship in which one organism benefits but the other is neither helped nor harmed. Remora fish and sharks have a commensal relationship. Remora fish attach themselves to sharks. The fish eat scraps left over by the sharks. But the fish do not affect the sharks.

Parasitism is a relationship in which one organism benefits but the other is harmed. The organism that benefits is known as a parasite. Parasites live on organisms known as hosts. Hosts are usually larger than their parasites. Ticks and fleas are examples of parasites. They attach themselves to a dog, a cat, or another host and feed off its blood. This can cause itching, pain, or even disease in the host.

► More to explore

Living Thing • Parasite

Synagogue

A synagogue is a place of worship for people of the Jewish religion. Jews also use synagogues as places to meet and study. Synagogues have played an important role in preserving the Jewish religion and culture throughout history. A synagogue is sometimes called a temple or a shul. (Shul is a word in the Jewish language called Yiddish.)

The layout and design of synagogues can vary greatly. Older synagogues were often built in small streets near a marketplace, in a courtyard, or on the top floor of a building.



A cabinet called the ark is a part of every synagogue. But many other features vary from place to place. A synagogue in Uzbekistan features central Asian carpets.

The most important thing inside a synagogue is the ark, or cabinet, that holds the Torah scrolls. The Torah is a holy book of Judaism. There is also a platform called a bimah, where a reader reads the Torah to the worshippers. There may be a stand where the rabbi, or leader of the synagogue, talks to the worshippers as well.

Worshippers sit in long rows of seats called pews. In the past, most synagogues had separate places for men and women to sit. In the branch of Judaism called Orthodox, men and women still sit separately in the synagogue.

The main part of synagogue worship is the reading of the Torah. Worship services usually take place on Friday nights and Saturday mornings and on holy days and festivals.

► More to explore

Judaism • Temple • Torah

Syria

Syria is a country in the Middle East. The capital is Damascus, one of the oldest cities in the world.

Geography

Syria lies on the eastern end of the Mediterranean Sea. Syria shares borders with Turkey, Iraq, Jordan, Israel, and Lebanon. Syria and Israel do not agree on the location of their border.

A narrow plain runs along Syria's western coast. Mountains lie east of the plain and in the southwest. The highest point in Syria is Mount Hermon. It is 9,232 feet (2,814 meters) tall. East of the mountains is the Syrian Desert. Rock and gravel, not sand, cover the desert. Syria has two major rivers: the Orontes and the Euphrates.

Most of Syria has a dry climate with cold winters and very hot summers. The coast receives more rain and has milder temperatures.

Plants and Animals

There are some forests of yew, lime, pine, and fir trees in Syria's mountains. Date palms grow near the Euphrates River. The Syrian Desert does not have many plants.

Syria is home to deer, bears, squirrels, wolves, hyenas, and foxes. Animals in the desert include snakes, lizards, gazelles, and jumping rodents called jerboas.

People

Arabs make up most of Syria's population. A small group of Syria's Arabs are Bedouins, people who herd animals in the deserts of the Middle East. After Arabs, the next largest group is the Kurds. Small groups of Armenians, Turks, and others also live in Syria. Arabic is the main language. Most people live near the coast or in the Euphrates River valley.

Most Syrians practice Islam. Christians make up a small part of the population. A small number of Syrians follow Druze, a religion that combines Islam, Christianity, Judaism, and other faiths.

Economy

The government controls the economy in Syria. The largest sections of the economy are agriculture, mining, and manufacturing. Farmers grow wheat, sugar beets, cotton, olives, grapes, and





Two Syrian men sell bunches of dates.

other crops. Many people raise sheep, goats, and cattle. Syria's mines provide asphalt, salt, marble, and phosphates, which are used to make fertilizer. Manufacturers make cloth, cement, cooking oil, and other goods. Petroleum (oil) is the main product that Syria sells to other countries.

History

Humans have lived in what is now Syria for more than 4,500 years. Some of the earliest peoples wrote on clay tablets that still exist. The tablets tell about life in Syria at that time. Many other peoples—including Egyptians, Hittites, and Assyrians—invaded Syria in its early history. Syria later was controlled by the Babylonian, Persian, and Greek empires. In 64 BC the Romans conquered Syria.

Muslim Empires

In the AD 600s Muslim Arab armies invaded Syria. Muslim empires ruled Syria for most of the next 1,300 years. However, Christian Crusaders controlled some areas between about 1100 and 1300. The last of the Muslim

empires to rule Syria was the Ottoman Empire. It took control in 1516.

Independence

The Ottoman Empire lost power after World War I (1914–18). In 1920 France gained control of Syria. Syria won independence from France in 1946. Military leaders then ruled the country.

In 1948 part of the land to the south of Syria became the country of Israel. Syria and other Arab countries soon fought several wars with Israel. In 1967 Israel took a piece of land called the Golan Heights from Syria.

In the 1970s Syria sent soldiers into Lebanon during a civil war there. Syrian forces stayed in Lebanon until early 2005. In 1991 Syria fought against Iraq in the Persian Gulf War.

► More to explore

Arabs • Damascus • Middle East



The fortress called the Krak des Chevaliers is in southwestern Syria. Christian Crusaders held the fortress for a time in about the 1100s and 1200s.

Facts About SYRIA



Population
(2008 estimate)
19,639,000

Area
71,498 sq mi
(185,180 sq km)

Capital
Damascus

Form of government
Republic

Major cities
Aleppo, Damascus, Homs (Hims), Latakia, Hamah

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The Taj Mahal is covered in white marble and gemstones.

(See Taj Mahal.)

A tapir has a soft, flexible snout like a short elephant trunk. It also has hooved feet like those of a horse.

(See Tapir.)

People first drank tea as a kind of medicine.

(See Tea.)

Tigers live in the wild in China, Russia, and the southern parts of Asia.

(See Tiger.)

In 1985 deep-sea explorers found the remains of the *Titanic* near the Canadian island of Newfoundland.

(See Titanic.)

Tutankhamen became a ruler of ancient Egypt as a child.

(See Tutankhamen.)

Taft, William Howard



William Howard Taft was the 27th president of the United States.

William Howard Taft was president of the United States from 1909 to 1913. He later served as chief justice of the U.S. Supreme Court. He is the only person to have held the country's two highest offices.

Early Life

William Howard Taft was born into a wealthy family on September 15, 1857, in Cincinnati, Ohio. His parents were Alphonso Taft and Louisa Maria Torrey. His father was secretary of war and attorney general under President Ulysses S. Grant.

Taft graduated from Yale University in 1878 and Cincinnati Law School in 1880. He married Helen (Nellie) Heron in 1886. They had three children.

In 1887 Taft became a judge of the superior court of Ohio. He was named a judge of a U.S. circuit court in 1892.

Political Career

In 1900 President William McKinley asked Taft to organize a government for the Philippines. The country had come under U.S. control after the Spanish-American War of 1898. In 1901 Taft became governor of the Philippines. Taft returned home in 1904 to serve as secre-



TIMELINE

Taft is born in Cincinnati, Ohio.

September 15, 1857

Taft is elected president.

1908

Taft becomes chief justice of the U.S. Supreme Court.

1921

Taft dies in Washington, D.C.

March 8, 1930

Taft becomes governor of the Philippines.

Taft and Theodore Roosevelt lose the presidential election to Woodrow Wilson.

Taft resigns from the Court.

tary of war under President Theodore Roosevelt.

Presidency

Roosevelt supported Taft in the presidential election of 1908. He believed that Taft would continue his reforms. A Republican, Taft defeated the Democrat William Jennings Bryan to become president.

As president, Taft failed to solve the growing split between conservative and progressive Republicans. The progressives wanted Taft to continue Roosevelt's reforms. Taft did continue to attack the big business groups known as trusts. However, Taft disappointed progressives by approving a high tariff, or tax on imports. He also refused to hire progressives as his advisers.

Roosevelt and the progressives soon left the Republican Party to form the Progressive Party. In the 1912 presidential election the Republican Taft ran against the Progressive Roosevelt and the Democrat Woodrow Wilson. The split in the Republican Party allowed Wilson to win the election.

Later Years

After leaving office Taft taught law at Yale University. In 1921 President Warren G. Harding appointed Taft chief justice of the U.S. Supreme Court. Taft was happier in this post than he was as president. He helped the Court to work faster and to focus on the most important national cases.

Suffering from heart disease, Taft resigned on February 3, 1930. He died on March 8 in Washington, D.C.

► More to explore

Harding, Warren G. • Philippines
• Roosevelt, Theodore • United States
• United States Government

Taiga

The taiga is one of the major biomes of the world. Biomes are regions with similar climates and plants and animals. The main feature of the taiga is its conifer forests. Conifers are trees that form seeds inside cones. The taiga grows across the northern parts of Europe, Asia, and North America. Another name for taiga is boreal forest.

Features

In addition to its forests the taiga is known for its long, cold, snowy winters and short, cool summers. It lies just south of the cold, treeless area called the tundra. Where the two regions meet, there are few trees. The forests are



Shallow ponds and cone-bearing trees are common sights in the taiga.

thicker in the southern taiga. Many lakes and bogs are found in the taiga.

Life in the Taiga

The main trees of the taiga are conifers with needle-shaped leaves. In the south, trees with broad leaves—for example, alders, aspens, and birches—grow among the conifers. Mosses, liverworts, and lichens grow on tree trunks, rocks, and the ground.

The conifers in the taiga have features that help them to survive in the cold, snowy climate. Their branches point downward. This helps snow to slide off easily and keeps the branches from breaking off. In addition, conifers are a dark green color. This means they have more of the substance that allows green plants to soak in sunlight. They need to absorb as much sunlight as possible during the short summer.

Mammals in the taiga include lynx, wolves, moose, reindeer, beavers, shrews, voles, squirrels, and martens. Many birds come to the taiga in summer. Only a few types, including ravens and chickadees, stay through the long winter.

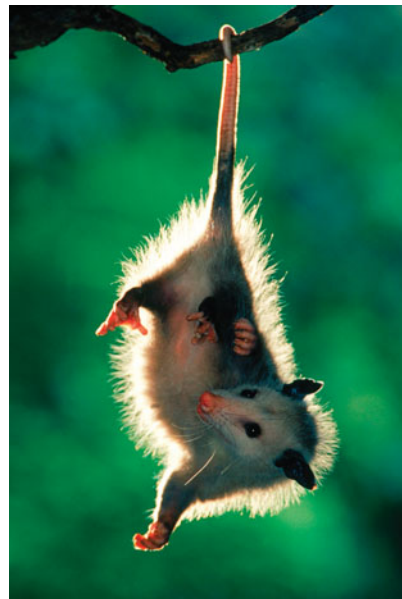
Resources

People cut down many of the trees of the taiga for wood. The earth under certain areas of the taiga is rich in petroleum (oil), natural gas, and coal. However, logging, oil drilling, and mining have harmed the environment in many parts of the taiga.

► More to explore

Biome • Conifer • Forest • Tundra

Tail



A young opossum hangs from a branch by its tail.

Many animals have a tail, which is a body part that extends from the hind-quarters, or rear of the body. In animals that have a backbone, the tail is an extension of the backbone. This type of tail contains bones. In animals without a backbone, the tail does not contain bones.

The tails of most animals have one or more uses. Tails help many animals to move. Some types of monkeys use their tail to grab branches as they swing through the trees. A squirrel uses its tail to balance and steer as it leaps through the air. The tip of a mole's tail is very sensitive. This helps it to move backward through tunnels quickly. The tails of lobsters, fishes, and whales push them through water.

Some animals use their tails as weapons. Crocodiles and alligators swing their

Did You Know?

Few cold-blooded animals, such as snakes, live in the taiga because of the low temperatures.

heavy, strong tails at enemies. A porcupine has sharp quills, or needles, at the end of its tail. A ring-tailed lemur marks its bushy tail with a bad-smelling odor and then waves it at other lemurs. A scorpion stings enemies or prey with its tail.

Many animals use their tails to communicate with other animals. A rattlesnake shakes its tail as a warning when it feels threatened. A male peacock displays his long tail feathers to attract females. This display shows the female how strong and healthy the male is.

► More to explore

Animal

Taino

► see Arawak.

Taipei



Population
(2008
estimate), city,
2,629,270;
urban area,
6,698,320

Taipei is the capital of Taiwan, an island off the southeast coast of China. Taiwan is a province of China. However, Taiwan elects its own government to rule the island. Taipei is Taiwan's largest city. It is also the island's center of business, industry, and culture.



The 2-28 Peace Park is a popular place to visit in Taipei, Taiwan. It was named to honor a group of people who made a protest against their government on February 28, 1947.

Service industries such as banking, trade, and transportation are important to Taipei's economy. Many businesses in the city involve computers or other high-technology goods and services. Factories in Taipei make such products as electronics, software, cloth, and chemicals.

People from the Chinese mainland founded Taipei in the early 1700s. In 1886 China made Taiwan a province with Taipei as its capital. Japan ruled the island from 1895 to 1945. Taipei remained the capital during that period.

The Nationalist political party controlled mainland China in the early 1900s. In 1949 Chinese Communists took over the mainland. The Nationalists fled to Taiwan. They made Taipei their capital. The Nationalists and the Communists each claimed to be the true

government of China. However, in 1971 the United Nations began treating the Communist mainland government as the only government of China.

Taipei grew greatly in the late 20th century. Many people now live in a relatively small city area.

► More to explore

China • Taiwan



Taiwan

Taiwan is a small island off the southeast coast of China. Taiwan is a province of China, not an independent country. However, Taiwan's government has the power to rule the island. Taiwan also calls itself the Republic of China. The capital is Taipei.

Geography

Taiwan lies in the Pacific Ocean about 100 miles (160 kilometers) from mainland China. The Philippines is to the south. Japan lies to the northeast.



Mountains and hills cover the eastern two thirds of Taiwan. Low plains make up the western third of the island. The weather is warm and humid. Severe storms called typhoons often strike the island during the summer.

Plants and Animals

Thick forests cover much of Taiwan.

Cypress, cedar, juniper, maple, and pine trees grow in the mountains. Palm trees, bamboo shoots, and tropical evergreens grow in the lowlands.

Taiwan's animals include foxes, deer, wild boars, monkeys, and goats. The native Formosan black bear lives only in the mountains.

People

Nearly all the people in Taiwan are Chinese. Most of the Chinese have roots in southeastern China. They are often called the Taiwanese. A smaller group of Chinese came to Taiwan in 1949. Their descendants are called "mainlanders." The original people of Taiwan form only a tiny group. They live mostly in the mountains.

Mandarin Chinese is the main language. Taiwan's major religions are Buddhism and Daoism. Most people also follow traditional Chinese religions. Most of the population lives in cities and towns in the west.

Economy

Taiwan has a strong economy based on manufacturing and services such as banking. Factories make electronics,



A huge statue of the Buddha overlooks many other Buddha sculptures at a religious center in Taiwan. Many people in Taiwan practice Buddhism. Buddhism is a religion based on the teachings of the Buddha.

cement, iron and steel, cloth, chemicals, cars, and other goods.

Farmers in Taiwan grow rice, sugarcane, citrus fruits, bananas, and other crops. Fish, pigs, and chickens are other sources of food.

History

People from other Pacific islands and Asia first came to Taiwan between 12,000 and 15,000 years ago. Portuguese sailors arrived in 1590 and gave the island the name of Formosa. Dutch traders later took control of the island.

Chinese and Japanese Rule

In 1661 armies for the Ming Dynasty, or royal family, of China pushed out the Dutch. The Qing Dynasty of China

took over in 1683. The Qing Dynasty ruled Taiwan for the next two centuries. Many Chinese people settled in Taiwan during this time.

In 1894–95 Japan and China fought each other in the Sino-Japanese War. At the end of the war, Japan took control of Taiwan. During World War II (1939–45) the Japanese used Taiwan as a military base. Taiwan returned to China's control in 1945.

Nationalist Government

In the late 1940s two groups, the Communists and the Nationalists, fought for control of China. In 1949 the Communists won. The Nationalists fled to Taiwan and set up their government there. Both the Communists and the Nationalists claimed to be the true government of all of China.

The United Nations (UN) treated Taiwan's government as the government of China until 1971. That year the UN accepted the mainland Communist government as the only Chinese government.

Taiwan Today

Taiwan held its first free elections in the 1990s. The Nationalists lost control of the government in 2000. A party called the Democratic Progressives took power. Meanwhile, some people began calling for complete independence from China.

► More to explore

China • Taipei

Did You Know?

The full Portuguese name of Taiwan—Ilha Formosa—means “Beautiful Island.”



Tajikistan

The small country of Tajikistan lies in the heart of central Asia. Tajikistan's capital is Dushanbe.

Geography

Tajikistan shares borders with Uzbekistan, Kyrgyzstan, China, and Afghanistan. Almost all the land is mountainous. Tajikistan has a dry climate with hot summers and cold winters.

Plants and Animals

Grasses, bushes, and shrubs are the most common plants. Tajikistan's animals include great gray lizards, gophers, deer, tigers, jackals, and brown bears.

People

The Tajik people make up most of the population. The Uzbeks form the second largest group. The country's other peoples include Russians and Kyrgyz. Most of the people speak Tajik and practice Islam. Most Tajiks live in small villages along canals or rivers.

Facts About TAJIKISTAN



Population
(2008 estimate)
6,839,000

Area
55,300 sq mi
(143,100 sq km)

Capital
Dushanbe

Form of government
Republic

Major cities
Dushanbe, Khujand, Kulyab, Kurgan-Tyube



Many rugged, snow-covered peaks lie in the Pamir Mountains of Tajikistan.

Economy

Tajikistan is a poor country. Most people are farmers. The main crops are cotton, potatoes, wheat, tomatoes, and grapes. People also raise sheep, goats, and cattle. Tajikistan's factories produce aluminum, cloth, electricity, food products, machinery, and chemicals.

History

The Tajiks lived in the area by about 2,500 years ago. They set up states along the Silk Road, a trade route to China.

In the AD 600s and 700s Muslim Arabs conquered the area. Beginning in 999, many other groups ruled the land for hundreds of years.

Russia took control in the 1800s. In the 1920s Tajikistan became part of the Soviet Union. Tajikistan gained independence in 1991.

► More to explore

Dushanbe



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Taj Mahal

The Taj Mahal is considered one of the most beautiful buildings in the world. It is located in the city of Agra in northern India. A ruler named Shah Jahan had the Taj Mahal built as a monument and tomb for his beloved wife, Mumtaz Mahal.

Shah Jahan was the Muslim ruler of the Mughal Empire in India from 1628 to 1658. His wife died in 1631, and the construction of the Taj Mahal began the following year.

The monument is located on the bank of the Yamuna (or Jumna) River. It is surrounded by formal gardens and reflecting ponds. The building rests on a square marble base that rises 23 feet (7 meters) high. The building is roughly square-shaped. Each of the four faces of the structure has a large arch that rises 108 feet (33 meters) high. Above the center of the building is an onion-shaped dome.

Pure white marble covers the outside of the building. Set into the marble are gemstones of various colors. These include lapis lazuli, jade, crystal, turquoise, and amethyst. The stones form geometric and floral designs.

The interior of the Taj Mahal is a large room that contains monuments to Jahan and his wife. A carved marble screen surrounds these monuments. Beneath the monuments lie the actual tombs of Jahan and his wife.



White marble and gemstones cover the outside of the Taj Mahal. Some 20,000 people worked on the monument, which took 22 years to build.

Over the years the Taj Mahal has been affected by pollution from nearby factories as well as from motor vehicles. However, steps are being taken to prevent further damage to the site.

Tallahassee



Population
(2000 census)
150,624;
(2007 estimate)
168,979

Tallahassee is the capital of the U.S. state of Florida. The city lies on a series of rolling hills.

Many people in Tallahassee work for the government or in services such as health



Cypress trees grow from beneath the waters of Lake Bradford, in Tallahassee, Florida.

care or education. The city is home to Florida State University and other schools of higher learning. Tallahassee is also the trade center for crops and dairy products produced on nearby farms. Factories in the city make electronics and other products.

Tallahassee was originally an Apalachee Indian village. The village was already established by the time the Spanish explorer Hernando de Soto visited the area in 1539. Creek Indians later moved to Tallahassee. The U.S. government forced the Indians to leave the area in the early 1800s. In 1824 Tallahassee became the capital of the Florida Territory. Florida became a U.S. state in 1845. Tallahassee then became the state capital.

► More to explore

Florida

Tallchief, Maria

Maria Tallchief was one of the greatest U.S. ballerinas. She danced with the

New York City Ballet for 18 years. There she performed many dances created by George Balanchine, an important ballet director.

Tallchief was born on January 24, 1925, in Fairfax, Oklahoma, a town on an Osage Indian reservation. Her father was Osage. She began dancing at a young age. In 1942 she joined the Ballet Russe de Monte Carlo. In 1946 she married Balanchine, the company's choreographer, or dance arranger. The couple soon moved to New York City. There Balanchine founded what later became the New York City Ballet. With that company Tallchief became known for her performances in *The Firebird* and *The Nutcracker*. For one season she was the prima ballerina, or lead dancer.

Tallchief retired as a dancer in 1965. She then taught ballet and directed the Lyric Opera Ballet in Chicago. In 1980



Maria Tallchief was a famous ballerina. She was known for her fine ballet technique.

Tallchief and her sister, who was also a dancer, founded the Chicago City Ballet. The company lasted until 1987.

► More to explore

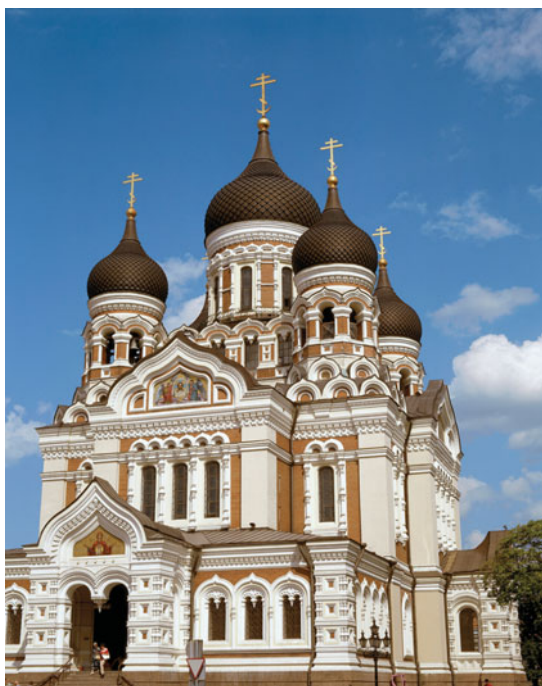
Ballet • Dance

Tallinn



Population
(2007 estimate)
396,850

Tallinn is the capital of Estonia, a country in northeastern Europe. Tallinn has a port on the Baltic Sea. It is Estonia's largest city.



Eastern Orthodox Christians worship at the Alexander Nevsky Cathedral in Tallinn, Estonia.

Tallinn's economy is based mainly on engineering, banking, trade, and other services. The shipment of goods through the port also brings money to the city. Factories in Tallinn make electronic equipment, machinery, cloth, and food products.

People settled in the Tallinn area in ancient times. The town was established by the 1100s. It suffered many invasions. It was ruled by Denmark, by German knights, and then by Sweden. Russia took control of all of Estonia in the early 1700s. In 1918 Estonia became an independent country with Tallinn as its capital.

In 1940 Estonia was forced to become part of the Soviet Union. For a time during World War II (1939–45), Germany controlled Tallinn.

Estonia became an independent country again in 1991. Tallinn remained its capital.

► More to explore

Estonia

Talmud

The Talmud is a collection of ancient Jewish teachings. The written laws of Judaism are found in the Torah, the first five books of the Hebrew Bible. People in ancient Israel also followed many oral, or unwritten, teachings. Jewish leaders, called rabbis, eventually wrote down those oral laws and traditions. They also added their own comments. These included interpretations of the laws as



Young men study the Talmud at a special school called a yeshiva. The Talmud is a collection of ancient Jewish teachings.

well as stories that helped explain moral lessons. Together, these collections of laws, interpretations, and stories are known as the Talmud.

The Talmud was written by many rabbis over hundreds of years. The first part of the Talmud is the Mishna, which states the oral laws. Scholars think that a rabbi in Palestine (a region of the Middle East) finished the Mishna in the early 200s. It has six sections, for laws on daily prayer and farming, special rituals, marriage, criminal and civil law, rules of the temple, and cleanliness.

The second part of the Talmud is the Gemara, which contains comments on the ideas in the Mishna. Rabbis wrote the Gemara from the 200s through the 500s. There are two versions of the Gemara—one written in Palestine and

one written in Babylonia (a historic region of southwestern Asia). Modern scholars consider the Babylonian version to be more complete.

► More to explore

Bible • Judaism • Palestine • Torah

Talon

► see Nail and Claw.

Tanganyika, Lake

Lake Tanganyika is the longest freshwater lake in the world and the second deepest. It is located in eastern Africa. The lake forms the border between Tanzania and the Democratic Republic of the Congo.

The lake is 410 miles (660 kilometers) long. It has a depth of 4,710 feet (1,436 meters). Many rivers flow into the lake. The largest are the Malagarasi, the Ruzizi, and the Kalambo. The lake's only outlet is the Lukuga River.

Rice and other crops are grown along the lake's shore. People also fish in its waters. Several important ports are found along the lake.

In 1858 Lake Tanganyika was first visited by Europeans. At that time British explorers were searching for the source of the Nile River.

► More to explore

Lake

Tanzania



Ngorongoro Crater is a popular tourist spot in Tanzania. Visitors to the area can see zebras and many other animals.

The country of Tanzania contains Africa's highest mountain and its largest lake. Dar es Salaam is the capital, but Tanzania's government has moved some of its offices to a new capital, Dodoma.

Geography

Tanzania has a coast on the Indian Ocean in the east. The country includes the mainland (called Tanganyika) and the islands of Zanzibar, Pemba, and Mafia. Tanzania shares borders with Kenya, Uganda, Rwanda, Burundi, the Democratic Republic of the Congo, Zambia, Malawi, and Mozambique.

Large plains, mountains, valleys, and lakes cover Tanzania's land. The great Serengeti Plain lies in the northeast. East of this plain is Mount Kilimanjaro, the highest point in Africa. Africa's huge Western Rift and Great Rift valleys run through the country. Along Tanzania's borders are three large lakes: Lake Nyasa,

Lake Tanganyika, and Lake Victoria. Lake Victoria is the world's second largest freshwater lake. (Lake Superior in North America is the largest.)

Most of Tanzania is hot and dry. The coast and the islands receive the most rain.

Plants and Animals

Forests grow in the rainy high areas. Grasslands and scattered trees cover much of the country. The large Serengeti National Park protects huge herds of wildebeests, gazelles, and zebras. The park also has many lions, leopards, hippopotamuses, giraffes, and baboons. Rhinoceroses and elephants survive in smaller numbers. Bands of chimpanzees live in the west.

People

Tanzania has more than 120 different ethnic groups. The Sukuma are the





The Masai people live in Tanzania and neighboring Kenya. They are nomads, meaning that they usually do not live in permanent settlements. They follow their herds of cattle and other animals throughout the year.

country's largest group. The Sukuma and other groups have their own languages. Most Tanzanians also speak Swahili, which different groups use to communicate with each other. Some Tanzanians also speak English. The country's main religions are Christianity and Islam. Many people follow traditional African beliefs. Most Tanzanians live in small villages or in the countryside.

Economy

Tanzania's economy depends on agriculture. The main food crops are cassava, corn, sorghum, bananas, rice, and sweet potatoes. Farmers also grow coffee, cotton, cashew nuts, tea, and tobacco. Cloves are grown on the islands of Zanzibar and Pemba.

Small industries in Tanzania make food products, cement, clothing, beer, and cigarettes. Mines provide gold, diamonds, and gems, including tanzanites.

History

Remains of some of the earliest known human ancestors have been found in Tanzania. Some are about 1.75 million years old. Groups of hunter-gatherers lived in the area as early as 5000 BC. Farmers and herders appeared around 1000 BC.

Arab and European Control

By AD 100 Arabs set up trading settlements on the East African coast. In the late 1400s the Portuguese arrived. About 200 years later the Arab rulers of Oman (a country on the Arabian Peninsula) gained control. More Europeans began arriving in the 1800s. Great Britain took over Zanzibar in 1890.

Germany took over the mainland in 1885. The land that is now Tanzania, Rwanda, Burundi, and part of Mozambique became known as German East Africa. In 1919, after World War I, Britain took control of the Tanzania portion. The British named the land Tanganyika.

Independence

Tanganyika gained independence in 1961, and Zanzibar became independent in 1963. The two joined to form the United Republic of Tanzania in 1964. Beginning in the 1990s hundreds of thousands of people poured into Tanzania to escape violence in neighboring countries.

► More to explore

Dar es Salaam • Kilimanjaro, Mount

Facts About TANZANIA



Population
(2008 estimate)
40,213,000

Area
364,901 sq mi
(945,090 sq km)

Capital
Dar es Salaam
(acting)

Form of government
Republic

Major cities
Dar es Salaam,
Arusha, Mbeya,
Mwanza

Taoism

► see Daoism.

Tapir



A tapir walks along a riverbank in Ecuador.

Tapirs are mammals that live in swamps and in forests near rivers. They are related to horses and rhinoceroses. Three kinds of tapir live in Central and South America. Another kind lives in South-east Asia.

A tapir has a heavy body with short legs. It has a soft, flexible snout like a short elephant trunk. Its feet have hooves, like those of a horse. Tapirs weigh 500 to 600 pounds (225 to 270 kilograms). They are 6 to 8 feet (1.8 to 2.4 meters) long, plus a short tail. They stand about 3 feet (1 meter) tall at the shoulder. The tapirs of the Americas have brown or gray hair. The tapir of Asia is black with some white parts.

Tapirs are shy animals that like the deep forest. They sleep most of the day. At night they come out to eat grass, leaves,

water plants, and fruit. A tapir uses its nose to move things aside and find food, like a horse does. Tapirs swim to escape their enemies, such as jaguars and tigers.

Tapirs are endangered, which means they are in danger of dying out. People hunt tapirs for food and sport. Plus, people have destroyed tapirs' homes by cutting down forests for wood.

► More to explore

Horse • Mammal • Rhinoceros

Tarsier

Tarsiers are tiny animals with huge eyes. Their excellent senses of sight and hearing make them good nocturnal, or nighttime, hunters. Tarsiers belong to



A tarsier has pads on the tips of its long fingers and toes. The pads are like suction cups. They help the animal cling to a tree trunk.

the group of animals called primates. Other primates include lemurs, monkeys, and humans. There are at least three different species, or types, of tarsier.

Tarsiers live in the rain forests of Indonesia and the Philippines. They spend most of their time in trees and can leap between trunks 10 feet (3 meters) apart.

Tarsiers have brown, gray, or reddish fur. They are only about 6 inches (15 centimeters) long with a thin, 10-inch (25-centimeter) tail. Tarsiers have a round head with large eyes and ears. Like an owl, a tarsier can turn its head halfway around. Tarsiers' fingers and toes have pads like suction cups that help them to grip branches.

Tarsiers sleep in trees during the day and hunt on the ground at night. They jump on their prey and grab it with their hands. Tarsiers eat small animals such as insects, lizards, and snakes. They do not eat plants.

Some tarsiers live alone. Others live in male and female pairs. They can have babies at any time of the year. The female is pregnant for six months and then gives birth to one offspring. A baby tarsier can climb and jump after only a few days. Tarsiers can live for about 12 years.

► More to explore

Lemur • Monkey • Primate • Rain Forest

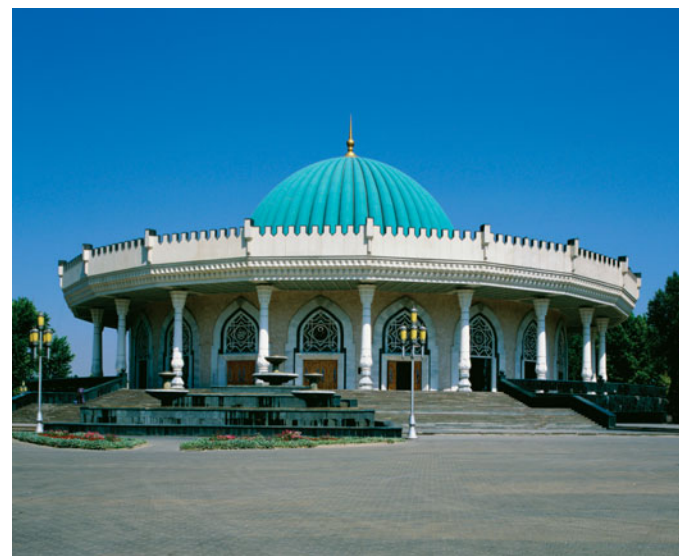
Tashkent



Population
(2007 estimate)
1,959,190

Tashkent is the capital of the country of Uzbekistan. It is one of the largest cities in central Asia. It is also a major center of culture and industry.

Many cotton farms surround Tashkent. Factories in the city make cotton cloth and machines used to process the cotton. Other factories make airplanes, packaged foods, and chemicals. Many people in the city work in government or business offices.



A museum in Tashkent, Uzbekistan, has a domed roof. It is named after Timur, a Mongol leader who ruled what is now Uzbekistan in the 1300s.

Did You Know?

Tarsiers are the only primates that do not eat plants.

Tashkent dates back at least 2,000 years. In ancient times it was an important trading center. Many different groups, including the Turks, the Arabs, and the Mongols, ruled Tashkent over its long history.

In 1865 Tashkent became part of Russia. It soon became a regional capital. Along with Russia, the city became part of the Soviet Union in the early 1900s.

An earthquake destroyed much of Tashkent in 1966. The city was later rebuilt.

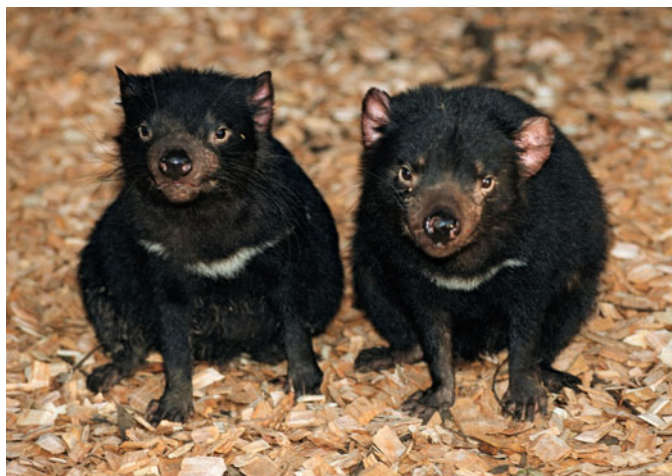
Uzbekistan became an independent country in 1991. Tashkent was made its capital.

► More to explore

Uzbekistan

Tasmania

Tasmania is the smallest state of Australia. Most of its land is a triangle-shaped island. The state also includes the nearby islands of Bruny, King, and Flinders as well as many smaller islands. Macquarie Island, about 900 miles



Tasmania, Australia, is home to small, fierce animals called Tasmanian devils. The island has many kinds of animals and plants that are found nowhere else on Earth.

(1,450 kilometers) to the southeast, is a part of Tasmania, too. Tasmania's capital is Hobart.

Geography

Tasmania lies about 150 miles (240 kilometers) south of Victoria, a state in southeastern Australia. The main island is 180 miles (290 kilometers) long. Its widest part is 175 miles (280 kilometers) wide. The state covers an area of 26,410 square miles (68,401 square kilometers).

A flat, raised area called a plateau covers much of the main island. Mountains rise in the west. Mount Ossa, at 5,305 feet (1,617 meters), is the highest point. The Derwent and the South Esk are the major rivers. The island also has more than 4,000 lakes. Most of these lakes are shallow. But Lake Saint Clair, with a depth of more than 700 feet (215 meters), is Australia's deepest lake. Tasmania's climate is mild and moist.



People

Tasmania is home to about 500,000 people. Most of them have British ancestors. Most of the people live in the southeast and the north. Hobart, in the southeast, is the largest city and main port. Launceston is the main city of northern Tasmania.

Economy

Many Tasmanians work in services—for example, communications, computer work, and tourism. Manufacturing is also important to the economy. Tasmania has many resources to use in manufacturing. Its forests provide wood for the lumber and paper industries. Mines provide iron, zinc, lead, copper, and tin, which are used to make metal products. In addition, Tasmania produces many foods and drinks. Tasmanian farmers grow potatoes, onions, peas, apples, grapes, and hops. They raise dairy cows, beef cattle, and sheep. The coastal waters provide fish.

History

Tasmanian Aborigines, or the first people in Tasmania, may have lived on the island as early as 40,000 years ago. The Dutch explorer Abel Tasman reached the island in 1642. He named it Van Diemen's Land after the governor-general of the Dutch East Indies (now Indonesia). At that time several thousand Tasmanian Aborigines lived on the island. The last full-blooded Tasmanian Aborigine died in 1876.

Tasmania became a part of the British colony of New South Wales (in



Port Arthur was a prison settlement in Tasmania, Australia, during the 1800s. Many convicts were taken there to work as punishment for their crimes. Today Port Arthur's buildings are in ruins. Many tourists visit them.

southeastern Australia) in 1803. In 1825 it became a separate colony. Many of the Europeans who lived there were prisoners sent to the island from Great Britain.

In 1856 the people of Van Diemen's Land elected their own government. They changed the island's name to Tasmania, after the explorer Tasman. In 1901 Tasmania became a state of Australia.

► More to explore

Australia • New South Wales • Victoria

Tax

Governments can get money in various ways. For example, they can charge fees for such things as driver's licenses. But almost every government gets money simply by demanding a certain amount from its citizens. Money collected in this way is called a tax.

Did You Know?

Tasmania is home to a unique animal called the Tasmanian devil. It was named for its fierce growl and bad temper.

Purposes of Taxes

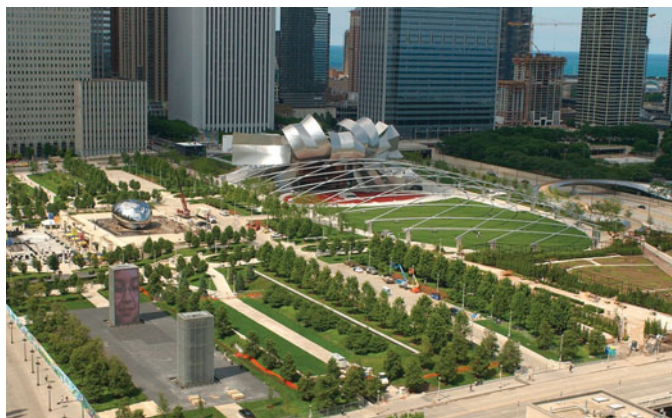
Governments collect taxes for several purposes. The most important purpose is to get money to pay for government services. These services include protection by an army or police, road building, and public education. Some governments use taxes to change people's behavior. For example, they may put high taxes on tobacco to get people to stop smoking. Finally, governments may raise or lower taxes to help their country's overall economy.

Types of Taxes

There are many different types of taxes. Among them are income taxes, property taxes, and sales taxes.

A tax on the money that people make is called a personal income tax. Companies in the United States withhold, or hold back, a part of almost every worker's pay. They send this money to the U.S. government. After the end of the year, people send in income tax returns, which are forms that tell the government how much money they made. Some people then have to pay still more money, while others get back some of their money in a refund. Sometimes governments make rich people pay higher taxes than poor people. Companies also pay taxes on the money they make. This tax is called corporate income tax.

Taxes on the value of land, buildings, and some large possessions (cars, for example) are called property taxes. In the United States, state and local governments collect property taxes.



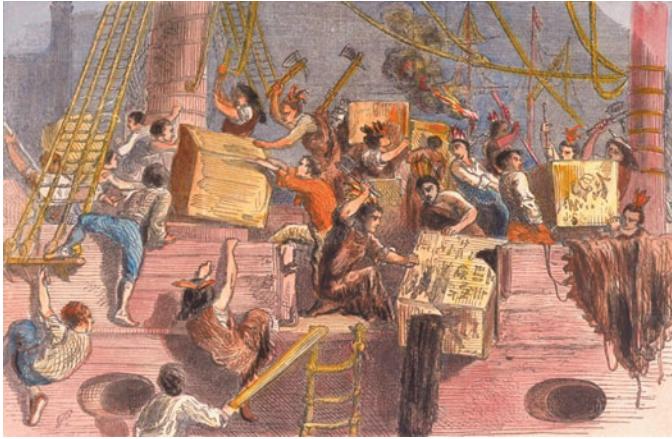
Some taxes are used to build and to take care of such public areas as parks and roads.

When people buy goods and services, they often pay a sales tax on top of the price. Sales tax is usually a certain percentage of the selling price. In the United States, each state has its own sales taxes. However, many countries have national sales taxes. European countries use a form of sales tax called a value-added tax (VAT).

History

In ancient times, most people gave goods or services to a ruler instead of taxes. A farmer might give part of his crop. An ancient Egyptian might help to build a pyramid. However, the rulers of ancient Rome collected taxes in the form of money.

Taxes grew in importance over the years, although people were often unhappy when governments demanded them. The colonists who started the American Revolution in 1775 were angry because they had to pay taxes to Great Britain without having votes in Parliament (the British legislature). An unfair tax system was also one of the



In the Boston Tea Party of 1773, some American colonists destroyed tea to protest a British tax.

causes of the French Revolution, which began in 1789.

In the 1900s some state governments in the United States and governments of other countries looked for ways to collect money without raising taxes. Many began using lotteries (gambling games) to raise extra money.

► More to explore

Economics • Government • Money

Taylor, Zachary

A hero of the Mexican War, Zachary Taylor was elected the 12th president of the United States in 1848. He died after only 16 months in office.

Early Life

Zachary Taylor was born on November 24, 1784, in Montebello, Virginia. His parents, Richard Taylor and Mary Strother, came from important Virginia families. Zachary grew up on a plantation in what is now Kentucky. There

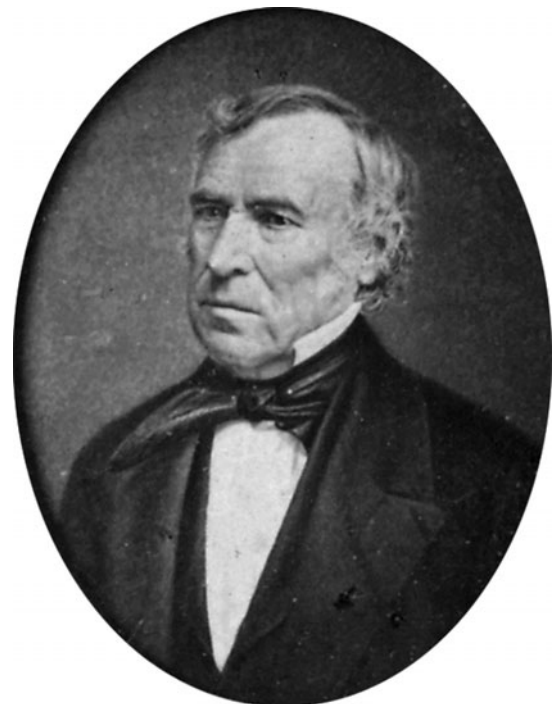
were no schools nearby, so he learned from a tutor.

In 1810 Taylor married Margaret Mackall Smith. They had six children.

Military Career

Taylor joined the Army in 1806. Over the next 40 years he became a respected military leader. His strength and courage earned him the nickname Old Rough and Ready. Taylor commanded troops in the War of 1812 and against Native Americans in various battles.

In 1846, just before the Mexican War, Taylor defended the border of Texas against Mexican troops. Taylor's troops defeated the Mexicans in two battles. After the United States declared war, Taylor crossed into Mexico and captured the city of Monterrey. In 1847 Taylor's forces defeated a larger Mexican army in



Zachary Taylor was the 12th president of the United States.



TIMELINE

Taylor is born in Montebello, Virginia.

November 24, 1784

Taylor leads troops in the War of 1812.

1812

Taylor is elected president.

1848

Taylor dies in Washington, D.C.; Millard Fillmore becomes president.

July 9, 1850

Taylor joins the Army.

1806

Taylor defeats a Mexican army in the Mexican War.

1847

Taylor fights the spread of slavery.

1849

the battle of Buena Vista. That victory made Taylor a national hero.

Presidency

The Whig Party chose Taylor to run for president in 1848. He defeated the Democratic candidate, Lewis Cass, in the election. Taylor was the first man to become president without any experience in politics.

President Taylor had to deal with the difficult issue of slavery. Although he owned slaves, Taylor opposed the spread of slavery. In 1849 he recommended that California be admitted to the Union as a free state—one that would not allow slavery. Taylor's recommendation angered proslavery Southerners in Congress.

Taylor did not live to see the Compromise of 1850, which temporarily settled the slavery crisis. On July 4, 1850, he became ill with cholera. He died on

July 9 in Washington, D.C. Vice President Millard Fillmore became president.

► More to explore

Fillmore, Millard • Mexican War
• Slavery • United States • War of 1812

Tbilisi



Population
(2006 estimate)
1,103,300

Tbilisi is the capital of Georgia, a small country in the Caucasus Mountains of Asia. The city lies on the Kura River. It is Georgia's largest city by far. It is also a major center of industry, culture, and research.



Shops in Tbilisi, Georgia, use both the Georgian alphabet and the Latin alphabet for their signs.

Factories in Tbilisi make machinery, clothing, processed foods, and drinks. Many people in the city work for the government or in tourism or other service industries. Tourists often visit Tbilisi to bathe in the natural hot springs, where hot mineral water spouts from the ground.

Tbilisi was founded in the 450s. The city lay along an important trade route between east and west. This made Tbilisi a valuable prize for many conquering groups. Over the centuries it was ruled by the Persians, Byzantines, Arabs, and Mongols.

In 1801 Russia captured Tbilisi. It became the capital of the Russian province of Georgia. The Soviet Union made Georgia one of its republics in 1921. In

1991 Georgia became an independent country with Tbilisi as its capital.

► More to explore

Georgia, Republic of

Tea

Tea is a strong and energizing drink. It is made by soaking the leaves of the tea plant in hot water. Tea is especially popular in Asia, the United Kingdom, many former British colonies, and the Middle East.

The most common types of tea are black and green, both of which are made from the same plant. The plant likely grew first in China. It now also grows in many other parts of Asia, especially India. Countries in eastern Europe, Africa, and South America also grow tea.

Some teas have added scents or flavors, such as jasmine or orange. Although



Workers pick tea leaves in Malaysia.

most people drink their tea hot, many people in the United States drink iced tea. Other hot drinks made with plant leaves, flowers, or roots may also be called tea. Examples include chamomile tea, South American maté, and South African *rooibos*, or red tea.

According to legend, people first drank tea in China in about 2700 BC. At first people used tea as medicine. In about the AD 200s it became a daily drink. The Dutch and the English brought tea from China to Europe in the 1600s. From there it spread to Europe's colonies.

Technology and Invention

Technology is the use of knowledge to invent new devices or tools. Throughout history, technology has made people's lives easier.

Ancient Technology

Early humans set themselves apart from other animals when they learned to control fire. About 2 million years ago, they also learned to use stones as weapons or tools. This began a period that is known as the Stone Age. Stone Age people also learned to make pottery from clay.

Later on, people learned to work with metal. The people of Anatolia (now in Turkey) made copper tools and weapons as early as 6500 BC. In about 3000 BC people discovered that mixing copper with tin formed a stronger



Thousands of years ago Stone Age people learned to create tools and weapons by chipping away at pieces of stone.

metal—bronze. This discovery began the Bronze Age.

Two important developments took place in the Middle East at the beginning of the Bronze Age. One was the invention of the ox-drawn plow. The other was the invention of the wheel and axle. Many scientists date the beginning of civilization, or advanced culture, to this time.

In the 1000s BC the Hittite people of Anatolia learned to work with iron, which is stronger than bronze. This began the Iron Age. Eventually, people throughout Europe, Asia, and northern Africa made strong iron tools and weapons.

Technology in the Middle Ages

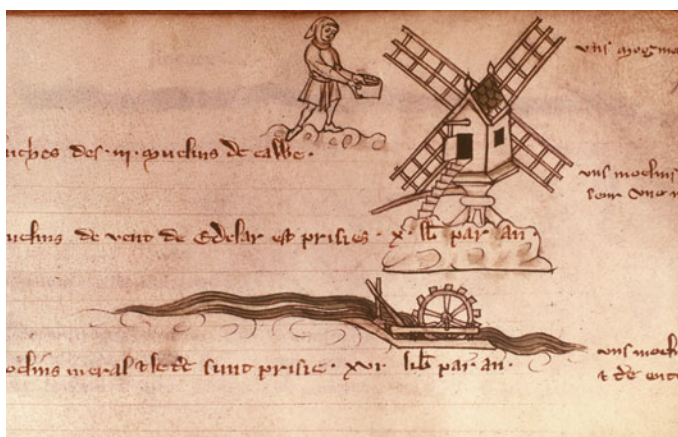
A period called the Middle Ages began in Europe in about AD 500 and lasted until about 1500. Many advances during this time came from other places—

for example, China, the Byzantine Empire, Persia, India, and the Islamic world.

By about the 1400s, Europeans learned the Chinese technique of casting iron. This involved heating iron in a special furnace and then pouring it into a mold to harden. Chinese inventors also developed black powder, the original form of gunpowder.

New sources of power were developed during this time. The horse became a major energy source with the invention of the padded horse collar. The collar meant that the horse could be used to pull plows and other objects. People also harnessed water and wind power to run new types of water mills and windmills.

Two kinds of technology helped to end the Middle Ages and to begin modern times. The rudder (a part for steering a ship), the triangular sail, and the com-



A French book from the late 1200s shows two important inventions: the windmill and the waterwheel. These devices use the power of the wind or the water to run machines, often to grind grain. Before they were invented, the labor of people or animals powered the machines.

pass made possible the sea voyages of European explorers. In about 1450 Johannes Gutenberg invented the printing press. As a result books could be produced in great numbers. Many people learned to read, and learning became widespread.

Industrial Revolution

Iron, Coal, and Steam

Early in the 1700s two English inventors set the stage for the Industrial Revolution. This was a period of great growth of industry. Abraham Darby discovered that a coke-burning furnace produced good iron. Coke is a form of coal. Thomas Newcomen invented a pump that kept coal mines from filling with water. A steam engine powered the pump.

With these developments, coal and iron production expanded rapidly. Iron remained the main metal for building and toolmaking until the late 1800s. At that time steel (a mixture of iron and carbon) began to replace regular iron.

Meanwhile, in the late 1700s steam began to replace wind and water as the major source of power. In a steam engine, burning coal heated water. The boiling water produced the steam that ran the engine.

Machines and Factories

Other inventions also sped up the production of goods—especially textiles, or cloth. By the early 1800s such machines as the power loom made cloth faster and easier to weave. Cloth making moved from homes and workshops into large

mills and factories. The factories used steam engines to run many of their machines. Other industries followed this model.

Transportation

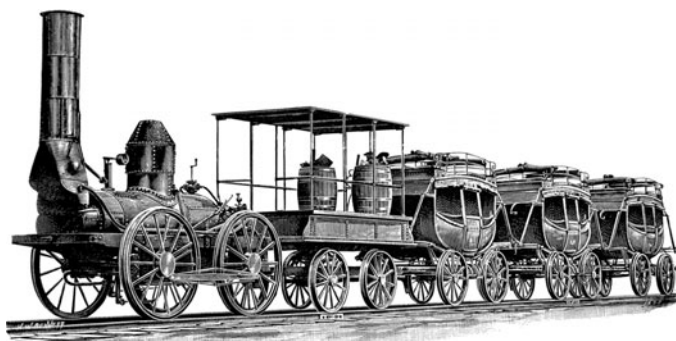
Between 1765 and 1782 James Watt of Scotland greatly improved the steam engine. John Fitch of the United States ran a steamboat as early as 1787. In 1803 Richard Trevithick created the steam locomotive.

In 1856 Henry Bessemer of England invented an improved way of making steel. People began using steel to build railroads, ships, and bridges. (People also used steel to build the first skyscrapers.)

In 1876 the German engineer Nikolaus August Otto built a gasoline-powered engine. By 1885 two Germans named Gottlieb Daimler and Karl Benz had used gasoline engines in the first successful automobiles.

Electricity

In the first half of the 1800s scientists learned to generate, or produce, electricity. In 1835 Samuel F.B. Morse of the United States used electricity in his telegraph. This invention allowed people to communicate across long distances. In 1876 the U.S. inventor Alexander Graham Bell invented the telephone, which also used electricity. Thomas Edison demonstrated the electric lightbulb in 1879. Electric power also came to be used for electric railways in cities.

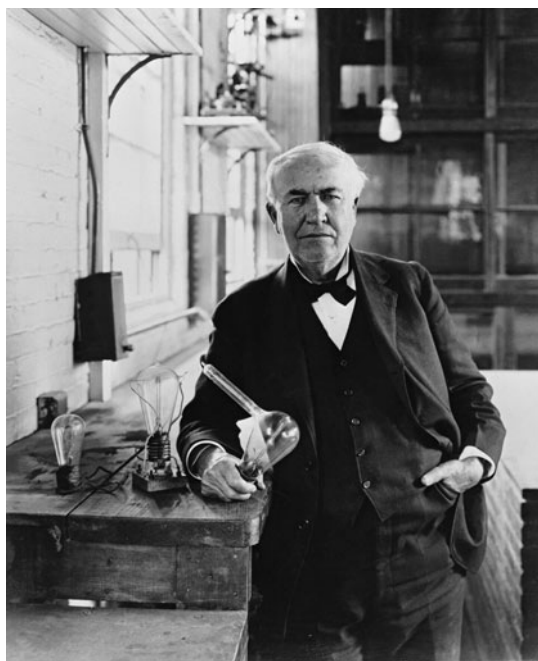


A steam locomotive called the Dewitt Clinton hauled carriages on railroad tracks in the early 1830s.

Petroleum and Chemicals

In the second half of the 1800s petroleum, or oil, became a major power source. Edwin Laurentine Drake drilled the first successful oil well in the United States in 1859. Petroleum can be made into gasoline, fuel oil, and many other products.

In 1856 William Henry Perkin of England made a breakthrough in the



Thomas Alva Edison holds up an early version of the electric lightbulb, which he developed in the late 1800s.

field of chemistry. Starting with coal tar, which is made from coal, he invented the first synthetic, or artificial, dye. Coal tar and petroleum proved to be useful in the making of drugs and plastics as well.

Modern Technology

Mass Production

Modern manufacturing methods can produce goods in large numbers. This is called mass production. An important technique of mass production is the assembly line. An assembly line product is put together one piece at a time as it moves past workers on a conveyor. Each worker does just one task. In the early 1900s Henry Ford perfected the assembly line to make automobiles in the United States.

Later in the 1900s robots began to replace assembly-line workers. A robot is a machine that operates on its own.



A machine in a factory produces polyester cloth. Polyester is an artificial fiber made from coal and petroleum (oil) products.

Air and Space

In 1903 the Wright brothers of Ohio produced the first successful airplane. The Russian-born inventor Igor Sikorsky developed the helicopter in the United States in the 1930s. At about the same time Frank Whittle of England developed a jet engine for airplanes.

German scientists used rockets in World War II (1939–45). Rocket engines carry oxygen as well as fuel. This allows them to work in outer space, where there is no oxygen. After the war the Soviet Union and the United States developed programs to send people into outer space in space ships. In 1957 the Soviets put the first artificial satellite into orbit around Earth. The Americans landed the first human on the Moon in 1969.

Energy

Beginning in the 1900s scientists found ways to harness the energy of sunlight. Solar furnaces use mirrors to focus solar heat. Solar cells make electricity from sunlight.

Scientists also found ways to use the energy that holds atoms together. Atoms are the tiny units that make up everything. This energy is called nuclear energy. It found its first use in very powerful bombs called atom bombs that the United States used in World War II. Scientists soon learned to use nuclear energy to make electric power.

Electronics and Computers

Electronic products changed people's lives greatly during the 1900s. Electronic

products rely on electricity to carry or process information. Radios were some of the first electronic products. By the 1920s radio programs were being broadcast into people's homes. Television, a later electronic product, came into use during the 1930s and 1940s. The first electronic computers were invented in the 1940s as well.

Later in the 1900s electronic products became smaller. People discovered how to fit the parts that make electronic products work onto tiny chips called integrated circuits. These chips made personal computers possible. Other inventions of the late 1900s also used integrated circuits. They included compact disc players, cellular telephones, digital cameras, and many other electronic products.

Technology and Medicine

In the 1900s scientists began applying technology directly to living things. Scientists developed electrical devices to help people with disabilities. Some devices, such as hearing aids and kidney dialysis machines, operate from outside the body. Doctors place other electrical devices inside the body. For example, pacemakers help keep hearts beating steadily.

In addition, scientists learned how to cut and rejoin genes. (Genes are tiny units within cells that carry information about a living thing.) This is called genetic engineering. Genetic engineering may help to cure human diseases. It also



A dialysis machine helps a patient whose kidneys are not working properly. The machine does the work that the kidneys would do. Blood from the patient flows through the machine, where it is cleaned. The blood then returns to the patient's bloodstream.

helps to produce food plants that resist diseases.

► More to explore

Airplane • Automobile • Bridge
• Bronze Age • Computer • Electricity
• Electronics • Genetics • Industrial Revolution • Iron Age • Nuclear Energy
• Petroleum • Plastic • Printing • Radio
• Railroad • Robot • Rocket • Ship
• Steel • Stone Age • Telephone
• Television • Textile

Tecumseh

Tecumseh was a leader of the Shawnee Indians. He fought to keep American settlers out of the Ohio River valley.

Tecumseh was born in 1768 in what is now Ohio. His father was a Shawnee chief. His mother belonged to the Creek tribe. When Tecumseh was about



Tecumseh led American Indians in a losing struggle to keep their land.

6 years old, his father was killed in a battle with white settlers. Then Tecumseh's mother returned to her people. An older sister and brother raised Tecumseh. A Shawnee chief later adopted him.

Tecumseh spent his life fighting American settlers who were taking land from Indians. As a boy during the American Revolution, he helped the British attack American colonists. Later he united Indian tribes to fight Americans. He worked with his brother Tenskwatawa, a religious leader.

Tecumseh saw the War of 1812 as a chance for his people to recover the land they had lost. The war was between Great Britain and the United States. Tecumseh and his warriors helped the British. They hoped a British victory

would allow the Indians to take back their land.

British and Indian forces captured Detroit, Michigan. Later Tecumseh's army invaded Ohio with the British. After failing to capture a fort near Toledo, they crossed into Canada. The British and the Indians were defeated near the Thames River in Ontario on October 5, 1813. Tecumseh was killed in the battle.

► More to explore

Shawnee • War of 1812

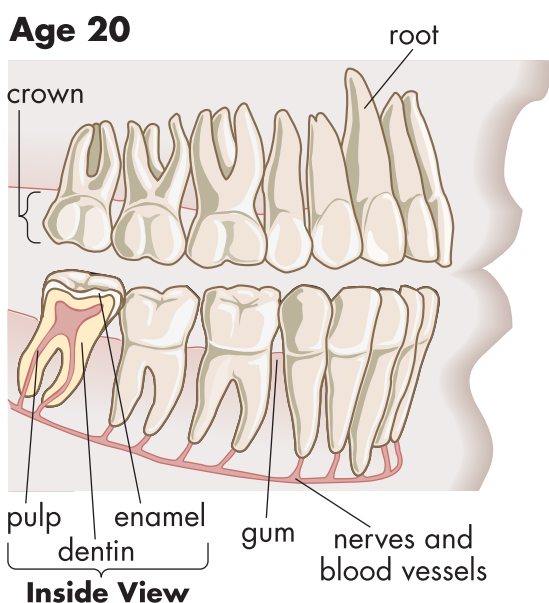
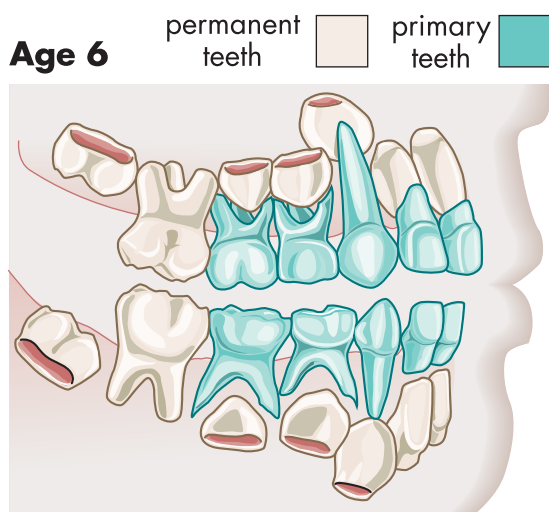
Teeth

Many vertebrates, or animals with backbones, have teeth inside their mouths. Teeth are hard, bony structures that grow from the jawbone. Humans and other animals use their teeth to bite and to chew food.

Types of Teeth

Teeth of different shapes do different jobs. Front teeth, called incisors, bite and cut. Pointed teeth, called cuspids or canines, tear and shred. Teeth with two points, called bicuspid, tear and grind. Back teeth, called molars, crush and grind.

Humans have two sets of teeth during their lives. The first set consists of 20 teeth. These are called primary, or baby, teeth. When a child is about 6 years old, these teeth begin to loosen and fall out. Over the next eight years 28 permanent teeth replace all the baby teeth. When a person is around age 20, four more



A diagram shows the teeth of people at two different ages. Humans have two sets of teeth during their lives. The first set is called the primary teeth. At about age 6, one's primary teeth begin to fall out. The second set, called the permanent teeth, replaces them.

molars, called wisdom teeth, grow in. Many people have their wisdom teeth removed to keep their other teeth straight.

Tooth Structure

The visible part of a tooth is called the crown. Several layers make up the

crown. The outer layer is a hard white covering called enamel. Enamel protects the tooth from wear and tear. Below the enamel is dentin. This yellow, bonelike material is softer than enamel. Dentin makes up the largest part of the tooth.

The center of a tooth is called the pulp. The pulp is soft tissue that contains blood and nerves. Nerves in the teeth send signals to the brain about heat, cold, or pain.

The soft tissue around the base of each tooth is called the gum. The roots of the teeth lie below the gums. A tooth has between one and three roots. A glue-like substance called cementum coats the roots. Cementum keeps the teeth stuck in the jawbone.

Problems with Teeth

A common problem with teeth is tooth decay, or cavities. Cavities can form if a sticky film called plaque is allowed to build up on the teeth. Germs in plaque eat away the tooth and cause pain and infection. Dentists fill cavities to prevent further damage. Plaque can also make gums red, sore, and weak. Over time, weakened gums can wear down so far that the teeth fall out. People can keep teeth healthy by brushing and flossing teeth and visiting the dentist.

Sometimes the teeth do not bite together properly. Dentists called orthodontists can straighten teeth.

► More to explore

Dentistry • Mouth

Did You Know?

The tusks of elephants and walrus are enlarged upper teeth.

Tegucigalpa



Population
(2007 estimate)
944,400

Tegucigalpa is the capital of Honduras, a country in Central America. The city lies on the Choluteca River. It is located in a hilly region surrounded by mountains. It is the largest city in Honduras.

Tegucigalpa is one of the main industrial centers in Honduras. Factories in the city make cloth, clothing, processed foods such as sugar, and other goods.

The Honduras region was once part of a Spanish colony. Spanish conquerors founded Tegucigalpa in 1578. They built the city as a center for mining silver from the nearby mountains.



Many houses sit on hilly ground in Tegucigalpa, Honduras.

Honduras became an independent country in 1838. For much of the 1800s the country's capital shifted back and forth between Tegucigalpa and the city of Comayagua. Tegucigalpa became the permanent capital of Honduras in 1880.

A strong hurricane hit Honduras in 1998. Tegucigalpa was severely damaged.

► More to explore

Honduras

Tehran



Population
(2007 estimate)
7,873,000

Tehran is the capital of Iran, a country in the Middle East. The city lies in the Elburz Mountains. It is Iran's largest city by far. It is also a center of education and industry.

Factories in Tehran make such products as cloth, cement, food products, and medicines. A factory near the city processes oil. Many people in Tehran work in government offices.

Iran has a long history. For most of that history Tehran was not a very important city. In ancient times the city of Rayy

Tel Aviv–Yafo



Population
(2006
estimate), city,
382,500; urban
area,
3,040,400

The bazaar is the market district of Tehran, Iran. The merchants there offer many types of goods for sale.

was the capital of Iran. Tehran was a suburb of Rayy. Invaders nearly destroyed Rayy in 1220. Many people from Rayy then moved to Tehran.

Tehran was the home of several of Iran's rulers from the 1500s to the 1700s. It became the capital of Iran in the 1780s. Since then it has been the country's most important city. In the early 1900s Iran's rulers made Tehran larger and more modern.

During a revolution in 1979 Islamic leaders took control of Iran. Supporters of the revolution captured the U.S. embassy in Tehran. They held a group of Americans as hostages there from 1979 until 1981.

In the 1980s a long war between Iran and Iraq hurt Tehran's economy and development. In the 1990s the city began to grow again.

► **More to explore**
Iran

Tel Aviv–Yafo is a large city in Israel, a country in the Middle East. It is Israel's main center of business and culture. The city lies on the Mediterranean Sea. As its name suggests, it was created by combining two towns: Tel Aviv and Yafo. Yafo is the Hebrew name for the ancient port city of Jaffa.

Most of Israel's banks and insurance companies have headquarters in Tel Aviv–Yafo. Many people in the city work in business services, tourism, and trade. Factories in Tel Aviv–Yafo process diamonds and foods and make clothing, medicines, and high-technology products.



Tel Aviv–Yafo is a modern city on the shore of the Mediterranean Sea.

Did You Know?

The historic section of Tel Aviv–Yafo is called Old Jaffa. It is known for its gardens, narrow alleys, and art studios.

Many thousands of years ago Jaffa was a city of the Canaanite people. It was later ruled by the Egyptians, Israelites, Persians, and others. Muslim Arabs ruled Jaffa from about the 1200s to the middle of the 1900s.

Jewish settlers founded Tel Aviv in 1906. At first it was a suburb of Jaffa. At the time both cities were part of the land called Palestine. In 1948 part of Palestine, including Tel Aviv and Jaffa, became the country of Israel. Israel soon combined Tel Aviv and Jaffa to create the city of Tel Aviv–Yafo.

► **More to explore**
Israel

Telecommunication

Telecommunication is any kind of human communication that takes place across a distance. Several inventions have helped people to communicate quickly over great distances.

The first important step in telecommunication was the telegraph. It was invented in the 1830s by Samuel F.B. Morse. His invention could send coded messages instantly over a wire. Long and short electrical signals, called Morse Code, stood for letters of the alphabet. By 1866 telegraph cables under the Atlantic Ocean linked North America and Europe.

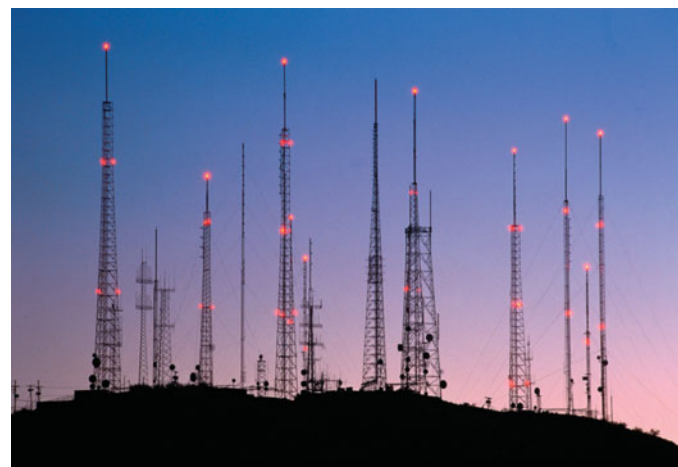
The telephone made it possible to send the sound of the human voice over a wire. Alexander Graham Bell invented the telephone in 1876. Today telephone

signals may travel through wires, through fiber-optic cables, or even as radio waves.

In the 1890s Guglielmo Marconi invented the wireless telegraph, or radio. Like the telegraph, his invention sent messages in code, but the messages traveled through the air as radio waves. Spoken messages were first sent by radio in 1907. The first network of radio stations in the United States was the National Broadcasting Company (NBC). It broadcast its first radio programs in 1926.

By the 1930s it was possible to send a picture as well as a sound signal over radio waves. This was the beginning of television (TV). In 1936 the British Broadcasting Corporation (BBC) started the world's first TV programming. Now television signals may travel as radio waves or through cables.

Today the Internet makes it possible for people around the world to communi-



Short-wave, microwave, cellular telephone, and other types of telecommunication antennas receive and send messages from high ground near Phoenix, Arizona.

cate through computers. The U.S. government developed an early form of the Internet in the 1960s and 1970s. Telephone wires, television cables, fiber-optic cables, and satellites connect computers around the world to the Internet.

► More to explore

Communication • Internet • Radio
• Telegraph • Telephone • Television

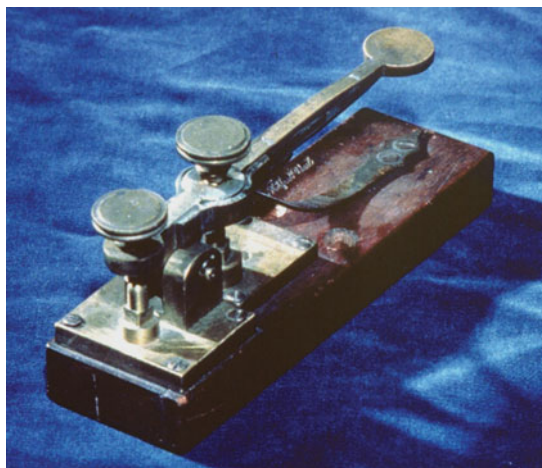
Telegraph

The telegraph is a device for communicating over a distance. It uses electricity to send coded messages through wires. In the middle of the 1800s the telegraph was the fastest way to communicate over long distances.

Invention of the Telegraph

The first two working telegraphs were invented at about the same time in the 1830s. In Great Britain two inventors built a telegraph that used six wires and five needles. A part called the transmitter sent electric currents through the wires. At the other end, the currents moved needles on a part called the receiver. The receiver had a special plate with letters and numbers on it. The needles pointed to the letters and numbers to spell out messages.

Meanwhile, in the United States, Samuel F.B. Morse worked on a telegraph of his own. Morse developed a new system for sending telegraph messages. It used dots, dashes, and spaces to stand for letters and numbers. This system is called Morse Code. Morse and his part-



The telegraph invented by Samuel F.B. Morse had a key for tapping out messages.

ner, Alfred Vail, built a telegraph with just one wire. The transmitter had an arm called a key. The person sending the message pressed the key to tap out messages in Morse Code.

In 1843 the U.S. government paid Morse to build the first long-distance telegraph line. It ran 35 miles (60 kilometers) from Washington, D.C., to Baltimore, Maryland. The next year Morse sent the first message through the system. The message was “What hath God wrought!”

The Telegraph Industry

Morse’s telegraph started an entire industry. By the end of 1861 a telegraph line ran all the way across the United States. By the end of the 1800s telegraph lines crisscrossed the world. In the early 1900s a new kind of telegraph could print out messages. Later telegraphs could send messages through the air instead of through wires. The wireless telegraph was an early form of radio. By the end of the 20th century the tele-

graph had been mostly replaced by faster communications that used computers.

► More to explore

Electricity • Morse Code • Radio
• Telecommunication

Telephone

The telephone is a very common device for communicating over a distance. With a telephone, a person can talk almost instantly with someone on the other side of the world. Most telephones are linked to each other by wires. Others, such as cell phones, are connected by invisible radio waves that travel through the air.

How a Traditional Telephone Works

A traditional telephone depends on wires to send sound. It has a handset and a base that are connected by a cord. The handset is the part that a person holds to make or answer a call. One end of the handset has a microphone for talking. The other end has a small loudspeaker for listening. The base connects the telephone to an electric current through a wire.

When the caller speaks into a telephone, the microphone changes the sound of the person's voice into an electric signal. The base sends out the signal through its wire. How the signal travels from there depends on where the call is going. It can remain an electric current, passing through wires and cables. It can travel through thin glass fibers in the form of

light. This way of sending information is called fiber optics. Or the signal can be changed into radio waves and sent through the air by antennas and satellites. When the signal reaches the telephone at the other end, its loudspeaker changes it back into the sound of the caller's voice.

Cordless Telephones

A cordless telephone is more convenient than a traditional telephone. It does not have a cord connecting the handset and the base. It allows a person to walk around the house while talking.

A cordless telephone uses both electric signals and radio waves. The base receives the call as an electric signal, like a corded phone does. Then the base turns the electric signal into radio waves. Using an antenna, the base sends the waves through the air to the handset. The handset's antenna picks up the waves. Then the handset turns the waves back into sound.

Cell Phones

Cellular telephones, or cell phones, are even more convenient than cordless phones because they work over a much wider area. Because of this, in some places they are called mobile phones. They send and receive calls using radio waves.

Cell-phone companies divide up an area, such as a city, into sections called cells. Each cell has a tower for receiving and sending out radio waves. If a caller travels from one cell into another, the call switches from tower to tower. This means that a cell phone can work any-

Did You Know?

The word telephone comes from the Greek words *tele*, meaning "far" and *phone*, meaning "sound."

How a Phone Sends and Receives Sound



place that the cell-phone company's network reaches. Cell-phone networks can stretch across an entire country.

A cell phone sends out a special signal whenever it is turned on. The signal lets the network know where to send the calls that come to that phone.

Many cell phones can do things other than make calls. Certain kinds can get information from the Internet or send and receive e-mail. Some cell phones can take photographs.

History

Not everyone agrees who invented the telephone. However, Alexander Graham Bell usually gets the credit. In 1876 he sent the first words by telephone. Later that year Bell made the first long-distance call. He talked with his assistant, who was 2 miles (3.2 kilometers)

away. By 1915 people could place telephone calls across the United States. Telephone service across the Atlantic Ocean began in 1927. The first cell phones appeared in the late 1970s.



Telephones had no dials in the first part of the 1900s. Instead of dialing, callers told a telephone operator the number they wanted to call.

At about the same time advances in electronics made telephones useful for more than just talking. Fax machines became common in the 1970s. They use telephone wires to send words and pictures. Today many computers connect to the Internet through telephone lines.

► More to explore

Bell, Alexander Graham • Electricity
• Fiber Optics • Radiation • Satellite
• Sound • Telecommunication

Telescope

A telescope is an instrument that allows people to see distant objects. Telescopes are important tools in astronomy, or the study of planets, stars, and other objects in outer space. There are several different types of telescopes. Some, called light telescopes, gather light from objects. Other telescopes gather different kinds of information about the object being viewed.

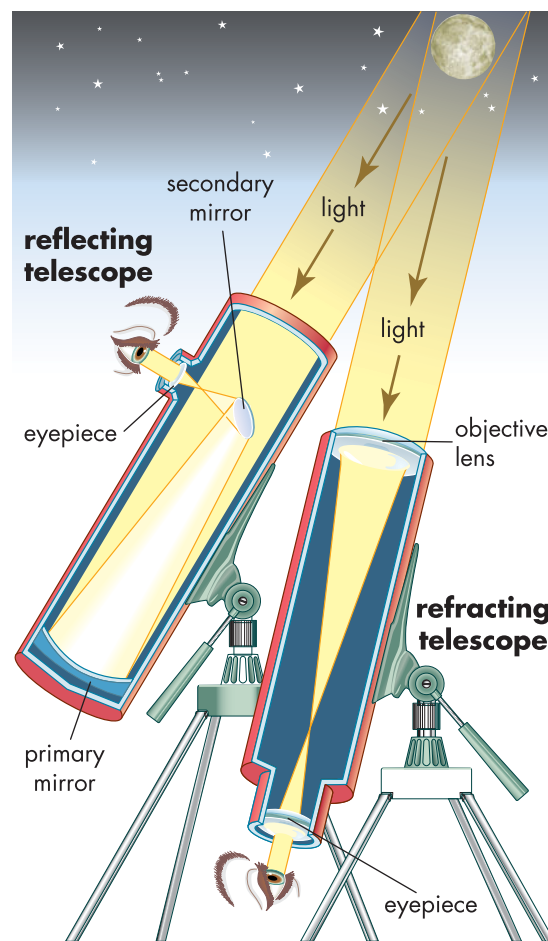
Did You Know?

The telescope forever changed people's understanding of the universe. It allowed people to see things that they could only guess about before.

Light Telescopes

There are two basic types of light telescopes: refracting telescopes and reflecting telescopes. A refracting telescope uses lenses. A lens is a curved piece of glass that refracts, or bends, light. A reflecting telescope uses mirrors. Some telescopes use both lenses and mirrors.

A refracting telescope is a tube with one or more lenses at each end. Light from a far-off object enters the far end of the tube. The lens or lenses at that end, called objective lenses, bend the light. They focus it at a point near the other



A refracting telescope uses lenses to enlarge an image. A reflecting telescope uses curved mirrors and sometimes lenses as well.

end of the tube. The light forms an image, or picture of the object, at this point. The lens or lenses at this end, called the eyepiece, magnify the image.

Reflecting telescopes are much more powerful than refracting telescopes. A reflecting telescope has a curved mirror at the bottom of the tube. Light from an object reflects, or bounces, off the mirror. The mirror focuses the light at a point in the tube. A second mirror sits in the way of this focused light. It sends the light out the side of the tube, through an eyepiece. A lens in the eyepiece magnifies the image formed by the light.

In some reflecting telescopes light passes through a lens before hitting the curved mirror. The lens helps to make the image sharper.

Some light telescopes are fairly small tubes that sit on a stand and can be carried around easily. Buildings called observatories house much larger, more powerful light telescopes. Spacecraft may also carry light telescopes. The Hubble Space Telescope, which orbits Earth on a spacecraft, is a type of reflecting telescope.

Other Telescopes

Some types of telescopes do not collect light. These telescopes collect other forms of energy from space—for example, radio waves, infrared radiation (a type of heat), and X-rays. Planets, stars, gas, and other things in space give off these types of energy.

Radio telescopes look like huge bowls. They collect radio waves that travel to Earth's surface. Infrared, X-ray, and other similar telescopes are mounted on spacecraft.

All these telescopes allow scientists to gather information about things in space that cannot necessarily be seen. For example, they have shown that there is water vapor in other parts of the Milky Way galaxy. They have also helped scientists understand how stars and planets form and how stars die.

History

By the early 1600s several people had made simple refracting telescopes. In



The Very Large Array is a group of 27 bowl-shaped radio antennas in the state of New Mexico. Each antenna is 82 feet (25 meters) across. When used together they make one very powerful radio telescope.

1609 the Italian scientist Galileo improved the design of a telescope made by a Dutch inventor. Later in the 1600s several inventors, including the English scientist Isaac Newton, built reflecting telescopes.

A U.S. astronomer built the first radio telescope in 1937. Other scientific telescopes developed along with spacecraft, which scientists began launching in the 1950s.

► More to explore

Astronomy • Galileo • Lens • Light
• Mirror

Television

Television, or TV, is a system for sending moving pictures and sound from one place to another. It is one of the most important and popular forms of communication. TV programs provide news, information, and entertainment to people all over the world.



People who own plasma TVs often hang them on a wall. Plasma TVs are thinner and lighter than standard TVs.

How TV Works

TV begins with a television camera, or video camera. The camera records the pictures and sound of a TV program. It changes the pictures and sound into electric signals. A TV set receives the

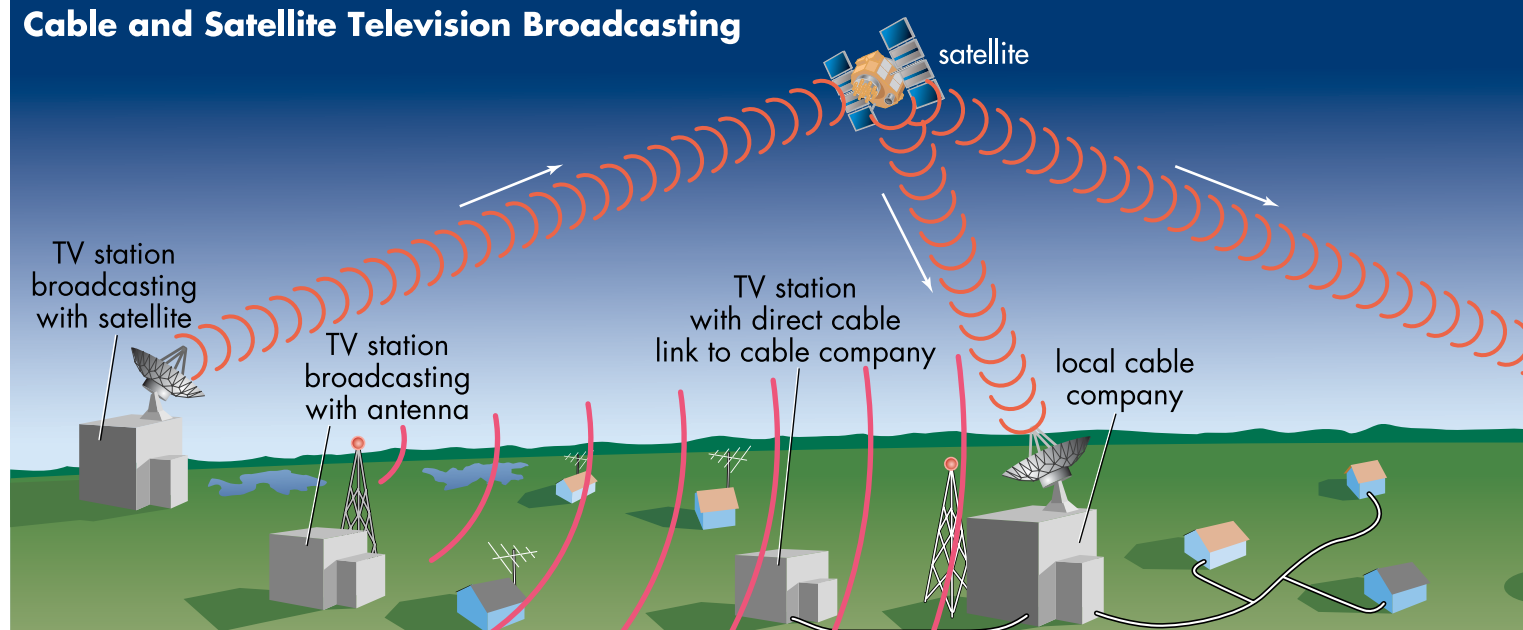
signals and turns them back into pictures and sound.

The TV Signal

A standard TV camera changes the pictures into an electric signal called the video signal. The video signal carries the pictures in the form of tiny dots called pixels. The camera's microphone changes the sound into another electric signal, called the audio signal. The video and audio signals together form the TV signal.

Digital TV, or DTV, is a newer way of handling TV signals. A digital TV signal carries pictures and sound as a number code, like a computer does. A digital signal can carry more information than a standard signal can, which creates better pictures and sound. High definition TV, or HDTV, is a high-quality form of digital TV.

Cable and Satellite Television Broadcasting



Television stations may broadcast, or send, TV signals with antennas, satellites, or cables. The signals sent with antennas may reach houses directly.

A TV signal can reach a TV set in several ways. Local TV stations use antennas to send, or broadcast, signals through the air as radio waves. Cable TV stations send signals through underground cables. Satellites, or spacecraft, traveling high above Earth can send signals to special antennas called satellite dishes. A signal can also come from a VCR, DVD player, or DVR (digital video recorder) connected to the TV set. VCRs, DVRs, and some DVD players can record a TV signal coming into the TV and then play it back later.

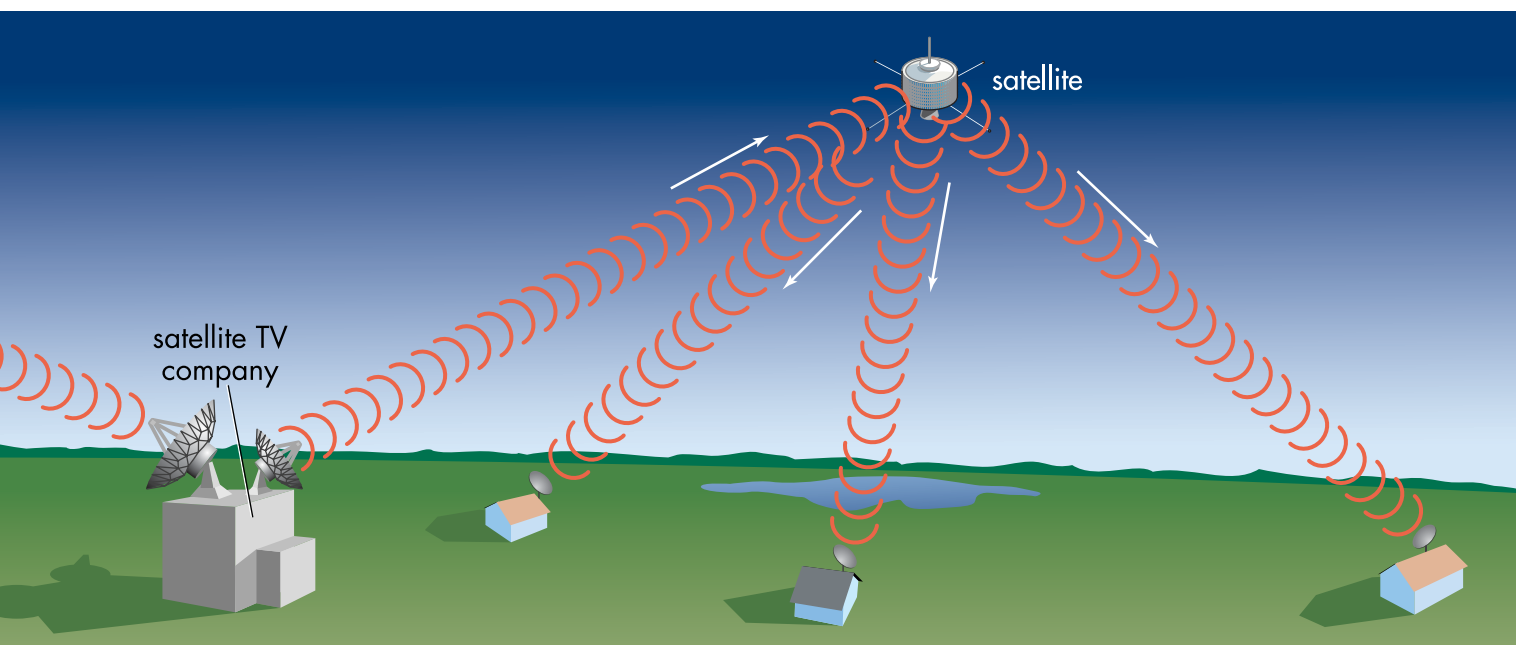
Display

A standard TV set turns the video signal into beams of tiny particles called electrons. It shoots these beams at the back of the screen through a picture tube. The beams “paint” the pixels on the screen in a series of rows to form the picture. The TV set sends the audio signal to loudspeakers.

LCD and plasma TVs form the picture differently. They do not use a picture tube and electron beams. Because they do not hold a picture tube, LCD and plasma TVs are much thinner and lighter than standard TVs. They can even hang on a wall.

LCD stands for liquid crystal display. Liquid crystal is a substance that flows like a liquid but has some tiny solid parts, too. The display sends light and electric current through the liquid crystal. The electric current causes the solid parts to move around. They block or let light through in a certain way to make the picture on the screen.

A plasma display has many tiny cells, or units, containing gas. Electricity sent through the gas forms a plasma. A plasma is a bunch of particles that have an electric charge. The plasma gives off light, which makes the picture.



Signals sent through satellite or cables go first to a cable or satellite TV company. Those companies then send the signals to homes through other cables or satellites.

History

Inventors in Great Britain and the United States made the first demonstrations of TV in the 1920s. The first working TV sets appeared in the 1930s. In 1936 the British Broadcasting Corporation (BBC) started the world's first TV programming. The first commercial television stations in the United States started broadcasting in 1941.

Many families bought their first TV set after World War II, in the late 1940s and the 1950s. The first sets could show only black-and-white pictures. Color TV and cable TV started in the 1950s. Digital TV arrived in the 1990s.

► More to explore

Camera • Electronics • Radio
• Telecommunication

Temple

A temple is a building that people use for worshipping gods or for other religious purposes. The houses of worship in many ancient religions were called temples. Hinduism, Buddhism, and

several other religions today also have temples. The architecture of temples varies from place to place.

The temples of ancient Mesopotamia (in what is now Iraq) were highly decorated towers called ziggurats. They were shaped like pyramids with large steps. In ancient Egypt temples often had large, decorated columns. In the Americas the Inca and the Maya built pyramid-shaped temples.

The ancient Greeks and Romans built temples that have influenced architecture until the present day. A Greek temple was made of marble or stone. It had columns that enclosed a space holding an image of a god. An altar to that god stood outside the temple. Roman temples were similar, but the altar was inside the temple.

Hinduism and Buddhism began in ancient India. People there carved temples out of cliffs. Later Indian temples were freestanding. They often included tall, elaborately carved towers. Today Hindu and Buddhist temples throughout eastern Asia range from small and simple to huge and complex.

Other religions that have temples include Shinto and Jainism. Jewish synagogues are often called temples, too. Islamic temples are called mosques. Christian houses of worship generally are known as churches. However, Mormons (followers of the Church of Jesus Christ of Latter-day Saints) have temples for special religious ceremonies.

► More to explore

Church • Mosque • Synagogue



Buddhist monks walk past a Buddhist temple in Bangkok, Thailand.

Tennessee



The Great Smoky Mountains lie in the eastern part of Tennessee.

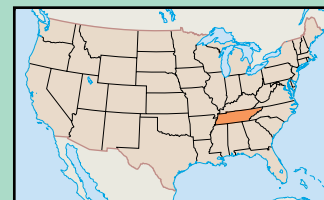
The name Tennessee comes from a Cherokee Indian word, Tanasi. Tanasi was the name of a major Cherokee village in the area. Tennessee is known as the Volunteer State. The nickname came from the large number of men who volunteered for military service in the War of 1812. The capital is Nashville.

Geography

Tennessee is located in the south-central part of the United States. It borders eight states. In the west the Mississippi River separates Tennessee from Missouri and Arkansas. Virginia and Kentucky lie to the north of Tennessee. Mississippi, Alabama, and Georgia are to the south. In the east Tennessee shares a border with North Carolina.

Eastern Tennessee lies within the Appalachian Mountain chain. The Blue

Ridge Mountains along the Tennessee–North Carolina border include the range known as the Great Smoky Mountains. West of the mountains is an area of low ridges. The central part of the state is a region with generally flat but sometimes rolling land. Western Tennessee consists of plains, including a narrow strip of swamp and floodplain along the Mississippi River.



Tennessee has a moderate climate. Winters are cool and summers are warm.

People

Most of Tennessee's early white settlers came from the Eastern states. These people were mainly English, Scots-Irish, and German. Today about four fifths of the Tennessee population is white and of European heritage. African Americans are by far the largest minority group; they represent 16 percent of the state's population.

Economy

Manufacturing and service industries dominate Tennessee's economy. The state's factories produce motor vehicles



**Facts About
TENNESSEE****Flag****Population**

(2000 census)
5,689,283—
rank, 16th state;
(2008 estimate)
6,214,888—
rank, 17th state

Capital

Nashville

Area

42,143 sq mi
(109,151 sq
km)—rank, 36th
state

Statehood

June 1, 1796

Motto

Agriculture and
Commerce

State bird

Mockingbird

**State flower**

Iris



and parts, processed foods, chemicals, and many other products.

Leading service industries include health care, real estate, and tourism. Tourists visit Tennessee's natural wonders, such as the Great Smoky Mountains. Civil war battlefields and the musical attractions located in Memphis and Nashville are also popular. Tennessee's major agricultural products include cattle, chickens, greenhouse plants and produce, and dairy goods.

History

Native Americans including the Cherokee and the Chickasaw lived in the area that is now Tennessee before European settlers arrived. In the second half of the 1600s both the French and the English claimed the area. Settlers from both countries built forts and trading posts. In 1763 Britain took control of the whole area.

The first permanent white settlement in the region was started in 1769. Many other people from the American colonies followed. In 1796 Tennessee became the nation's 16th state.

The American Civil War (1861–65) divided Tennessee. The eastern part of the state sided with the North, but the western planters and slave owners supported the South. Tennessee battlefields at Shiloh and other places were sites of intense fighting during the war.

In 1933 the United States government created an agency called the Tennessee Valley Authority (TVA). Under the

TVA, new dams and hydroelectric power plants were built on Tennessee rivers. The dams and power plants helped control floods and generated electricity for the region.

Tennessee was a center of the civil rights movement in the 1950s and 1960s. Tragically, Memphis was the scene of the 1968 killing of civil rights leader Martin Luther King, Jr. In the 1990s the population of Tennessee increased faster than that of the United States as a whole. Tennessee's economy also grew during this period. The state supported this growth by encouraging the development of many different types of industry.

► More to explore

Cherokee • Nashville



The Cumberland River reflects the skyline of Nashville, the second largest city in Tennessee. The BellSouth Building is topped by two spires. It was the tallest building in the state when it was built in 1994.

Tennis

Tennis is a fast-paced sport for two or four players. It can be played either outdoors or indoors. Tennis players use a stringed racket to hit a ball over a net. They score points by hitting the ball out of the opponent's reach.

Court and Equipment

Tennis is played on a rectangular court. The court is 78 feet (23.8 meters) long. The width depends on whether there are two or four players. For a singles match (two players), the court is 27 feet (8.2 meters) wide. For a doubles match (four players), the court is 36 feet (11 meters) wide. The surface of the court may be grass, clay, or a hard material such as concrete. The court is divided in half by a net that is 3 feet (0.9 meter) high.

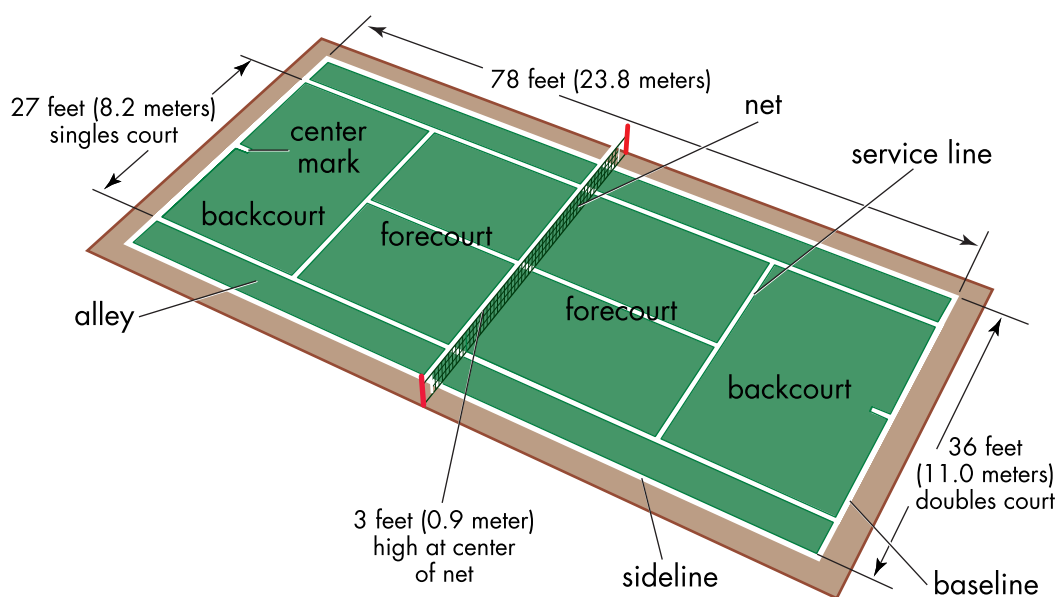
The only equipment needed for tennis is a racket and a ball. A tennis racket has a

frame with crossed strings attached to it. Most racket frames are made of a lightweight material such as graphite. Tennis balls are small, light, and bouncy. They are usually yellow or white.

Playing the Game

A tennis game begins with a serve. One of the players, called the server, stands at one end of the court. The server throws the ball into the air and tries to hit it over the net. The opponent tries to return the serve—hit the ball back over the net. The players hit the ball back and forth until one of them fails to make a good return. Then the other player scores a point. The players try to hit the ball to a part of the court where the opponent will have a hard time returning it.

The serve is the most important stroke in tennis. The served ball must land in a boxed area on the opponent's side of the



A tennis court is 78 feet long. Its width depends on how many people are playing. In a singles match, or a match for two players, the court does not include the alleys. The alleys are used only for doubles matches, in which four people play. The alleys make the court wider.



Doubles tennis is played with two players on a side. A doubles court is slightly wider than a singles court.

court. If the ball misses that box, it is called a fault. The server then gets another chance to serve. If the server makes another fault, the opponent gets a point. On the other hand, the server earns a point by serving the ball so well that the opponent cannot hit it. This is called an ace.

A player needs four points to win a game. Points are counted in four stages: 15 for the first point, 30 for the second, 40 for the third, and game. A score of zero is called love. The server's score is given first. For example, if the score is 30–love, the server has two points and the opponent none. If both players reach 40, the score is called deuce. The player who scores the first point after deuce must also get the next point to win the game. In other words, a player must win by two points.

A series of games makes up a set, and a series of sets makes up a match. The first player to win six games traditionally wins a set. But again, a player must win by two. This means that a player cannot win a set by a score of 6–5. The set con-

tinues until one player wins by two games—for example, 7–5 or 8–6. To win a match, a player usually has to win either two out of three or three out of five sets.

History

Major Walter Clopton Wingfield of Great Britain published the first book of tennis rules in 1873. The first tennis championship took place four years later. It was held in a part of London, England, called Wimbledon. Tennis reached the United States in the 1870s.

Four major international tennis tournaments take place each year—one in Australia, one in France, one in the United Kingdom, and one in the United States. A player who wins all four is said to have won the Grand Slam.

Tenzing Norgay

Tenzing Norgay was an expert mountain climber. In 1953 he and Edmund Hillary of New Zealand became the first people to set foot on top of Mount Everest, the world's tallest peak.

Tenzing Norgay was born on May 15, 1914, in Tshechu, Tibet. He was a Sherpa. Sherpas are people known for their strength and endurance at high altitudes. Tenzing worked on many Everest expeditions. On March 10, 1953, he began climbing with a group that included Hillary. The two men reached the top on May 29. Tenzing left a food offering, a common practice in

his Buddhist religion. He died on May 9, 1986, in Darjeeling, India.

► More to explore

Everest, Mount • Hillary, Edmund

Teresa, Mother

The Roman Catholic nun called Mother Teresa received the Nobel peace prize in 1979 for helping to relieve the sufferings of the poor. She was especially active in the slums of Calcutta (now Kolkata), India.

She was born on August 27, 1910, in Skopje, Macedonia. Her birth name was Agnes Gonxha Bojaxhiu. In 1928 she joined a community of nuns in Ireland called the Sisters of Loretto. Weeks later she sailed to India. For the next 17 years she taught at a school in Calcutta run by the Sisters of Loretto.



Mother Teresa

In 1946 Mother Teresa decided to spend her life helping the sick and the poor. She studied nursing and started working in the slums. In 1948 she founded the Missionaries of Charity, a religious order of women dedicated to serving the poor. Mother Teresa led the order for nearly 50 years. It opened schools for children and centers to treat the blind, the disabled, the old, and the dying. She received many awards for her work.

In 1989 Mother Teresa suffered a heart attack. Despite her poor health, she continued to work in Calcutta most of the time until she retired in March 1997. She died there on September 5, 1997. After her death, the Missionaries of Charity carried on her work in more than 90 countries.

► More to explore

Roman Catholicism

Termite

Termites are insects that eat wood. They can damage buildings, furniture, and other wooden items. There are more than 1,500 species, or kinds, of termite. They are most common in tropical rain forests.

Termites build damp nests in wood or underground. Some underground nests rise partly above the ground as mounds or towers. The nests are made of dirt, clay, and chewed wood.

Termites live in organized groups called colonies. Each colony has three kinds of

Did You Know?

In 1963 the Indian government awarded Mother Teresa the title Padmashri ("Lord of the Lotus") for her services to the people of India.



Termites eat their way through a piece of wood.

termite: royalty, soldiers, and workers. Each kind of termite has a certain job within the colony.

The royalty is made up of a king and queen. They are responsible for reproduction. These termites have wings and eyes. A queen can grow to more than 4 inches (10 centimeters). Kings are smaller.

Once a year pairs of young kings and queens leave the nest. Each pair starts a new colony. Soon the young queens begin laying 3,000 to 5,000 eggs a day.

The soldiers and the workers are grayish white, blind, and wingless. They are usually less than 0.25 inch (1 centimeter) long. Soldiers guard the nest against enemies, mainly ants. Workers provide the colony with food.

Termites eat mostly wood. They attack and often destroy trees, fence posts, houses, and furniture. But termites also help nature by breaking down dead wood into nutrients. The nutrients can

then be recycled and used by bacteria and plants.

► More to explore

Insect • Nest

Terrorism

Terrorists are people who use fear to try to change society. They create fear by committing violent crimes. In the 21st century many countries consider terrorists to be more dangerous than enemy armies.

Goals

Not all terrorists want the same thing. Some want to overthrow a government. They are called revolutionary terrorists. Examples include the Red Brigades in Italy in the 1970s and the Shining Path in Peru in the 1980s and 1990s. Both groups wanted to establish Communist governments.

Other terrorists want independence for a particular group. In Sri Lanka a group called the Liberation Tigers seeks a homeland for the Tamil people. Several Palestinian groups want to start a Palestinian state in the Middle East and to weaken or destroy Israel.

Some terrorists oppose minority groups. The Ku Klux Klan (KKK) was formed in the United States in the 1860s to prevent African Americans from voting. Later the KKK also targeted Catholics, Jews, and other groups.

Sometimes the rulers of a country practice another kind of terrorism by killing

their own citizens. Such rulers want to make people afraid to go against their power. Joseph Stalin of the Soviet Union and Saddam Hussein of Iraq ruled by terror.

Methods and Weapons

Terrorists often use bombs. They might carry bombs in cars, in packages, or on their bodies. They might also send bombs in packages. People called suicide bombers intend to die when they set off their explosives.

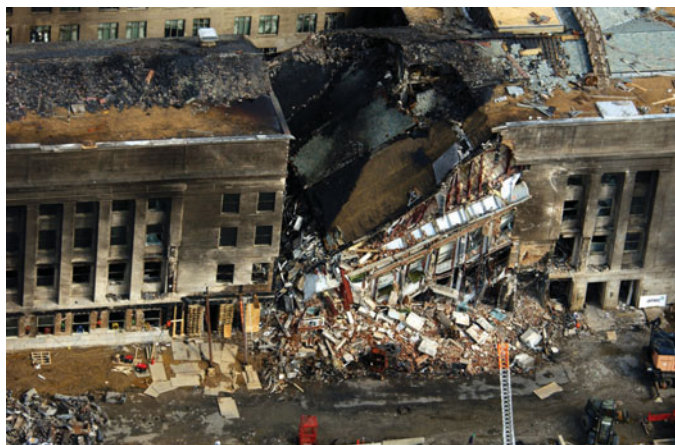
Terrorists can also release chemicals or other harmful substances. In 1995 a Japanese group released poison gas into the subway system in the city of Tokyo. Twelve people were killed. In 2001 five people died in the United States after someone mailed letters containing the disease anthrax.

Terrorists also kidnap or assassinate (murder) leaders. Or they might hijack, or seize, boats or airplanes. Sometimes they hold the passengers as hostages until their demands are met.

History

The word terrorism was first used in the French Revolution, which began in 1789. It described the way some of the revolutionary leaders punished those who opposed their actions.

In the late 1800s people called anarchists started to use terrorism. Anarchists want to do away with all government. An anarchist killed U.S. President William McKinley in 1901.



Terrorists crashed an airplane into the Pentagon, near Washington, D.C., on September 11, 2001. The Pentagon is the headquarters of the U.S. Department of Defense.

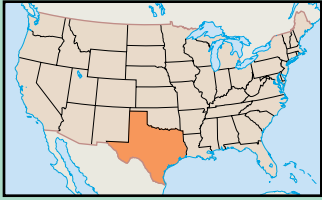
Anarchists also killed several European leaders.

In the 1900s more groups used terrorism than ever before. One reason is that deadly weapons became easier to get. Another reason is that airplane travel gave terrorists new ways to commit violence. Many of the groups that used terrorism had political goals. Others had very strong religious beliefs.

In September 2001 members of a group called al-Qaeda hijacked four airplanes in the United States. They crashed three of them into buildings. Their targets included the World Trade Center in New York City and the Pentagon, near Washington, D.C. It was the deadliest terrorist act up to that time. About 3,000 people were killed. Soon afterward U.S. President George W. Bush declared a “war on terror.”

► More to explore

Crime • Ku Klux Klan



Texas

Texas was an independent nation before becoming part of the United States. It had won freedom from Mexico in 1836. Nine years later on December 29, 1845, Texas was admitted to the Union. Its national flag then became its state flag. This red, white, and blue flag with a single star was the origin of the Texas nickname, the Lone Star State. Austin is the capital.

Geography

Texas is located in the south-central part of the United States. The river called the Rio Grande separates Texas from the country of Mexico on the southwest. The Gulf of Mexico lies to the south-



The Guadalupe Mountains National Park in western Texas features rugged mountains surrounded by a desert.



east. East of Texas are Louisiana and Arkansas. New Mexico is to the west, and Oklahoma is to the north.

The landscape of Texas consists mainly of plains and hills. The largest natural region is the coastal plain that covers southern and eastern Texas. It consists of flat, low prairies that stretch far inland from the Gulf of Mexico. In the central and west-central parts of the state are raised plateaus and hill country.

The Texas panhandle is a block of land that extends northward above the rest of the state. It is a flat, dry area with frequent sandstorms. The eastern edge of the panhandle and the north-central part of the state are lowland regions of

prairie and rolling plains. The most rugged, mountainous land in Texas lies in the far west.

People

During the late 20th century Texas was one of the fastest-growing states in the country. Texas is now second in population only to California. Three of its urban centers—Houston, Dallas, and San Antonio—are ranked among the country's 10 most populated cities.

Whites of European heritage represent more than half of the state's residents. Hispanic Americans, mostly of Mexican origin, make up almost a third of the population. About 12 percent of the people are African American.

Economy

The Texas economy is among the largest in the country. Major parts of the economy include commercial trade, real estate, and finance. Tourism is also valuable to the state. About 40 million people visit the state each year.

The state's top manufacturing industries are in the field of high technology. These industries include the production of

computers and electronic products.

Texas is the home of Dell, a major computer company. Another company in the state, Texas Instruments, is a major producer of electronic goods and military equipment. Oil production and the manufacture of chemical and petroleum (oil) products also contribute to the state's economy.

In agriculture, Texas ranks first in the country in the production of cattle. Other valuable farm products include cotton and chickens.

History

Native Americans lived in the Texas region before Europeans arrived. Early tribes included the Caddo, the Jumano, and others. Later the Comanche moved into the area.

The Spanish began to explore the Texas region in the early 1500s. In 1685 the French explorer Sieur de La Salle started a settlement along the Texas coast. It did not last long, but it did make the Spanish move more quickly to build settlements of their own. San Antonio was founded in 1718 and became the main settlement of Spanish Texas.



Sand dunes stretch along an island off the coast of Texas in the Gulf of Mexico.

Facts About TEXAS

Flag



Population

(2000 census)
20,851,820—
rank, 2nd state;
(2008 estimate)
24,326,974—
rank, 2nd state

Capital

Austin

Area

268,581 sq mi
(695,621 sq
km)—rank, 2nd
state

Statehood

December 29,
1845

Motto

Friendship

State bird

Mockingbird



State flower

Bluebonnet



When Mexico declared its independence from Spain in 1821, Texas became part of Mexico. During this period, Mexico allowed pioneers from the United States to enter the territory and set up colonies. Stephen F. Austin brought the first group of colonists to a site along the Brazos River. Austin is often called the Father of Texas.

Texans soon became unhappy with the Mexican government. In 1835 they revolted, and the next year they declared independence. In the most famous battle of the Texas war for independence, the Texans fought heroically to defend a mission called the Alamo. They lost at the Alamo, but they eventually defeated the Mexicans at a battle along the San Jacinto River. Texas became an independent republic in 1836. Sam Houston, the leader of the war, was elected its first president.

In 1845 Texas was admitted to the United States as the 28th state. Like other Southern states, Texas allowed slavery at that time. It joined the Confederacy during the American Civil War (1861–65). Although Texans fought for the South, the state itself was far removed from the major battlefields.

After the war Texas cowboys began driving cattle northward to markets or ranges. This vital industry led to the popular image of the cowboy in song, story, and film. The great cattle drives continued until about 1890.

The state's oil industry owes much to a place named Spindletop. Located near



Restaurants and cafés draw many people to the section of San Antonio, Texas, known as the River Walk.

Beaumont, Spindletop became the state's first great oil well in 1901. Numerous other wells followed. A huge oil field in eastern Texas was discovered in 1930.

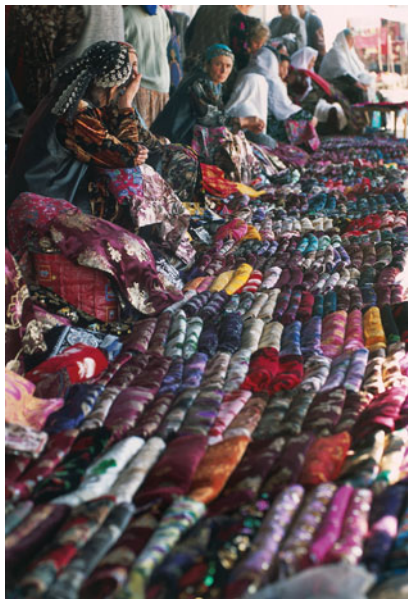
On November 22, 1963, U.S. president John F. Kennedy was shot to death in Dallas. The vice president, Texas politician Lyndon B. Johnson, became the country's next president.

Another politician from Texas, George Bush, served as the country's president from 1989 to 1993. His son George W. Bush was elected president in 2000 and reelected in 2004. The Bushes were only the second father and son to both serve as president (the first were John Adams and John Quincy Adams).

► More to explore

Alamo • American Civil War • Austin

Textile



Merchants in the country of Uzbekistan display many kinds of colorful cloth for sale.

The word textile commonly means woven or knitted cloth. Lace, felt, and many other kinds of cloth are considered textiles, too. Even nets, rope, and yarn may be called textiles. People use textiles to make clothing, towels, sheets, table linens, carpets, boat sails, flags, and many other things.

Textile production is one of the world's major industries. Factories throughout the world produce many tons of textiles every year. But people still create textiles in small shops and at home as well.

Making Textiles

To create textiles, people first make thread or yarn out of fibers. Some fibers are natural—for example, cotton, wool, linen, and silk. Others are artificial, or man-made—for example, nylon and polyester. Then people weave, knit,

knot, loop, or braid the thread or yarn together. These processes may be done by hand or by machine. People also may make textiles by pressing or gluing fibers together.

People often dye the thread or yarn before making it into textiles. They also may dye or print designs on cloth after it is made.

History

People have made yarn and woven cloth for thousands of years. Some of the world's oldest textiles have been found in ancient Egyptian tombs. Fragments of 3,000-year-old cloth also have been found in South America.

At first, people made cloth for themselves and their families. Eventually craftspeople took over the work and divided it into separate trades. Different workers spun the yarn, dyed it, and wove it into cloth. Other workers sold the cloth in shops. In the Middle Ages (about AD 500 to 1500) certain cities and regions became known for the kinds of textiles they made.

People made textiles by hand or with simple machines until the 1700s. Several inventions then made weaving faster. By the 1800s water and steam power ran many textile-making machines. Since that time, called the Industrial Revolution, textiles have been made mainly in factories.

► More to explore

Clothing • Fibers • Industrial Revolution

Did You Know?

Rayon was the first artificial textile fiber. It was first made in the 1800s.



Thailand

The local name for Thailand means “land of the free.” True to its name, Thailand is the only country in South-east Asia that was never ruled by European powers. Thailand’s capital is Bangkok.

Geography

Thailand is shaped like an elephant’s head. Narrow southern Thailand is the trunk, and the north is the head and the ear. Thailand shares borders with Myanmar, Laos, Cambodia, and Malaysia. The Andaman Sea, a part of the Indian Ocean, lies to the west. The Gulf of Thailand lies to the east.

Mountains and deep river valleys cover northern Thailand. The highest peak, Mount Inthanon, is 8,481 feet (2,585 meters) high. The mountains run down the western border into the south. The Chao Phraya is the country’s major river. It flows through plains in central



An unusual rock formation stands in a bay in southern Thailand.

Thailand. The northeast is a broad, flat area called the Khorat Plateau.

Winds known as monsoons affect Thailand’s climate. The winds bring a hot season, a rainy season, and a cool season.

Plants and Animals

Bamboo, coconut palms, mangroves, ferns, and mango and papaya trees grow in Thailand. Teak and other hardwood trees grow in the rain forests of the north.

Small numbers of wild elephants, rhinoceroses, and tapirs live in Thailand. Many monkeys and birds live in the forests. Lizards, frogs, snakes, and crocodiles are common.

People

Thai people make up most of the population. Chinese people form a smaller group. The country also has small

groups of Malays, Khmer, and others. Thai is the main language, but English is also widely spoken.

Almost all the people of Thailand follow Buddhism. Some people in the south, especially Malays, practice Islam. Most people live in rural areas.

Economy

Tourism is one of Thailand's largest industries. Manufacturing is another important part of the economy. Some of the major products are clothing, computers and other electronics, cement, sugar, and jewelry. Thailand is one of the world's largest producers of the metals tungsten and tin. The country's mines also provide coal, natural gas, and gems.

Many Thai people work in farming. The main crops include rice, sugarcane, cassava, and corn. Thailand also produces natural rubber, pineapples, and bananas. Pigs, chickens, and fish are other sources of food.

History

Thousands of years ago people in what is now Thailand grew rice and made metal tools. Between the AD 500s and 800s the Mon people set up small Buddhist kingdoms. By the 1100s the Khmer people of what is now Cambodia ruled parts of eastern Thailand.

Thai peoples moved into the area from China in about the 900s. In the 1200s they founded two kingdoms in what is now northern Thailand. The Sukhothai kingdom was founded after a local Thai ruler led a revolt against the Khmer. The



Tourists ride tame elephants in Thailand.

Lan Na kingdom was founded after another Thai ruler conquered a Mon kingdom.

In the 1300s the kingdom of Ayutthaya took the place of Sukhothai. The kingdom came to be known as Siam. Siam conquered Lan Na in the 1700s.

In 1782 a royal family called the Chakri dynasty came to power in Siam. During the 1800s Siam stayed independent while Europeans took over neighboring countries. In 1932 a military revolt ended the Chakri dynasty's absolute control over the country. Siam then became a constitutional monarchy. This means that the country still has a king from the Chakri dynasty, but his powers are limited. In 1939 the country became known as Thailand.

The military took control of Thailand in 1947. In 1973 students held protests that led to a more democratic government. But military leaders took power several times in the following years.

► **More to explore**
Bangkok • Buddhism

Facts About THAILAND



Population
(2008 estimate)
64,316,000

Area
198,117 sq mi
(513,120 sq km)

Capital
Bangkok

Form of government
Constitutional monarchy

Major cities
Bangkok, Samut Prakan, Nonthaburi, Udon Thani, Nakhon Ratchasima

Thames River



The Thames River has been the main waterway of England since the time of the ancient Romans. Compared to the great rivers of the world, the Thames is neither long nor mighty. Its importance comes from the great civilization that arose on its banks.

The Thames begins in the Cotswold Hills of central England. From there it



There are many important buildings along the Thames River. The group of buildings at left is the Houses of Parliament, in London, England. This is where members of the British Parliament meet.

winds about 210 miles (338 kilometers) from west to east. After passing the city of Oxford, it flows through the countryside and then into London. The many landmarks along the Thames in London include the Houses of Parliament, Saint Paul's Cathedral, the Tower of London, and the Millennium Dome. The Thames empties into the North Sea.

People have lived in the Thames Valley for thousands of years. Before railways and good roads were built, the Thames was the area's main trade route. Over time many industries were set up along the banks. Today millions of people depend on the river for water and for sewage removal.

► More to explore

England • River

Thanksgiving

Thanksgiving is a yearly holiday marked by feasts and family gatherings. The day is celebrated in the United States, Canada, and other countries. It takes place on the fourth Thursday in November in the United States. In Canada it occurs on the second Monday in October. Both countries celebrate Thanksgiving with turkey feasts. In the United States, Thanksgiving Day parades and football games have become important traditions as well.

The Pilgrims of the Plymouth colony held the first Thanksgiving in 1621. They had landed in America on their ship the *Mayflower* in December 1620. Only half of them survived that first



A family prepares to eat a turkey dinner together at Thanksgiving.

winter. The next year, the harvest in the fall was good. To celebrate their harvest, the colonists and their Native American guests enjoyed a three-day feast.

Sarah Josepha Hale, the editor of a popular women's magazine, led the effort to have Thanksgiving become a national celebration in the United States. In 1846 she started sending letters to important politicians in order to achieve her goal. Finally, in 1863, President Abraham Lincoln proclaimed a national day of Thanksgiving. In December 1941 Congress officially named the fourth Thursday in November as Thanksgiving Day.

Theater

A theater is a place where people go to see plays and other performances. The word theater can also refer to everything involved in producing a live staged performance. The most common form of theater is a drama, or play. A drama is a story that is acted out for an audience.

Other kinds of theatrical productions may feature elements other than a story. They include musicals, puppet shows, circuses, operas, and ballets and other dance performances.

Inside the Theater

The part of a theater where the actors perform is called the stage. The most common kind, called a proscenium stage, is like a room with three walls. The audience sits in an auditorium and views the production as though looking through the fourth wall. Some theaters have a thrust stage, which extends partly into the seating area. The audience sits on three sides of the extended section of a thrust stage. In an arena stage the audience surrounds the stage. An arena stage is also called theater-in-the-round.

Other important parts of the theater include the backstage area and the dressing rooms. There is also a booth where technicians control the lighting and sound.

People in Theater

Many people work together to create theater. In a play actors have the most visible roles. The main people behind the scenes are the producer and the director. As the play's main businessperson, a producer obtains and manages all the money. The director decides how the play will be brought to life. This involves overseeing the actors and the behind-the-scenes crew. The director also runs rehearsals, or practices. A playwright writes the script, which contains the words the actors say.

Did You Know?

The word theater comes from a Greek word meaning "a place for seeing."

Did You Know?

Actors who played gods in ancient Greek plays were sometimes hung from a crane so they could “fly” across the stage.

The stage manager oversees all behind-the-scenes activity during the production. The set designer creates backdrops and furniture. The property master manages the small items, or props, used onstage. Lighting experts focus light on the stage to concentrate on certain activity and to set a mood. The makeup artist and costume designer help the actors look their parts.

Other types of theatrical productions may involve other people with special talents. For example, in puppet theater various people design, make, and operate the puppets. In productions featuring dance a person called a choreographer may make up all the dance steps and movements. Musicians and composers may be a key part of productions that use music.

History

Early Theater

In ancient Greece plays were performed as part of special festivals. The audience sat on seats carved into the side of a hill overlooking the stage. Some ancient Greek theaters could seat as many as 20,000 people.

In Europe during the Middle Ages (AD 500–1500) plays were often related to Christianity. At first they were performed in churches. Later they were performed outdoors—on the church steps, on decorated platforms, or sometimes even in wagons.

In the 1300s a type of theater called Noh was developed in Japan. Noh plays

combine words, music, and dance to portray legends. Men or boys play all the parts, including the female characters. The actors do not act out scenes. Instead they use their movements and appearance as symbols to suggest the story. A Noh play takes place on a thrust stage. The stage has four pillars topped by a curving temple roof.

The Renaissance (1300s to 1500s) was a period of great artistic creation in Europe. The large theaters built then set the pattern for today’s theaters. Grand spectacles staged in these theaters were usually for the upper classes. The common people went to see groups of traveling actors perform comic entertainment outdoors.

In the late 1500s many theaters opened in London, England. The most famous was the Globe Theater, where William Shakespeare staged many of his plays. The Globe had a thrust stage that extended halfway into an open court-



In the 1600s many of William Shakespeare’s plays were performed at the Globe Theater in London, England. The theater was torn down in the mid-1600s, but it was rebuilt on almost the same spot in the 1990s.

yard. The common people stood in the courtyard. Wealthier members of the audience sat in seats. During Shakespeare's time women did not perform in plays. The female characters were played by men or boys who dressed as women.

Modern Theater

In Japan in the 1600s a new form of drama called Kabuki appeared. It focused on singing, dancing, and mime (movement without words). Actors in a Kabuki play wear striking costumes and makeup. They use elaborate gestures to show strong emotions. Kabuki is performed on a thrust stage. A narrow, raised platform extends through the audience from the stage to the back of the theater. The actors use the platform for dancing and for important entrances and exits. A female dancer developed Kabuki. But after the 1650s only men acted in the plays.

Kabuki is related to a form of Japanese puppet theater called Bunraku. In Bunraku the performers move around large dolls to act out a drama. One of the performers chants the words of the story. Puppet theater also has a long tradition in many other countries, including Indonesia, Turkey, India, and China. In Europe puppet shows presented favorite characters in entertaining stories.

In Europe during the 1600s many theaters began to use the proscenium, or arch, stage. This is the type of stage seen in many modern theaters.

Several actors in Europe and North America in the 1700s and 1800s



Bunraku is a Japanese form of puppet theater. The people who move the puppets appear on the stage with the puppets.

developed new ideas about acting. Before then actors often read their parts as if they were making a speech. The English actor David Garrick developed a more natural acting style. He delivered his lines in the spirit of the character he was playing.

In the 1800s New York City became the theatrical center of the United States, as London was in England. In the 1900s people began performing theater in a greater variety of places. More cities and towns around the world built new theaters.

► More to explore

Ballet • Circus • Dance • Drama • Opera



A crowd watches a play being performed at an outdoor theater in Kabul, Afghanistan.

Thimphu



Population
(2002 estimate)
45,000

Thimphu is the capital of Bhutan, a small country in south-central Asia. The city lies on the Raidak River in a valley of the Himalaya Mountains. It is a small city. It does not have the crowds and activity that many other capitals have.

Farming is the main economic activity in Thimphu. Farmers grow rice, corn, and wheat around the city. Thimphu has few industries. The leading industries process timber and make electricity from waterpower.

Little is known about the early history of Thimphu. The high mountains sur-



Farm crops grow close to an old Buddhist religious building that now houses the government of Bhutan. In the distance is the city of Thimphu.

rounding Bhutan long kept it separate from the rest of the world.

For hundreds of years Bhutan had no set capital. The center of government was wherever the king lived. In 1962, however, Thimphu was named the capital. The government then began making the city more modern.

► More to explore

Bhutan

Thistle

Thistles are prickly plants that most people think of as weeds. But some kinds of thistle have nice flowers, and people grow them as garden plants. One type of thistle is the national symbol of Scotland.

Thistles can grow to more than 8 feet (2.4 meters) tall. They usually have prickly leaves. The stem and flowers can also be prickly. The leaves usually have ragged edges. They are green or blue green and are sometimes covered with fine white hairs.

Thistles have many tiny flowers growing together in tight clusters. The flowers are packed so closely that the clusters look like single flowers. Most types of thistle can grow dozens of these flower clusters on one plant. The flowers are mostly pink, purple, or yellow. They produce feathery seeds that scatter in the wind.

Thistles grow mostly from seeds. Some thistles also can grow from small pieces of root in the soil. This makes thistles



The “flowers” of a thistle are actually clusters of many tiny flowers.

hard to remove from farm fields. Thistles are also hard to get rid of because their roots grow deep into the soil. Also, livestock and other animals do not eat thistles because they are so prickly.

► More to explore

Plant • Scotland

Thorpe, Jim

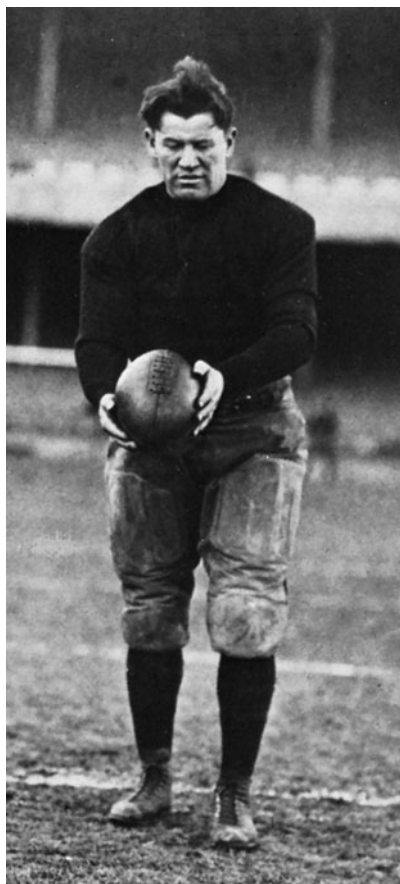
Jim Thorpe was one of the greatest all-around athletes in history. He excelled at football, baseball, basketball, boxing, lacrosse, swimming, and hockey.

James Francis Thorpe was born on May 28, 1888, in Indian Territory, which is now Oklahoma. He was mostly of Native American descent. Thorpe attended Carlisle Indian Industrial School in Pennsylvania. There he played

football under the famous coach named Pop Warner.

In 1912 Thorpe went to the Olympic Games in Stockholm, Sweden. He won gold medals in the decathlon and the pentathlon. (The decathlon is a track-and-field competition with 10 events. The pentathlon has five events.) But in 1913 Thorpe’s medals were taken away from him. It was found that Thorpe had played professional baseball in 1909 and 1910. A rule stated that professional athletes could not participate in the Olympics.

Thorpe played major league baseball from 1913 through 1919. Then, from



Jim Thorpe was a star player in the early days of American professional football.

1919 through 1926, he was an early star of American professional football. In 1920–21 he served as the first president of the organization that is now called the National Football League.

Thorpe died in Lomita, California, on March 28, 1953. The International Olympic Committee returned Thorpe's Olympic gold medals to his family in 1983.

Tibet



Tibet is a part of western China. It has some of the world's tallest mountains. Tibet is so high that it is often called the Roof of the World. The capital is Lhasa.

Most of Tibet is on a piece of land called the Plateau of Tibet. The plateau is a raised flat area about 15,000 feet (4,600 meters) above sea level. The Himalaya Mountains are to the south. Mount Everest, the world's highest peak, is on the border of Tibet and the country of Nepal. Tibet's climate is cold and dry.

Almost all the people of Tibet are Tibetans. Some Chinese also live there. Tibet-

ans speak the Tibetan language and practice their own form of Buddhism. The main leader of Tibetan Buddhism is called the Dalai Lama.

The economy of Tibet is based on farming. Tibetans raise yaks, horses, cows, sheep, and goats. They grow barley, wheat, millet, buckwheat, and potatoes. Tibetans also make handicrafts such as carpets, blankets, jewelry, and wooden bowls. A few factories produce textiles, machinery, chemicals, and other goods.

Tibet became a powerful Buddhist kingdom between the AD 600s and 800s. It came under the rule of the Mongols in the 1200s. In the 1700s the Qing, or Manchu, Dynasty of China took over Tibet.

The Qing Dynasty lost power in 1912. Then the Dalai Lama ruled Tibet. But in 1950 China again took control. The Tibetans rebelled against the Chinese in 1959, but they were defeated. The Dalai Lama fled to India. In the 1960s and 1970s the Chinese closed Buddhist monasteries and temples and destroyed



The Potala Palace in Tibet was once the home of the Dalai Lama.

religious writings. In the 1980s China began to allow some freedom in Tibet.

► More to explore

Buddhism • China • Dalai Lama
• Himalayas

Tick and Mite

Ticks and mites are tiny animals that are found all over the world. They are related to spiders. Many ticks and mites are parasites. This means that they live on or inside other animals, which are called hosts.

Ticks can be more than an inch (2.5 centimeters) long, but most are much smaller. They can be hard-bodied or soft. Most hard ticks live in fields or woods. Soft ticks generally live in the host's home or nest.

Mites live in water and soil, on plants, and as parasites on animals. Some are so small that people can see them only with a microscope. Others can be 0.25 inch (6 millimeters) long.

Ticks and mites develop in stages from an egg into an adult. Hard ticks start and end each stage on the ground. At the end of each stage they attach to a host, such as a rodent, dog, or person. They suck the host's blood for a few days and then drop to the ground. They can go months without a meal as they wait for a host.

Ticks and mites can be very harmful. They can spread diseases to people, animals, and plants. For example, the deer



An American dog tick perches on grass while it waits for a chance to attach itself to a dog or other mammal. The American dog tick can give humans a serious disease called Rocky Mountain spotted fever.

tick carries Lyme disease. Hard ticks can also give off nerve poisons that can paralyze or kill the host. Some mites cause itching and skin problems.

► More to explore

Lyme Disease • Parasite • Spider

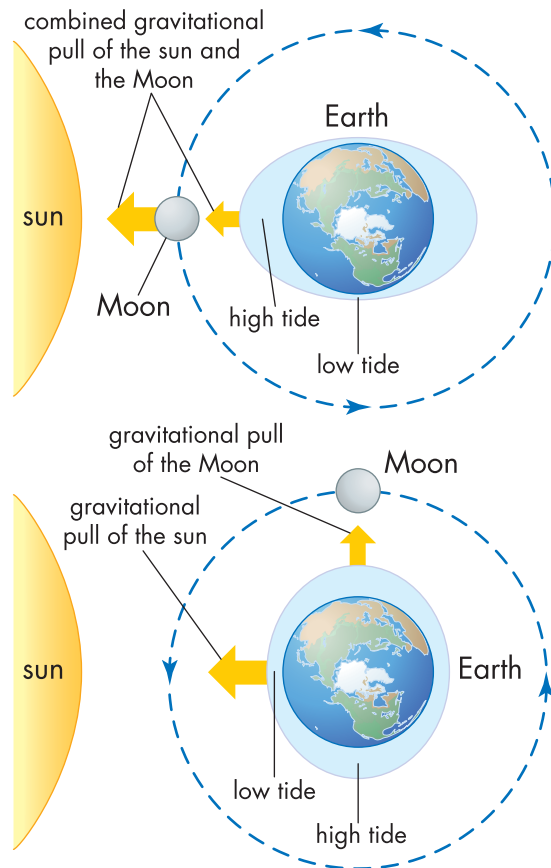
Tide

Along the coasts of every ocean on Earth the water level changes on a regular basis. This movement is known as the tide. The greatest height reached as the water rises is known as high tide. The lowest level reached as the water falls is known as low tide.

Tides take place in all bodies of water. In some waters, however, the change is so slight that tides go unnoticed. Tides are easier to see where an ocean meets land along seacoasts and in bays. There are

usually two high and two low tides per day at any given place. The times at which they happen, however, change from day to day. The average amount of time between two high tides is 12 hours and 25 minutes.

Tides are caused by a natural force called gravity. Because of gravity, all



Both the sun and the Moon pull on Earth's ocean water with a natural force called gravity. This pull creates tides. As the sun, Moon, and Earth move in space, they sometimes form a straight line, shown at top. This arrangement creates high tides that are higher than usual. It also creates low tides that are lower than usual. At other times the sun, Earth, and Moon are positioned like the corner of a square, shown at bottom. This arrangement evens out the tides more. It creates high tides that are less high than usual and low tides that are less low than usual.

bodies in the universe pull on each other. The sun and the Moon both pull on Earth, but the Moon has a greater influence because it is closer to Earth than the sun. As the Moon pulls on Earth it makes the water move. On the side of Earth near the Moon, the water builds up in a wave. Another wave forms on the other side of Earth. This is because the Moon is pulling Earth away from the water on that side. These waves result in high tide. As Earth rotates and the Moon moves around Earth, the tides change as well. Because the Moon moves around Earth in a regular path, the cycle of the tides follows a regular pattern.

► More to explore

Earth • Gravity • Moon • Sun

Tierra del Fuego

Tierra del Fuego is a group of islands at the southern tip of South America. About two thirds of the islands are in Chile, and the rest are in Argentina.

The name Tierra del Fuego is Spanish for “land of fire.” The explorer Ferdinand Magellan named the islands. When he sailed around the tip of South America in the 1500s, he saw many fires built by Indians along the coast.

A waterway called the Strait of Magellan separates the islands from mainland South America. The main island, called Tierra del Fuego, is triangular. The southern and western parts of the islands are mountainous.



Forests of beech trees grow in the middle of the main island.

Chile's only oil field is in the northern part of Tierra del Fuego. The islands have some textile and electronics companies. There is some logging in the forests. Tourism is a valuable industry, too.

The first people to live on the islands were the Ona, Yahgan, and Alacaluf Indians. Magellan sailed past the islands in 1520. Gold was discovered on Tierra del Fuego in the 1880s. Then people from Argentina and Chile started moving to the islands. Oil was found in the area in 1945.

► More to explore

Argentina • Chile • Magellan, Ferdinand

Tiger

The tiger is the largest of the cats. Like lions, tigers are very strong and fierce hunters. Tigers are found in the wild only in parts of Russia, China, and South and Southeast Asia. They live in forests, grasslands, and swamps. The scientific name of the tiger is *Panthera tigris*.

Physical Features

Male tigers can grow to more than 3 feet (1 meter) high and 10 feet (3 meters) long, including the tail. They usually weigh between 350 and 640 pounds (160 to 290 kilograms). Their fur can range from light yellow on the belly to deep yellow or orange on the back. Dark stripes cover the head, body, and legs. There are also black rings on the tail.

There are five different kinds of tiger. The best known is the Bengal tiger, found mainly in India. The rare Siberian tiger is larger and has longer, softer fur. The Bengal and Siberian tigers are the kinds most often seen in zoos.

Behavior

Tigers hunt alone at night. They prey on animals such as deer and wild hogs. Tigers generally avoid large animals such as elephants and bears. They also try to stay away from people. But sometimes they attack people to save themselves or because they cannot find other food.

A tiger crouches in the grass and watches its prey before attacking it. It grabs the prey with its paws and bites the animal's neck. Then the tiger drags the dead animal to a safe place and eats it over several days.



Siberian tiger

Life Cycle

Tigers normally come together only to mate. About three months after mating, the female has two or three cubs. She looks after them for about two years and teaches them to hunt. Tigers live about 11 years.

Tigers and Humans

Tigers are endangered, or in danger of dying out. People have moved onto land where tigers once lived, destroying their homes. Plus, people hunt tigers for sport and for their skin. Many countries now have laws to protect tigers.

► More to explore

Cat • Lion

Tigris River

The Tigris River of southwest Asia is 1,180 miles (1,900 kilometers) long. It begins in the mountains of eastern Turkey. It then touches the northeastern border of Syria and crosses Iraq. In southeastern Iraq the Tigris joins the Euphrates River. The two rivers together

form the Shatt Al-'Arab. That waterway empties into the Persian Gulf.

The land that the Tigris flows through gets little rainfall. It is also very hot. But farmers are still able to grow crops there. They water their crops using water from the Tigris and the Euphrates. The watering methods they use are called irrigation.

Some of the earliest known civilizations began on the land between the Tigris and the Euphrates. The ancient Greeks called the area Mesopotamia. The name means “land between the rivers.” Several ancient cities were built along the Tigris. One was Assur. That city gave its name to the empire called Assyria. Nineveh was another ancient city on the river. It was Assyria’s capital. The main modern cities on the Tigris are Baghdad and Mosul, both in Iraq.

► More to explore

Euphrates River • Irrigation
• Mesopotamia



Tile

► see Brick and Tile.

Time

People use the idea of time to measure how long it takes for things to happen. They also use time to describe how long ago things happened in the past. Time helps to describe when things may happen in the future as well.

Units of Time

People divide time into days and hours. There are 24 hours in one full day and night. Hours are divided into minutes and seconds. There are 60 minutes in an hour and 60 seconds in a minute.

People measure longer periods of time by years. There are 365 or 366 days in one year. A year is divided into 12 months. Months have from 28 to 31 days.

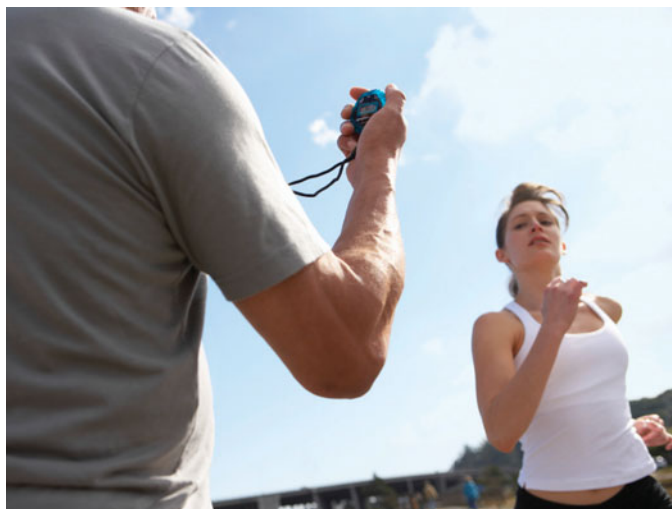
Time Zones

At any time, only part of Earth experiences daylight. It is nighttime for the rest of the planet. This means that it cannot be the same time of day in every part of the world. For this reason people have divided the globe into 24 sections called time zones. At most places inside a time zone, it is the same time of day.

Imaginary lines separate all the time zones. The lines run from the North Pole to the South Pole. The first time zone begins at 0° longitude, or the prime meridian. This imaginary line runs through Greenwich, England.

When people cross one of the imaginary lines, they enter a new time zone. The time of day changes by one hour. If they cross into a time zone to the west, it is one hour earlier. If they cross into a time zone to the east, it is one hour later. (In a few places in the world, the time changes by only a half hour.)

The imaginary lines dividing the time zones are not always straight. They often bend west or east. This allows whole countries or regions to be within a single



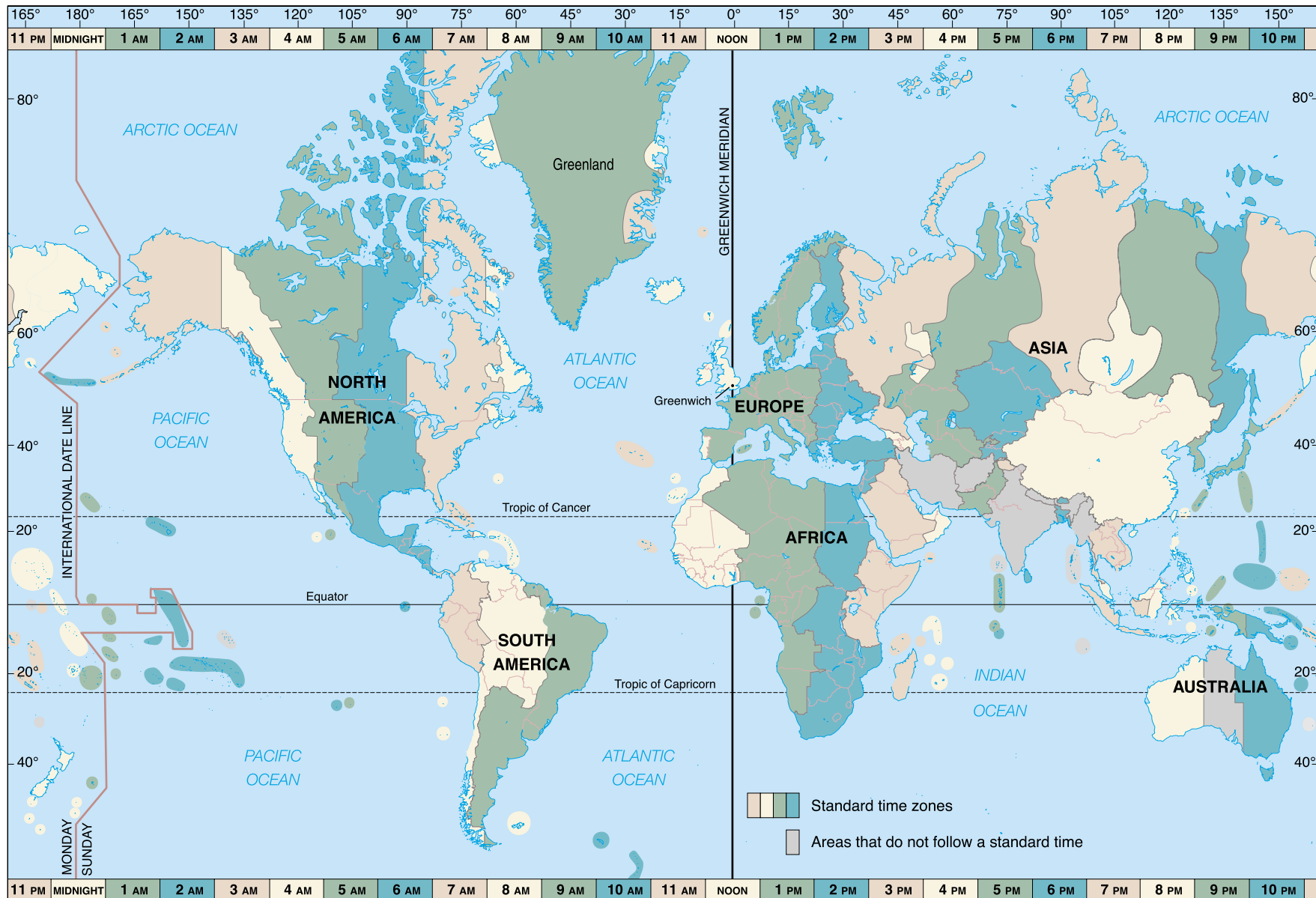
A stopwatch measures the minutes and seconds an athlete takes to complete a run. People use many different types of watches, clocks, and calendars to keep track of time.

time zone. However, large countries—such as the United States and Russia—are divided into several time zones.

On the other side of Earth from the prime meridian is the International Date Line (IDL). It runs through the Pacific Ocean at about 180° longitude. When travelers cross the IDL going from west to east, they gain a whole day on the calendar. For example, if they start traveling on January 2, the date changes to January 1 when they cross the IDL. When people travel from east to west across the IDL, they move a day forward in time.

History

Ancient people measured time by looking at the sky. They saw the sun rise and set and the Moon grow full. They watched the stars and the other planets change position. They also experienced the days becoming shorter and longer and the cycle of the seasons.



Earth is divided into 24 time zones. The boundary lines between the zones are not always straight because every country makes its own rules about which time zones it wants to be in.

People in ancient Egypt, Mesopotamia, Central America, and other places created calendars to keep track of the passing days. The ancient Egyptians also invented a form of clock called a sundial. Sundials cast shadows that move as the day passes.

Eventually people all over the world had developed many types of clocks and calendars to keep track of time. But the time was different in every city. In the 1800s some people thought there should be one system of measuring time so that everyone could agree about what time it is. This was important for such things as making schedules for trains and knowing when to go to school. In 1884 countries throughout the world adopted the time zone system that is still in use.

► More to explore

Calendar • Clock • Latitude and Longitude • Season • Sundial

Tiranë



Population
(2001 census)
343,078

Tiranë is the capital of Albania, a country in southeastern Europe. It lies on the Ishm River. It is Albania's largest city.



People crowd Tiranë's main square at night.

Tiranë is Albania's main center of business and industry. However, in the early 21st century the country's economy was one of the poorest in Europe. Factories in Tiranë make clothing, processed foods, leather, and other products.

A Turkish general founded Tiranë in the early 1600s. Albania was then part of the Turkish Ottoman Empire. Tiranë gradually grew into a busy trading center.

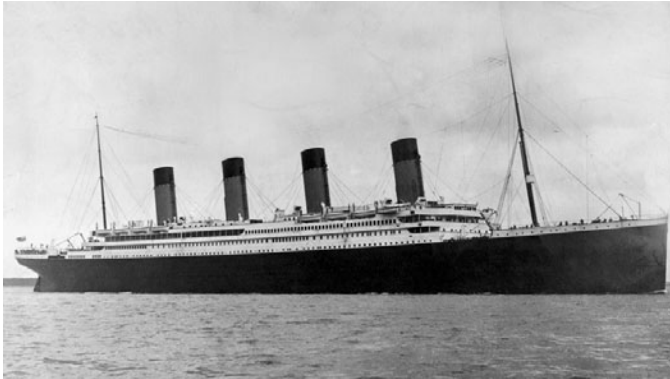
Albania became an independent country in 1912. Tiranë became its capital in 1920. Between 1939 and 1944, during World War II, Italian and then German forces controlled the city.

Between 1946 and the early 1990s, Albania was a Communist country. Protests in Tiranë helped to bring an end to Communist rule. However, the end of Communism did not bring about a lasting peace. In the later 1990s the city was the site of several violent political protests.

► More to explore

Albania

Titanic



The passenger ship called the *Titanic* sank in 1912, on its first voyage.

On its first trip across the Atlantic Ocean, a passenger ship called the *Titanic* struck a huge iceberg. The ship sank on April 15, 1912, killing more than 1,500 people. It was one of the most famous disasters of the 20th century.

Before there were airplanes, people crossed oceans on ships called ocean liners. The *Titanic* was one of the largest ocean liners of its time. It was more than 880 feet (270 meters) long and had nine decks, or floors. The hull, or body, was made of steel and divided into 16 compartments. Some people said that the *Titanic* was unsinkable.

On April 10, 1912, the *Titanic* set out from Southampton, England. It was bound for New York City. Some of the passengers were rich people on business or pleasure trips. Others were poor European emigrants who were looking for a better life in North America.

Lookouts saw an iceberg at 11:40 PM on April 14. The ship could not move out

of the way fast enough. The hull was torn apart and the ship began to fill with water. At 2:20 AM the next day, the *Titanic* sank.

About 705 people escaped in lifeboats. However, there were not nearly enough lifeboats for the 2,224 people that the ship carried. Governments strengthened safety rules for ships after the disaster.

In 1985 deep-sea explorers found the remains of the *Titanic* at a depth of 13,000 feet (4,000 meters) near the Canadian island of Newfoundland. Underwater vessels explored the ship and brought pieces of wreckage to the surface.

► More to explore

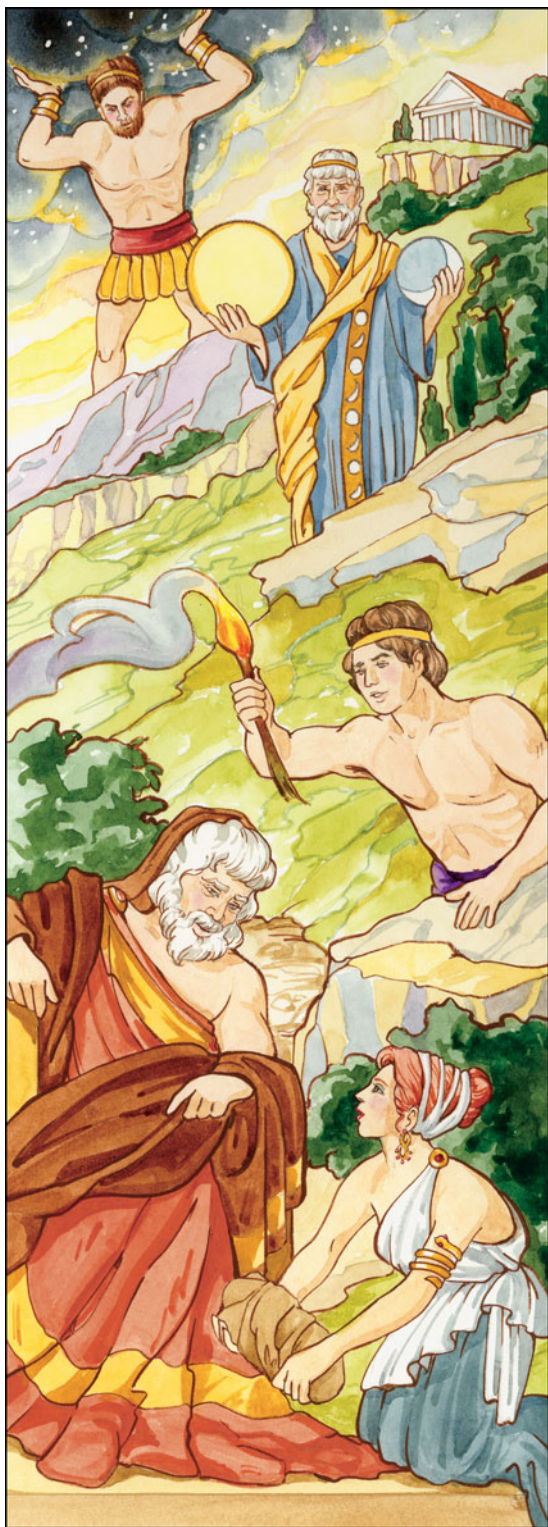
Iceberg • Ship

Titans

In ancient Greek mythology the Titans were giants who once ruled the world. According to legend, they were the children of Uranus (Heaven) and Gaea (Earth). Uranus hated his children, and he shut them up in the Earth. The Titans rebelled against him and took power. Cronus (Saturn) then became the ruler of the Titans.

Later Cronus' son Zeus led a long war that forced the Titans from power. Zeus then became the chief god.

Other important Titans included Rhea, who was the wife of Cronus and the mother of Zeus. The Titan called Hyperion was the father of the sun, Moon,



The Titans were a group of giants in the myths of ancient Greece. Among the more important Titans were Atlas, Hyperion, Prometheus, Cronus, and Rhea.

and dawn. Atlas was a Titan who had to carry the heavens on his shoulders. And

the Titan Prometheus helped human-kind by giving people fire.

► More to explore

Atlas • Greece, Ancient • Mythology
• Prometheus • Zeus

Tlingit

The Tlingit are Native Americans of southern Alaska and northern British Columbia, in Canada. They live along the coast and on nearby islands in the Pacific Ocean.

The Tlingit traditionally got much of their food by fishing. They also hunted seals and sea otters and gathered wild berries and roots. The Tlingit used cedar wood from nearby forests to build houses. Their houses were large enough for several families.

In 1741 Russian explorers arrived in Tlingit lands. By the end of the 1700s Russian traders had set up a fort in Tlingit territory. Many Tlingit fell ill with deadly diseases carried by the Russians and other European settlers. In the 1830s smallpox killed about half of the Tlingit.

In 1867 Russia sold Alaska to the United States. Then U.S. settlers began taking over the tribe's land. More settlers arrived after gold was discovered in the area in 1880.

In 1912 the Tlingit helped to form a group called the Alaska Native Brotherhood. This group worked to take back the lands of southern Alaska's Indians.



Tlingit gather in Sitka, Alaska, in 2004 to remember a battle with Russian soldiers that took place in 1804.

In 1971 the U.S. government returned 44 million acres (18 million hectares) of land to the Tlingit and other tribes.

At the end of the 20th century more than 9,000 Tlingit lived in the United States. Another 1,000 Tlingit lived in Canada.

► More to explore

Native Americans

Toad

Toads are small animals often confused with frogs. Toads, however, have dry, rough skin and short legs. Frogs have moist, smooth skin and longer legs.

Toads can be found in all but the coldest parts of the world. They are amphibians, meaning that they live on both land and water. However, toads generally spend more of their time on land than they do in the water.

Toads have squat, plump bodies. They do not have tails. They range from about 1 to 10 inches (2.5 to 25 centimeters) long. Their skin is usually brownish olive, often with some darker spots. One group, called variegated toads, has large back feet and are bright yellow, red, or green with black spots.

Toads are typically covered with bumps that look like warts. When a toad feels threatened it releases poison from the bumps. The poison can sting an enemy's eyes and mouth. The poison of some toads is strong enough to kill their enemies.

Toads are active mainly at night. They spend the day underground or hidden under leaves or stones. In the winter most toads enter a state of inactivity called hibernation. Some toads are inactive during hot and dry weather as well.

Toads move by short hops or by walking. They catch prey with their long, sticky tongues. Toads generally eat insects and worms. Some large toads, however, eat frogs and small rodents.



The natterjack toad lives in northern Europe.



Some toads, such as the Oriental fire-bellied toad, can be quite colorful.

Toads lay their eggs underwater. After a few days the eggs hatch into small, fish-like creatures called tadpoles. Tadpoles have tails and gills. The gills are structures that help them breathe underwater. Tadpoles eventually lose their tails and develop lungs and legs. They can then leave the water to live on land.

► More to explore

Amphibian • Frog • Hibernation

Tobacco

Tobacco is a plant that is grown for its leaves. The dried leaves are usually made into cigarettes, cigars, or pipe tobacco. Users light these products and breathe in the smoke. Tobacco also may be chewed or taken in the form of a powder.

All these products deliver a habit-forming drug called nicotine to the user. This drug makes it hard to stop using tobacco. But using tobacco can cause serious health problems, including lung cancer, breathing disorders, and heart disease.

Native Americans were the first people to grow tobacco plants. They used tobacco in ceremonies and as medicine. In the late 1400s and early 1500s European explorers learned about tobacco from the Native Americans. The Europeans established large farms called plantations in the Americas to grow the crop. They also brought tobacco back to their home countries.

Today people in many parts of the world grow and use tobacco. However, some governments have tried to limit its use. For example, some places do not allow smoking in public buildings.



Tobacco plants produce large leaves. The leaves are dried after they are picked.

► More to explore

Drug

Tobago

► see Trinidad and Tobago.



Togo

The tiny country of Togo sits north of the equator in West Africa. Togo's capital is Lomé.

Togo is a long, narrow country. In the south it has a short coastline on the Atlantic Ocean. Togo borders Ghana, Burkina Faso, and Benin. The Togo Mountains cross central Togo. Plains cover the north. Togo has a hot climate with dry and rainy seasons.

Grasslands and scattered trees cover most of Togo. Tropical forests grow in the southwest. Togo's animals include elephants, lions, monkeys, hippopotamuses, crocodiles, lizards, and snakes.



Women shop at an outdoor market in Togo.

Facts About TOGO



Population
(2008 estimate)
6,762,000

Area
21,925 sq mi
(56,785 sq km)

Capital
Lomé

Form of government
Republic

Major cities
Lomé, Sokodé,
Kpalimé, Atakpamé, Kara

Togo has many different ethnic groups. The two largest groups are the Ewe in the south and the Kabre in the north. Most of the people practice Christianity, African religions, or Islam. French is the national language. Most people live in small villages.



Most of Togo's people are farmers. The main food crops include cassava, yams, and corn. Many people raise sheep, goats, and pigs. Farmers also produce coffee, cocoa, and cotton. Fishing is another source of food.

The Ewe and the Kabre peoples lived in the region before the 1300s. In 1884 Germans took over the region. During World War I France gained control of part of the area.

In 1960 French Togoland gained independence. In 1967 a military general took power. He remained president until he died in 2005. Togo then elected his son as president.

► More to explore

Lomé

Tohono O'odham

The Tohono O'odham are Native Americans who live in southern Arizona and northern Mexico. They are often called the Papago. The Tohono O'odham are related to the Pima people. They may be descendants of the ancient Hohokam Indians.

The Tohono O'odham traditionally built houses from mud and brush in the desert. Their name means “desert people.” Because their land was very dry, they moved in different seasons to make sure they had enough water. Summer rains provided water to grow crops. The tribe grew corn, beans, squash, and cotton. When the rains stopped, the



A photograph from the early 1900s shows a Tohono O'odham woman carrying a basket on her head.

Tohono O'odham moved to winter villages in the mountains. There they got water from springs. For food, they hunted wild animals and gathered wild plants.

Spanish explorers arrived in the lands of the Tohono O'odham in the late 1600s. The Spanish taught the tribe how to grow wheat and raise cattle and horses.

The Tohono O'odham of Mexico eventually lost much of their land to settlers and ranchers. The Tohono O'odham of the United States were given several reservations. The Tohono O'odham Reservation in Arizona is the country's second largest reservation. In the late 20th century there were more than 17,000 Tohono O'odham in the United States. A few hundred lived in the Mexican state of Sonora.

► More to explore

Hohokam Culture • Native Americans
• Pima

Tokyo



Population

(2008 estimate), city, 8,731,000;
(2007 estimate), urban area, 35,700,000

Tokyo is the capital of Japan, an island country in eastern Asia. It is located on Japan's main island, Honshu. The city



Shibuya is a lively shopping district in Tokyo.

lies on Tokyo Bay, which is part of the Pacific Ocean. Tokyo is one of the largest cities in the world. It is Japan's center of industry, culture, and education.

The city of Tokyo is part of the huge Tokyo metropolitan area. It includes the countryside around Tokyo as well as several islands. The Tokyo metropolitan area also includes three other major cities—Yokohama, Kawasaki, and Chiba.

Cityscape

Tokyo has several distinct districts. At the heart of the city is the Imperial Palace, the home of the emperor of Japan. Many other national government buildings are in the nearby Kasumigaseki district. Marunouchi is a business district. Shinjuku is a center of entertainment and shopping. The Ginza district is world famous for its expensive stores.

Economy

Tokyo is Japan's main center of manufacturing, banking, and business man-

agement. Many companies have headquarters in the city. Publishing is a leading industry. Factories in Tokyo make such products as computers, televisions, and other electronics. Factories in the metropolitan area produce metals, chemicals, and machinery.

History

In ancient times the city was named Edo. It was a small village until the Tokugawa family began ruling Japan in the early 1600s. The Tokugawa rulers made Edo their headquarters. The city then grew greatly. In the 1800s more than a million people lived there. However, Japan's official capital was the city of Kyoto.

The emperor Meiji began ruling Japan in 1868. Edo was then renamed Tokyo and made the official capital. Under Meiji's rule the city was made more modern.

An earthquake severely damaged Tokyo in 1923 and killed at least 100,000 people. Bombing destroyed much of the city in the 1940s, during World War II. But Tokyo was soon rebuilt. In the second half of the 1900s it developed into an industrial center. It also became known for its many modern skyscrapers.

► More to explore

Japan

Tolkien, J.R.R.

J.R.R. Tolkien wrote popular books of fantasy fiction. The most famous of his



J.R.R. Tolkien

books are *The Hobbit* and *The Lord of the Rings*.

John Ronald Reuel Tolkien was born on January 3, 1892, in South Africa. At age 4 he moved with his family to Great Britain. Tolkien graduated from Oxford University in 1915. Soon afterward he left to fight for the British in World War I.

In 1925 Tolkien began teaching at Oxford. His classes dealt with the roots of the English language. He studied old fables, myths, and legends. During this time Tolkien began writing fantasy stories. Part of this writing included making up an entire language called Elvish. The characters called elves in Tolkien's stories speak this language.

Tolkien published *The Hobbit* in 1937. He wrote it partly to amuse his four children. The main character of the book is a short, furry-footed creature called a hobbit. The story takes place in a fantasy world called Middle-earth.

The Lord of the Rings, published in 1954 and 1955, also takes place in Middle-earth. This novel is sometimes divided into three parts: *The Fellowship of the Ring*, *The Two Towers*, and *The Return of the King*.

Tolkien died on September 2, 1973. He had started another book about Middle-earth, called *The Silmarillion*, but did not finish it. Tolkien's son Christopher published this book in 1977.

Toltec

The ancient Toltec people developed a great civilization in what is now central Mexico. From the AD 900s to the 1100s they were the most powerful Native Americans in the region.

The capital city of the Toltec was Tula. Historians do not know exactly where Tula was. However, they know that it



Stone columns that stand 15 feet (4.6 meters) high were carved by the Toltec in Mexico.

was in the area of what is now Mexico City. As many as 40,000 people lived in Tula.

The Toltec built houses out of clay bricks. These bricks kept the heat out in the summer and the cold out in winter. In Tula the Toltec also built great pyramids and palaces.

The Toltec farmed for most of their food. They grew corn and squash. They also grew cotton and plants that they used to make medicines.

Did You Know?

The Toltec are known for the art objects they made from stone and metal.

The Toltec settled in what is now central Mexico in about AD 900. In the 1100s other Indian groups began invading Toltec lands from the north. The invaders were called the Chichimec. The Chichimec destroyed Tula in about 1160.

The Chichimec took on many Toltec ways of life. Among the Chichimec groups were the Aztec. They created the next great Indian civilization in central Mexico.

► More to explore

Aztec • Native Americans

Tomato

Tomatoes are commonly called vegetables, but they are actually fruits. They are eaten raw or used in cooking.

Canned tomatoes and tomato juice are also popular. Tomatoes are grown in all mild regions of the world. They belong to the nightshade family.



Tomatoes come in different sizes and shapes. Some small varieties are called cherry tomatoes or grape tomatoes.

Tomato plants generally have many spreading branches. The leaves are hairy and have a strong smell. The flowers are yellow and hang in clusters. The fruit is about 0.5 to 3 inches (1.3 to 7.6 centimeters) across. It can be round or oval or shaped like a pear. When ripe, the fruit is soft, juicy, and usually red or yellow. Tomatoes contain many small seeds surrounded by jellylike pulp. This pulp contains most of the tomato's vitamin C.

Tomato plants first grew wild in the Andes Mountains of South America. The Spanish brought tomatoes to Europe after finding them growing in the Americas. At first Europeans grew tomatoes only for decoration. They thought that tomatoes were poisonous because they are related to the deadly nightshade plants. Tomatoes did not become popular in the United States until the early 1900s.

► More to explore

Fruit • Nightshade

Tonga



Schoolchildren in Tonga raise their hands to answer the teacher's question.

The country of Tonga is made up of about 170 islands in the southern Pacific Ocean. The largest island is Tongatapu. It is where the capital, Nuku'alofa, is located.

Tonga is a part of the Pacific region called Oceania. People live on only about 40 of Tonga's islands. Some islands are the peaks of underwater volcanoes. Others are atolls, or coral reefs that surround a pool of water. Tonga's climate is warm and rainy.



Rain forests grow on the volcanic islands. Mangrove trees grow in swampy areas. Tonga's birds include doves, kingfishers, cuckoos, and shrikes. Large fruit bats, called flying foxes, live on Tongatapu.

Almost all the people of Tonga are Polynesians, the native people of eastern Oceania. The main languages are Tongan and English. Nearly all Tongans are Christians. About two thirds of the people live on Tongatapu. Fewer than half of the people live in cities.

The economy of Tonga is based on farming and fishing. Farmers grow squash, coconuts, cassava, yams, bananas, and vanilla beans. They also raise pigs, goats, and cattle. Tourism is another important part of the economy.

People have lived on the islands for at least 3,000 years. Kings and queens have ruled Tonga since the AD 900s.

Dutch and British explorers visited the islands in the 1600s and 1700s. Christian missionaries arrived in the 1800s. In 1900 Tonga gave control of its foreign affairs to Great Britain.

Tonga became independent of Britain in 1970. In the 1990s some Tongans began asking the king to make the country a democracy.

► More to explore

Nuku'alofa • Oceania

Facts About TONGA



Population
(2008 estimate)
103,000

Area
290 sq mi (750 sq km)

Capital
Nuku'alofa

Form of government
Constitutional monarchy

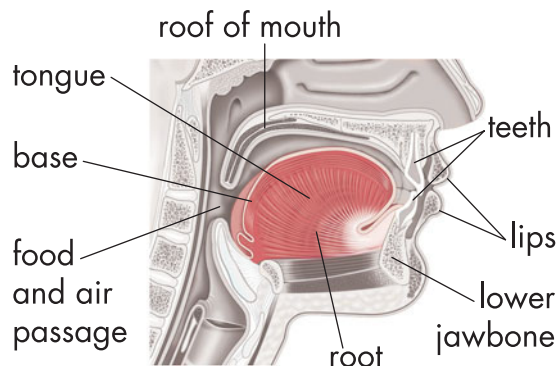
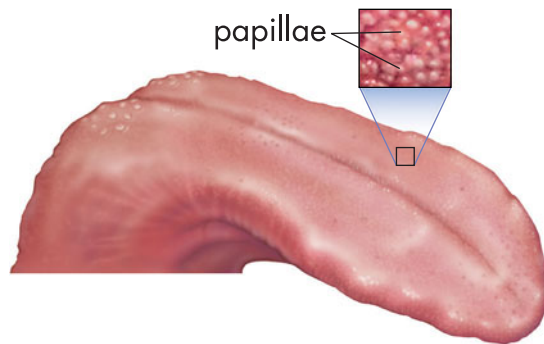
Major towns
Nuku'alofa,
Neiafu,
Haveluloto

Tongue

The tongue is an organ, or body part, in the mouth. It is made up of a group of muscles. Most vertebrates, or animals with a backbone, have a tongue.

The tongue is firmly attached to the bottom of the mouth. This attachment keeps the tongue from being swallowed. The underside of a mammal's tongue is smooth. The top of the tongue is rough and bumpy. These bumps are called papillae. The papillae contain taste buds. They also produce some of the fluid in saliva, a sticky liquid that keeps the mouth moist.

The Human Tongue



The drawing on the top shows papillae on the tongue. The drawing on the bottom shows how the tongue fits into the mouth.

Eating and Tasting

In many animals the tongue helps in chewing and swallowing food. Papillae help to grip and hold food. The front muscles of the tongue move food around and over the teeth during chewing. The back muscles of the tongue help in swallowing. They push chewed food to the back of the mouth and down the throat.

The tongue is also responsible for the sense of taste. The taste buds contain special cells that send information about foods to the brain. These special cells each respond to a particular kind of taste. Humans can sense five basic tastes: salty, sweet, sour (acid), bitter, and umami. Umami represents the taste of certain chemicals called amino acids.

People are born with about 10,000 taste buds, and there may be 50 to 150 cells in each bud. As people age, the number of taste buds may drop to 5,000. This may explain why some foods taste stronger to young people.

Other Uses

Tongues have many other uses. The human tongue plays an important part in speaking. It forms and shapes the sounds that make up language. Dogs and cats use their tongues to clean themselves. Frogs use their tongues to catch insects and other small animals for food. Snakes and other reptiles flick out their tongues to collect scents in the air.

► More to explore

Mouth • Muscle

Tonsillitis

Tonsillitis is an infection of the tonsils. The tonsils are oval-shaped lumps of tissue in the throat. Usually they help protect the body against disease. But sometimes they become infected themselves. An infection is an attack by tiny germs that cause disease. Children get tonsillitis more often than adults.

The germs that cause tonsillitis are called bacteria and viruses. Infected tonsils become large and red. A person with tonsillitis first feels a sore throat. The sore throat sometimes makes it painful to talk or to swallow. The person might also get a fever. Glands on the sides of the neck might swell.

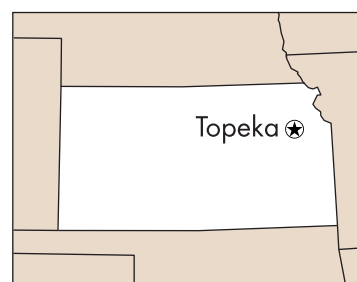
Tonsillitis spreads easily, especially by coughs and sneezes. Avoiding people with tonsillitis reduces the chance of infection. Frequent hand washing also helps. Washing the hands can kill the bacteria and viruses that cause tonsillitis.

The treatment of tonsillitis depends on the cause. If bacteria are the cause, the doctor gives the person a medicine called an antibiotic. If a virus is the cause, the tonsillitis usually has to clear up on its own. Tonsillitis generally lasts less than a week. During that time the person should rest and drink lots of liquids. In some severe cases of tonsillitis, a doctor has to remove the tonsils.

► More to explore

Bacteria • Virus

Topeka



Population
(2000 census)
122,377;
(2007 estimate)
122,642

Topeka is the capital of the U.S. state of Kansas. The city lies on the Kansas River.

Many people in Topeka work for the government or in trade, health care, or other service industries. The city is an important market for wheat grown in the surrounding area. The leading manufacturing industries include printing, food processing, and making tires.

In its early history Topeka played a role in the U.S. conflict over slavery. A group of people who opposed slavery founded the city in 1854. Several battles took place there. Groups fought over whether



A doctor examines a girl's throat. When a child has a sore throat, the doctor often checks for tonsillitis.



A sculpture honoring pioneers stands near the Kansas state Capitol in Topeka, Kansas.

Kansas should permit slavery when it became a U.S. state. In 1861 Kansas became a state that did not allow slavery. Topeka was made the capital.

In the 1860s Topeka became the headquarters for the building of a large railway. The railway brought jobs to the city and helped it grow.

In 1951 the Kansas River overflowed and flooded Topeka. A tornado damaged much of the city in 1966.

► More to explore

Kansas • Slavery

Torah

A holy text of Judaism, the Torah is made up of the first five books of the Hebrew Bible (which Christians call the Old Testament). These books are Genesis, Exodus, Leviticus, Numbers, and Deuteronomy.

The Torah begins with the story of the creation of the world. It goes on to

explain and interpret the laws of God, including the Ten Commandments. Jews believe that God gave the laws of the five books to the prophet Moses on Mount Sinai.

All Jewish synagogues, or places of worship, keep a copy of the Torah. The copy is written by hand on parchment scrolls (rolled-up sheets of animal skin). During most synagogue services a member of the congregation reads from the Torah. Most synagogues read the entire Torah in one year.

In Hebrew the word Torah means “to teach” or “to show the way.” In that broad sense, all Jewish teachings—including the Hebrew Bible, the Talmud, and unwritten Jewish traditions—can be considered part of the Torah.

► More to explore

Bible • Judaism • Moses • Talmud



The Torah is a Jewish holy text. Each copy is handwritten on rolled-up sheets of animal skin.

Toussaint-Louverture



Toussaint-Louverture

Toussaint-Louverture was born a slave but became a great military leader. He led the fight for the independence of Haiti. Haiti occupies part of the island of Hispaniola in the West Indies.

Early Life

François Dominique Toussaint was born in about 1743 in Saint-Domingue (now Haiti). He was black, like most of the other slaves in Saint-Domingue. Although he was a slave, he learned some French and Latin. As a young man he supervised the work of other slaves on the large farm where he lived. He became free in 1777.

Rebel Leader

During most of Toussaint's life, France controlled Saint-Domingue. But the slaves greatly outnumbered the French people living there. In 1791 the slaves

rose up in rebellion. Toussaint formed his own rebel army. He soon became known as Toussaint-Louverture. This was because he easily found openings in the enemy's defenses. ("Louverture" comes from the French word for "opening.")

France fought to end the rebellion. But by 1801 Toussaint had taken over all of Hispaniola. He freed everyone on the island who was still a slave. He then made himself governor-general for life.

Capture and Death

Toussaint ruled until 1802. In that year France sent troops to take back control. Toussaint's forces were outnumbered. In 1803 the French captured Toussaint and sent him to France. He died in a French prison on April 7, 1803.

Another black leader named Jean-Jacques Dessalines continued the fight against France. His forces won independence for Saint-Domingue—renamed Haiti—in 1804.

► More to explore

Haiti • Slavery

Toy

Children everywhere enjoy playing with toys. A toy can be a simple ball, a game, or an expensive machine that uses the latest technology. Years ago most toys were made from wood and cloth. Today the most common material is plastic.

Toys date back to ancient times. Scientists often find toys when they dig up old ruins. These include ancient balls,

Did You Know?

Teddy bears have been popular toys for more than 100 years. They are named after Theodore "Teddy" Roosevelt, who was U.S. president from 1901 to 1909.



Simple wooden blocks decorated with numbers and letters are a popular toy.

dolls, tops, and toy wagons and boats. They have also dug up game pieces. People have played games similar to chess, checkers, and backgammon for thousands of years.

Many toys, from both ancient and modern times, look like objects from the adult world. As children grow they often imitate adults in their play. They enjoy toys modeled after things that adults use in everyday life. A child in ancient Egypt might have played with a small wooden camel. A child in today's world might have a toy car or a toy telephone.

The modern toy industry is a very big business. Simple toys are still common. But many companies produce toys that run on batteries. Other toys use the latest electronic and computer technology.

The toy business is challenging, however, because fads quickly come and go. A toy loved by children today may soon lose popularity. Safety is another concern for toy makers. Most toy packaging

includes safety warnings. These messages warn about such things as small objects that a very young child could swallow.

► More to explore

Electronic Games

Track and Field

Contests of running, jumping, and throwing are called track-and-field events in the United States. In other countries this group of sporting events is called athletics. Track and field is the oldest form of organized sport. It is a major part of the Summer Olympic Games.

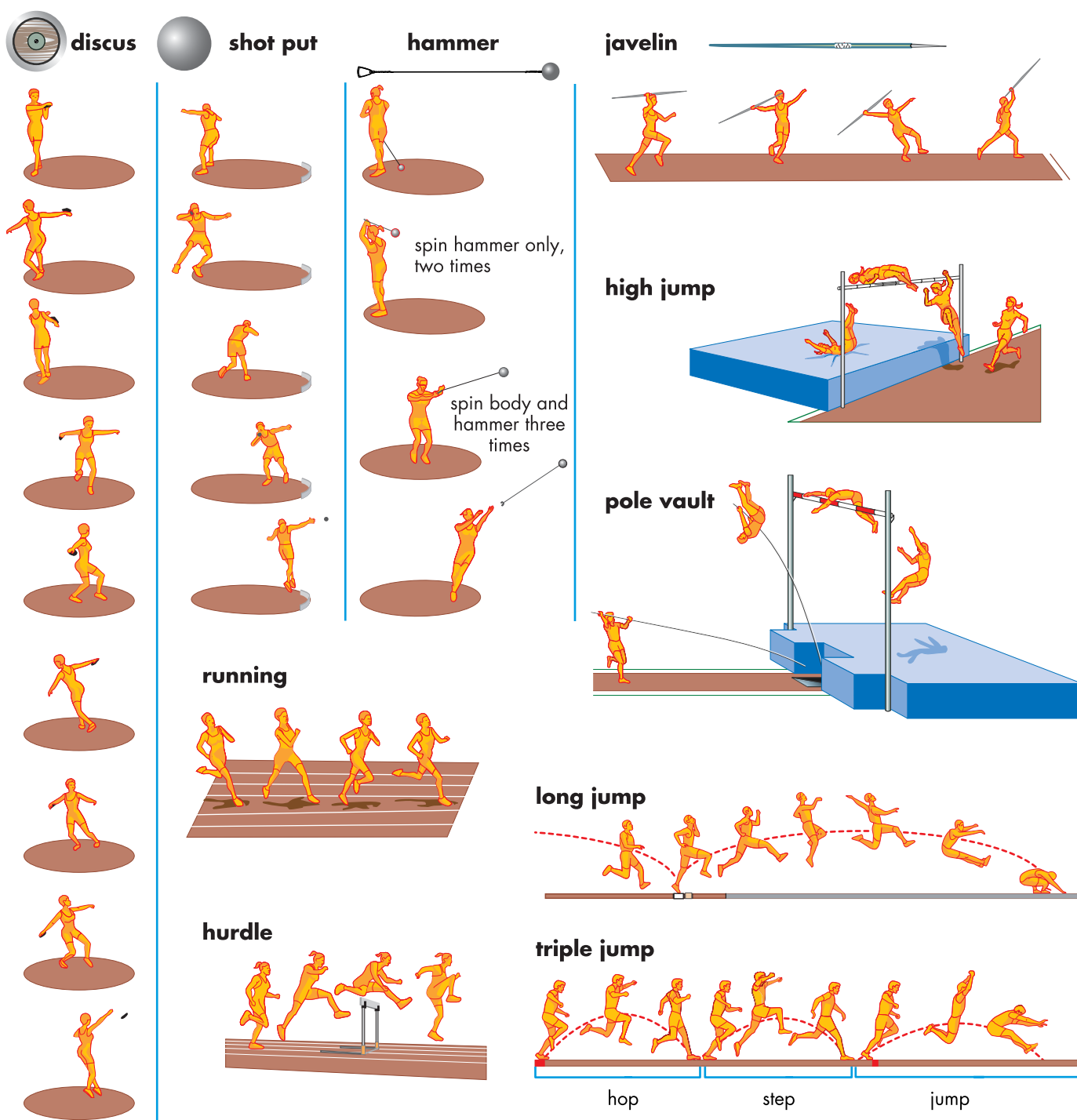
Track Meets and Events

Track-and-field events take place during a competition called a meet, or track meet. Track meets can be held either indoors or outdoors. Most meets take place in outdoor stadiums. These stadiums have a grass infield surrounded by an oval running track.

The contests in a meet are divided into track events and field events. In the track events athletes race against each other. The track used for outdoor running events measures 400 meters around. (One meter is equal to 3.3 feet.) The track is divided into running lanes. All the other events in a meet—the jumps and the throws—are field events. Field events are normally held in the grass infield.

Running Events

Short-distance races are called sprints. They cover distances of 100 meters, 200



Athletes compete in a variety of throwing, jumping, and running events at a track meet.

meters, and 400 meters. Sprinters need to get a quick start. Then they run at top speed for the whole race.

Middle-distance races cover 800 to 2,000 meters. Like sprinters, middle-

distance runners need speed. But unlike sprinters, they do not always run at top speed. They need to adjust their speed to make sure that they have enough strength to run a longer distance. This strategy is called pacing.

Long-distance races cover 3,000 meters or more. Speed is not as important in long-distance races as it is in shorter races. Above all, long-distance runners need good physical conditioning. They have to be able to run for a long time. The marathon is a long-distance race that covers 26 miles 385 yards (42.2 kilometers). Marathons are run on roads. Cross-country races are long-distance events run on natural land.

There are several other types of running events. Relay races involve four runners per team. Each team member runs one fourth of the race's total distance. Hurdling combines sprinting with jumping over barriers called hurdles. The steeplechase is a long-distance race in which runners jump over hurdles and water barriers.

Jumping Events

There are four jumping events at a track meet: the high jump, the pole vault, the long jump, and the triple jump. The high jump and the pole vault are called vertical jumps. The athlete who jumps



In the type of race called hurdling, runners jump over a series of barriers called hurdles.



Pole vaulters use a long, flexible pole to launch themselves over a high bar.

the highest is the winner. High jumpers try to leap over a thin bar balanced between two supports. Pole vaulters also try to jump over a bar, but the bar is set higher. They use a long, flexible pole to gain height. The pole bends to launch the vaulter over the bar.

The long jump and the triple jump are called horizontal jumps. The athlete who jumps the farthest wins these events. In both events the athlete begins with a high-speed run. At the end of the run a long jumper takes a single leap forward. A triple jumper must perform a series of three actions: a hop, a step, and a jump.

Throwing Events

A track meet includes four throwing events: the shot put, the hammer throw, the discus throw, and the javelin throw. In each event athletes try to throw an

object as far as possible. The shot is a heavy metal ball. The hammer is a metal ball connected by a strong wire to a handle. The discus is a plate-shaped disk. The javelin is a spear. The athlete who throws the object the farthest wins.

Decathlon and Heptathlon

The decathlon and the heptathlon are competitions that combine several events. They test all-around athletes. In the Olympics men compete in the decathlon and women compete in the heptathlon. Points are awarded in each event and added up to determine the winner.

The decathlon and the heptathlon each take two days to complete. The decathlon consists of 10 events: the 100-, 400-, and 1,500-meter runs, the 110-meter hurdles, the discus and javelin throws, the shot put, the pole vault, the long jump, and the high jump. The heptathlon consists of seven events: the 200- and 800-meter runs, the 100-meter hurdles, the high jump, the long jump, the shot put, and the javelin throw.

History

People in different cultures have held footraces and other track-and-field contests for thousands of years. The first records of the Olympic Games, held in Greece, date from 776 BC. At those Olympics there was only one event, a footrace. Later Olympics in Greece included a five-event competition. It consisted of a footrace, the long jump, wrestling, and javelin and discus throws. The ancient Olympics ended in the AD 300s.

Track and field as practiced today developed in England. There the sport dates back to the 1100s. But track and field was not well organized as a sport until the 1800s. The sport started becoming popular in the United States in the 1860s.

The Olympic Games began again in 1896. The Olympics helped to spread interest in track and field throughout the world. An organization called the International Association of Athletics Federations (IAAF) now governs track-and-field competition in the Olympics. It also approves all world records in track-and-field events.

► More to explore

Marathon • Olympic Games

Trade

Trade is the buying and selling of goods and services. Goods are objects that people grow or make—for example, food, clothes, and computers. Services



Machines move large containers of goods off a ship and onto trucks at a port in Canada. Shipping goods between countries is an important part of international trade.

are things that people do—for example, banking, communications, and health care. People have traded since prehistoric times. Today most countries take part in international trade, or trade across country borders.

Reasons for Trade



Many children enjoy trading baseball cards. A trade only happens when each person has a card or cards that the other person wants.

Trade happens because people need or want goods that they do not have. People also trade for services when they do not have the time or the skills to do things. Trade between countries happens for similar reasons. For example, some countries have resources, such as oil, or skills, such as car manufacturing, that other countries will buy.

Both people and countries want trade to benefit them. Families want to earn more money than they spend on goods

and services. Countries try to sell, or export, as much as they buy, or import, from other countries.

Trade Limits

In some economies, the government controls all trade. In others, the government allows companies to trade more freely. However, even governments that support free trade control trade in some way. They may keep companies from trading dangerous or illegal products. They may also pass laws to prevent companies from forming monopolies. A monopoly occurs when one company has so much control over a certain type of good or service that no other companies can compete, or make money selling that good or service.

Countries also limit trade between other countries and themselves to protect their economies. Countries may charge tariffs, or special taxes, on foreign goods. They may also set quotas, or limits on the amount of foreign goods they buy.

Free Trade

In the 1900s many countries worked to stop trade limits. Some formed trading blocs, or groups of countries that trade freely. Examples include the North American Free Trade Agreement (NAFTA), the European Union, and South America's Mercosur. In addition, about 150 countries joined the World Trade Organization (WTO). The WTO encourages free trade around the world.

The lifting of trade limits caused international trade to grow. However, some people questioned the idea of free trade.

If governments did not oversee trade, they warned, international companies could pay workers poorly and pollute the environment.

History

Trade developed along with civilization. Before 2000 BC people in the earliest civilizations of Mesopotamia, ancient Egypt, and the Indus Valley traded among themselves and with other peoples. As time passed, civilizations built trade routes. They used these paths to transport spices, salt, gold, and other goods over greater distances. Trade routes went over land and sea.

In the AD 1400s Europeans began exploring by sea to find new trade routes to Asia. Some explored the coast of Africa. Others crossed the Atlantic Ocean to North and South America. By the 1600s Portugal, Spain, England, France, and the Netherlands had set up colonies, or settlements, around the world.

In the 1700s the Industrial Revolution began. This was a period when people invented machines to make goods in factories. This improved manufacturing and transportation, and trade increased. An idea called *laissez-faire* capitalism soon became popular. “*Laissez-faire*” is a French phrase that means “to let do.” It meant that governments should not interfere with trade or other economic activities. It allowed companies and their owners to do whatever they wanted. Many became rich as a result.

Workers soon started labor movements to protest their poor treatment by rich companies. In the early 1900s World War I and the Great Depression led to a decline in trade. Many governments began to support workers and to control trade more strictly. The idea of free trade did not become popular again until after World War II (1939–45).

► More to explore

Capitalism • Civilization • Colony
• Economics • Tax • Transportation

Trail of Tears

In 1838 and 1839 the U.S. government took away the homeland of the Cherokee people. It forced the Cherokee to travel from the Southeast to what is now Oklahoma. Most of them had to walk all the way. This event is known as the Trail of Tears.

In the early 1800s the Cherokee got along better with the United States than most other Native American groups. Then, in 1835, gold was found on



A painting shows Cherokee taking a long forced journey called the Trail of Tears. Thousands of them died along the way.



Cherokee land in Georgia. Some white people decided to take over the land and push the Cherokee out.

In 1835 a few Cherokee signed a treaty, or agreement, with the U.S. government. They agreed to sell all Cherokee land to the United States for 5 million dollars. But most of the tribe did not think the treaty was legal. The U.S. Supreme Court agreed with them.

President Andrew Jackson and Georgia officials ignored the Court's decision. In

the fall of 1838 U.S. troops began rounding up about 15,000 Cherokee and putting them in prison camps. Local residents burned their homes. Troops then sent the Cherokee west in groups of about 1,000.

The Cherokee suffered terribly on the march, which lasted 116 days. They had to walk in the cold, and they were not allowed to rest. They did not have enough food. Some went by boat in conditions that were just as bad. About 4,000 Cherokee died.

In Oklahoma the Cherokee were given some land. Many Cherokee still live there.

► More to explore

Cherokee • Jackson, Andrew • Native Americans

Transplant

During the type of surgery called a transplant, doctors remove a part from a person's body and then replace it with a similar part. A transplant is also called a graft. The purpose of a transplant is to replace a damaged or sick body part with a part that works.

The working part can be from the person's own body or from another person. The person who gets the body part is called the recipient. If another person gives a body part, that person is called the donor. Transplant donors can be living or dead.

When a doctor moves a body part from one place to another on the same person, the operation is called an autograft. One common type of autograft is a skin graft. This operation uses skin from one area of a person's body to replace lost skin on another area.

When a doctor transplants a body part from another person into a recipient, the operation is called an allograft. Allografts can be done with many body parts, including kidneys, livers, lungs, and intestines. These parts can come from living donors. Corneas (parts of eyes needed for sight) and hearts must



Doctors can replace a damaged hip joint with an artificial joint made out of metal and plastic.

come from dead donors. Doctors also can replace certain diseased parts, including heart valves and hip sockets, with artificial, or man-made, ones.

The main problem with transplants is rejection. When this happens the body's immune system treats the new part like a germ or an infection and tries to kill it. To prevent rejection doctors give recipients medicines that keep the body from attacking the new part.

► More to explore

Immune System • Surgery

Transportation

Transportation is a general word for all the methods people use to move themselves and their goods from one place to another. Just as they have for thousands of years, people today rely on walking to travel short distances. For longer distances, people depend on animals, bicycles, automobiles, trucks, railroads, ships, and airplanes.



Some people transport themselves through a city on foot. Others use trains or cars.

Reasons for Transportation

The world's economy depends on transportation. Raw materials must be moved from where they are produced to factories, where they are processed. Food, minerals, and wood often travel by truck, railroad, or ship. Oil and gas often travel by pipeline. Next, manufactured products must be moved from factories to stores. They may travel by truck, railroad, ship, or airplane.

People need transportation to get from home to work, too. Many people drive cars to work. Others take public transportation, including buses and trains. People also take cars, trains, ships, and airplanes to get to vacation spots and to visit family and friends. Some people drive just for enjoyment.

History

Early Transportation

Walking was the main method of transportation until humans domesticated, or tamed, animals. Camels, horses, and cattle then carried goods and people. More than 5,000 years ago people invented the wheel. This allowed animals to pull carts. Ancient peoples also traveled by water, at first with simple dugout canoes and rafts.

The Persians built a system of roads in the 500s BC. The ancient Egyptians, Indians, and Chinese also built roads. By the AD 200s the Romans had built roads across Europe.

Transportation by water expanded in the Middle Ages (AD 500–1500). New ships were built with multiple sails. They were able to travel farther and faster than earlier ships that were powered by rowing. Improvements in navigation made it possible to sail farther from land. Voyages of discovery in the 1400s and 1500s opened up trade routes between distant points.

Modern Transportation

The invention of the steam engine in the 1700s was an important event in transportation history. Steam-powered boats could easily travel upriver. Steam-powered ships could cross oceans without wind. On land, inventors used steam engines to power locomotives. This led to the growth of railroads. By 1869 a railroad ran across the United States, and steamships regularly crossed



An ocean liner unloads war prisoners during World War II (1939–45). Liners were an important means of transportation during the first half of the 1900s. In peacetime they carried rich people to vacation spots and poor immigrants to new homes.

the Atlantic Ocean. Trips that had taken weeks now took days.

Builders of canals made some ocean trips much shorter. The Suez Canal in Egypt shortened the trip between Europe and Asia by thousands of miles. The Panama Canal in Panama shortened the trip between the East and West coasts of North America.

The late 1800s saw the first successful bicycles and automobiles. They made quick and easy transportation available to more people than ever before. People who bought cars demanded more and better roads.

In 1903 the U.S. inventors Wilbur and Orville Wright flew the world's first airplane. The invention of the jet engine in the 1940s made air travel the fastest transportation in history.

Transportation Problems

Advances in transportation have led to problems, however. Cars and trucks cause traffic jams, accidents, and air pollution. These vehicles also use oil for fuel. The supply of oil is limited and controlled by a few countries. To ease crowded roads, governments have worked to improve public transportation. To fight pollution, scientists are developing vehicles that run on different types of fuel.

► More to explore

Airplane • Automobile • Bicycle • Boat
• Canal • Navigation • Railroad • Road
• Ship

Tree

Trees are tall, woody plants. They usually have a stem called a trunk. Trees are the largest and oldest living things on Earth. Some trees live for hundreds or even thousands of years. There are more than 80,000 species, or types, of tree. Well-known trees include birches, firs, maples, palms, and pines.

Groups of Trees

Scientists divide trees into groups based on how they reproduce. Some trees reproduce with spores, or particles that grow into new plants. They are called tree ferns. Most trees reproduce with seeds.



People grow eucalyptus trees for their wood and oil. The leaves of some kinds of eucalyptus contain an oil used in medicines.

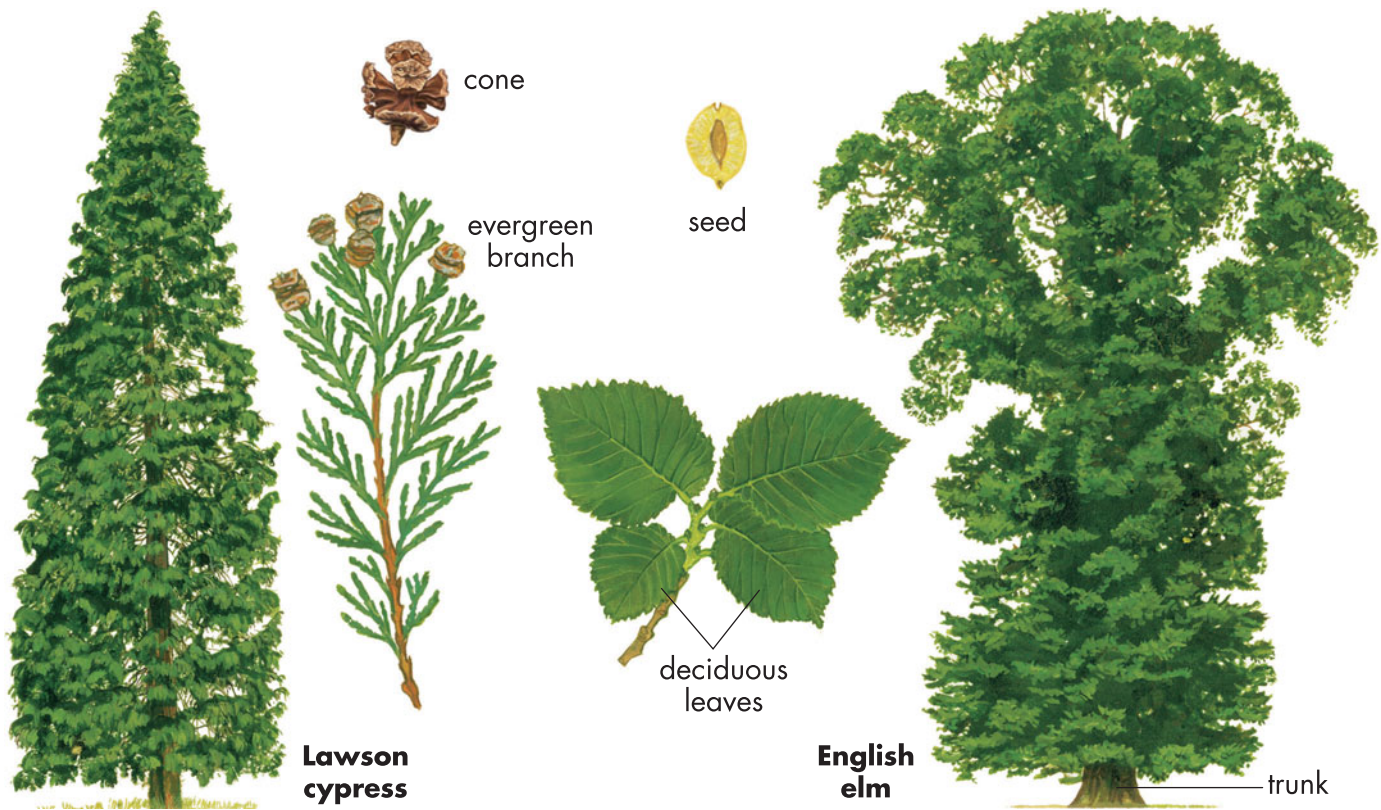
Some seed-bearing trees grow their seeds in cones. They are called conifers. Most conifers have needle-shaped leaves. Other seed-bearing trees grow their seeds in fruits or pods. They are known as

broad-leaved or flowering trees. They have broad, flat leaves.

Scientists also group trees based on whether they lose their leaves. Trees that keep their leaves year-round are called evergreens. Trees that lose their leaves at some point during the year are called deciduous trees.

Physical Features

Trees are usually more than 10 feet (3 meters) tall. They have roots, a trunk, branches, and leaves. The trunk and branches are made of fibers called wood. These fibers are protected by an outer covering called bark. As the tree ages, the trunk and branches thicken.



The Lawson cypress and the English elm look different because they are two different types of tree. The Lawson cypress is a conifer and an evergreen. It produces seeds in cones and has needlelike leaves that stay on all year. The English elm is broad-leaved and deciduous. It produces seeds in fruits and has leaves that fall off in autumn.

The leaves make food for the tree through a process called photosynthesis. Veins run through the leaves. They carry water and food to and from the branches. Leaves are usually green. The leaves of deciduous trees often change colors in autumn before they fall off. New leaves then grow in spring.

Uses

Trees are very important to people. Tree wood is used to build homes and furniture. Paper is made from wood fibers. Many people burn wood to cook and to heat their homes. Farmers plant trees that grow fruit for people to eat.

Trees also help keep the air clean. They release oxygen for animals, including humans, to breathe. They take in the carbon dioxide that animals breathe out.

► More to explore

Bark • Birch • Conifer • Fir • Maple
• Palm • Photosynthesis • Pine • Plant

Trenton



Population
(2000 census)
85,403; (2007
estimate)
82,804

Trenton is the capital of the U.S. state of New Jersey. In 1776, during the Ameri-



The State House in Trenton is the meeting place of the New Jersey General Assembly, or state legislature.

can Revolution, American troops won an important battle in the city.

Government is the largest employer in Trenton by far. Many other people in the city work in health care, trade, and other service industries. Factories in Trenton make medicines, metal products, and pottery.

The first Europeans to settle in the area that is now Trenton arrived in 1679. In 1714 a businessman named William Trent established the town. It was later named Trenton in his honor.

The battle of Trenton took place in December 1776, during the American

Revolution. General George Washington led American troops across the Delaware River. The next day they launched a surprise attack on British troops in Trenton. The Americans won the battle.

Trenton was the temporary capital of the United States in 1784 and again in 1799. It became the capital of New Jersey in 1790.

► More to explore

American Revolution • New Jersey

Triceratops

The dinosaur known as *Triceratops* looked something like a modern rhinoceros. However, it had three sharp horns on its head. The name *Triceratops* means “three-horned face.” *Triceratops* also had a bony neck frill that surrounded the head like a huge collar.

When and Where *Triceratops* Lived

Triceratops lived about 70 to 65 million years ago. It was among the last dinosaurs to live on Earth before the dinosaurs disappeared. Fossils, or remains, of

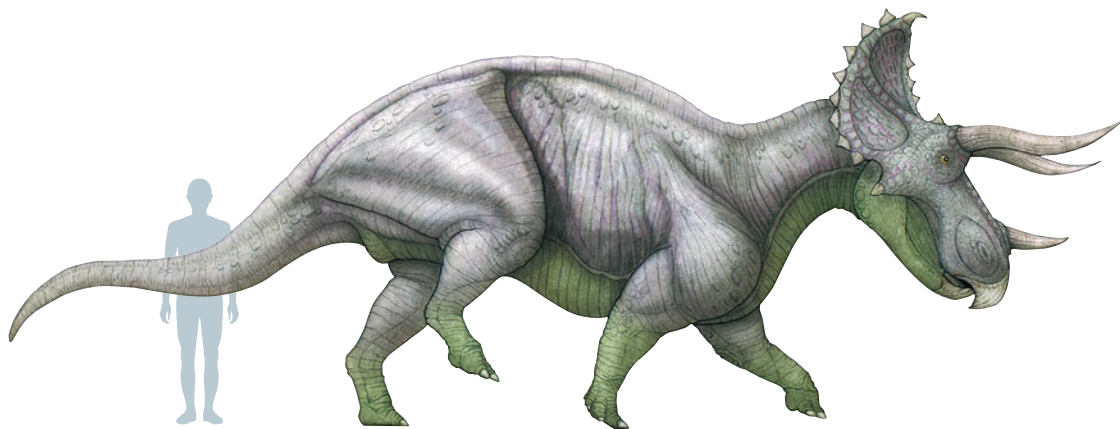
Triceratops have been found in North America.

Physical Features

Triceratops was the largest of the horned dinosaurs. It weighed up to 5 tons and reached a length of nearly 30 feet (9 meters). The skull and neck frill of *Triceratops* often measured more than 6 feet (2 meters) long. Each of the two horns above the eyes was longer than 3 feet (1 meter). The horn on the snout was short and thick. The massive body of *Triceratops* was supported by four sturdy legs. Its back legs were longer than its front legs. It had feet like an elephant. *Triceratops* had a fairly short, thick tail.

Behavior

Triceratops was a slow-moving plant eater. The neck frill acted as a protective shield against such enemies as *Tyrannosaurus rex*. *Triceratops* also used its long horns to defend itself and to fight rival males. *Triceratops* lived and traveled together in groups. Adults may have protected their young by forming an outward-facing circle around them.



Triceratops

Trinidad and Tobago



Children dress in colorful costumes for a carnival celebration in Trinidad and Tobago.

The Republic of Trinidad and Tobago is an island country in the Caribbean Sea. The capital is Port of Spain.

The island of Trinidad is larger than the island of Tobago. Trinidad is only about 7 miles (11 kilometers) from the coast of Venezuela in South America. Both islands are mountainous. Trinidad has many short rivers, but Tobago has only a few streams. The country has a warm climate with dry and rainy seasons.



Tropical rain forests grow in the high areas. The islands' animals include golden tree frogs, porcupines, armadillos, wild pigs, and rodents. The scarlet ibis is the country's national bird.

Blacks and East Indians each make up about 40 percent of the population. Most of the rest of the people have mixed roots. English is the main language. More than half of the people are Christians. Many of the East Indians follow Hinduism or Islam.

Trinidad and Tobago has a strong economy. The country produces petroleum (oil) and natural gas. Manufacturing and tourism are also important to the islands. The country's products include sugar, chemicals, fertilizers, steel, and cement. Farmers grow sugarcane, oranges, rice, coffee, and cocoa.

Arawak Indians lived on Trinidad when Christopher Columbus arrived in 1498. As the Spanish took control, almost all the Indians died. French settlers came in the 1700s. They brought Africans with them as slaves. Great Britain took over Trinidad in 1797 and Tobago in 1814. The British brought people from India to work on plantations.

Trinidad and Tobago gained independence in 1962. The country discovered its huge oil and gas deposits in 1998.

► More to explore

Caribbean Sea • Port of Spain

Facts About TRINIDAD AND TOBAGO



Population
(2008 estimate)
1,305,000

Area
1,980 sq mi
(5,128 sq km)

Capital
Port of Spain

**Form of
government**
Republic

Major cities
Chaguanas, San
Fernando, Port of
Spain, Arima,
Point Fortin

Tripoli



Population
(2005
estimate), city,
911,643; urban
area,
2,098,000

Tripoli is the capital of Libya, a country in northern Africa. The city lies on a piece of rocky land overlooking the Mediterranean Sea. It is Libya's largest city and main seaport.

Shipping oil and other goods through the port brings money to Tripoli. The city is also Libya's main center of business and industry.

In ancient times the city was called Oea. People called the Phoenicians founded it in the 600s BC. It was one of the three main cities in the Phoenician region called Tripolitania, which means "Three



A child plays near the People's Palace in Tripoli, Libya. The building was the king's palace when Libya was a kingdom.

Cities." The city became part of the Roman Empire and later the Byzantine Empire.

Muslim Arabs conquered Tripoli and the rest of Libya in about AD 645. The Turkish Ottoman Empire ruled Libya from 1551 until 1911. Then Italy and, later, Great Britain controlled Libya. In 1951 Libya became an independent country with Tripoli as its capital.

► More to explore

Libya

Tropical Rain Forest

► see Rain Forest.

Tropics

The region of Earth's surface that is closest to the equator is called the tropics. Two imaginary lines that circle the globe mark the boundaries of the tropics. The line called the Tropic of Cancer marks the northern edge. Its latitude (distance from the equator) is $23^{\circ} 27' \text{ N}$. The line called the Tropic of Capricorn marks the southern edge. Its latitude is $23^{\circ} 27' \text{ S}$.

The tropics are the only part of Earth where the sun sometimes shines straight down. Because the sunlight is so strong, the tropics are generally warmer than other parts of Earth. Tropical temperatures are warm or hot throughout the year. The temperatures do not change



greatly, but winds and rain bring different types of weather. Most tropical places experience wet and dry seasons.

Areas closest to the equator are the wettest. A great deal of rain falls year-round. Dense rain forests cover the land. The largest tropical rain forests on Earth lie in Brazil and in parts of Africa.

The climate is drier in tropical regions that lie farther north and south of the equator. In these regions there are one or two dry seasons each year. The forests may be deciduous, meaning that the trees shed their leaves during the dry periods. Savannas, or grasslands with scattered trees, are also common.

The driest parts of the tropics lie near the northern and southern edges. Here the dry season is long. Few trees grow. Shrubs and low grasses cover the land. Two of Earth's big deserts, the Sahara and the Kalahari, lie on the edges of the tropics.

Many plants and other products that people value come from the tropics. Some of these are bananas, coffee, cocoa, tea, rubber, spices, nuts, and tropical wood.

► More to explore

Desert • Equator • Rain Forest

Trout

Trout are a kind of fish that many people like to catch and eat. Trout are closely related to salmon. Most species, or types, of trout are freshwater fish. Many live in clear, cool streams and lakes. Some types live in the ocean but return to freshwater to breed.

There are two main groups of trout species: black-spotted trout and speckled trout. The species of black-spotted trout include rainbow, cutthroat, and golden trout. Black-spotted trout range in color from silver, brown, or dark gray to shiny green, blue, red, or gold. They all have small black spots on the back.

The species of speckled trout include brook, Dolly Varden, lake, and bull trout. Some speckled species are also called chars. Speckled trout have lighter spots on a darker body. Many speckled species have pinkish or red spots, especially on the underside.

The brown trout is separate from the black-spotted trout and speckled trout. It has a brown body with black spots.



The rainbow trout is popular with people who fish for sport.

Trout vary in size, depending on the species. Many species of trout are about 1 foot (30 centimeters) long.

Trout eat insects, small fish, and eggs of other fish. Many species spawn, or reproduce, in the spring or the fall. The females bury their eggs in gravel nests that they dig in the bottom of streams. The eggs hatch after two or three months.

► More to explore

Fish • Salmon

Truman, Harry S.

After President Franklin D. Roosevelt died in 1945, Vice President Harry S. Truman became the 33rd president of



Harry S. Truman was the 33rd president of the United States.

the United States. Truman led the country through the end of World War II. After the war he worked to stop the spread of Communism.

Early Life and Career

Truman was born in Lamar, Missouri, on May 8, 1884. He was the oldest of the three children of John Anderson Truman, a farmer, and Martha Young. Harry graduated from high school in Independence, Missouri.

A member of the Missouri National Guard, Truman volunteered to serve in World War I in 1917. He fought in France and then returned to the United States in 1919. That year he married Elizabeth (Bess) Wallace. They had one daughter.

With an Army friend, Truman opened a men's clothing store in Kansas City. The business failed in the early 1920s.

Political Career

The Democrats who controlled Kansas City got Truman elected as a county judge in 1922. In 1934 he won a seat in the U.S. Senate.

In 1944 President Roosevelt chose Truman as his vice presidential running mate. After winning the election, Roosevelt died suddenly on April 12, 1945. Truman then became president.

Presidency

World War II in Europe soon ended, but war with Japan continued. Hoping to prevent more U.S. deaths by making



TIMELINE

Truman is born in Lamar, Missouri.		Roosevelt dies; Truman becomes president.		The Korean War begins.		Truman dies in Kansas City, Missouri.
May 8, 1884	1944	April 12, 1945	August 1945	1950	1953	December 26, 1972
	Truman is elected vice president under Franklin D. Roosevelt.		Truman orders atomic bombs dropped on Japan; World War II ends.		Truman retires from office.	

Japan surrender, Truman decided to use the newly invented atomic bomb in Japan. In early August 1945 U.S. airplanes dropped atomic bombs on the cities of Hiroshima and Nagasaki. The bombs killed more than 100,000 men, women, and children. Japan surrendered on August 14, 1945.

After the war Truman helped the United States join the United Nations, a new international peace organization. He also introduced the Truman Doctrine. That policy said that the United States would fight the spread of Communism, the political system of the Soviet Union.

In 1948 Truman approved the Marshall Plan. Under the plan the United States sent billions of dollars to help rebuild Europe. By strengthening the economies of western Europe, the plan prevented Communism from spreading there. That year Truman also ordered desegre-

gation (the mixing of races) in the U.S. military.

After beginning his second term in 1949, Truman presented a program of reforms called the Fair Deal. He wanted more public housing, more money for education, higher wages, government-protected civil rights, and national health insurance. Congress did not pass most of the Fair Deal reforms, but citizens debated Truman's ideas for years to come.

The Korean War began during Truman's second term. In 1950 Communist North Korea invaded South Korea. Backed by the United Nations, Truman ordered U.S. military forces to help South Korea. The war dragged on past the end of Truman's presidency.

Retirement and Death

After his term ended in 1953, Truman retired to Independence, Missouri. He

died in Kansas City, Missouri, on December 26, 1972.

► **More to explore**

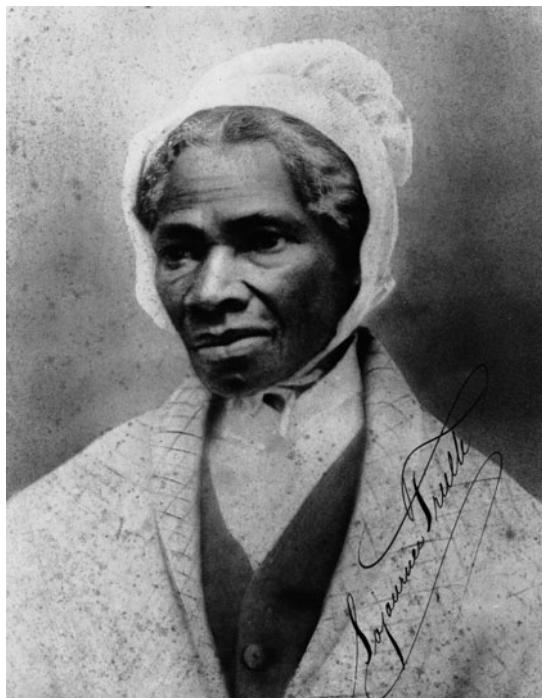
Communism • Korean War • Roosevelt, Franklin D. • United Nations • United States • World War II

Truth, Sojourner

Sojourner Truth spoke out against slavery and for women's rights in the 1800s. Her courage and powerful way of speaking helped the causes of both African Americans and women in the United States.

Early Life

Truth was born a slave in the U.S. state of New York in about 1797. She was originally named Isabella Baumfree. Isabella worked for several different owners. Her last owner, Isaac Van Wagener, freed her just before slavery ended



Sojourner Truth

in New York in 1827. Isabella took the last name Van Wagener.

Speaking Out

In 1829 Isabella moved to New York City and worked as a house cleaner. In 1843 she left New York to become a traveling preacher. She also changed her name to Sojourner Truth.

Truth discovered that some people had started working to end slavery. This movement was called abolitionism. She began speaking out against slavery in the late 1840s. She soon became a popular abolitionist speaker throughout the North and the Midwest. In 1850 Truth published her life story, called *The Narrative of Sojourner Truth*.

Truth also defended women's rights. She complained that women could not vote or serve on juries. She also pointed out that they received less money than men for the same work.

Later Years

After the American Civil War started in 1861, Truth became even more famous. In 1864 she visited Washington, D.C., where she met President Abraham Lincoln. Also in 1864 Truth took a job with the National Freedmen's Relief Association, a group that helped former slaves.

In 1875 Truth retired to her home in Battle Creek, Michigan. She died there on November 26, 1883.

► **More to explore**

Abolitionist Movement • African Americans • Women's Rights

Tsar



Ivan IV, known as Ivan the Terrible, was the first Russian ruler to use the title of tsar.

When Russia had a royal family, the emperor was called the tsar. A Russian empress's title was tsarina, a prince's title was tsarevich, and a princess's title was tsarevna. Tsars ruled Russia from 1547 to 1917.

The term tsar (also spelled czar) is the Russian version of Caesar, the family name of Julius Caesar and the first emperors of Rome. The link between Rome and Russia was the Byzantine Empire, which began as the eastern branch of the Roman Empire and fell in 1453. In 1472 Ivan III, the prince of Moscow, married the niece of the last Byzantine emperor. Ivan III's grandson, Ivan IV, was the first Russian ruler to

use the title of tsar. Known as Ivan the Terrible, he had great power and ruled harshly. Later tsars had similar qualities.

In 1721 Peter the Great stopped using the title of tsar. Even so, Russia's emperors continued to be called tsars until the last of them, Nicholas II, was removed from the throne. Revolutionaries killed Nicholas and his entire family in 1918 so that no descendants could claim the title in the future.

► More to explore

Caesar, Julius • Ivan IV • Nicholas II
• Peter the Great • Russia

Tshwane

► see Pretoria.

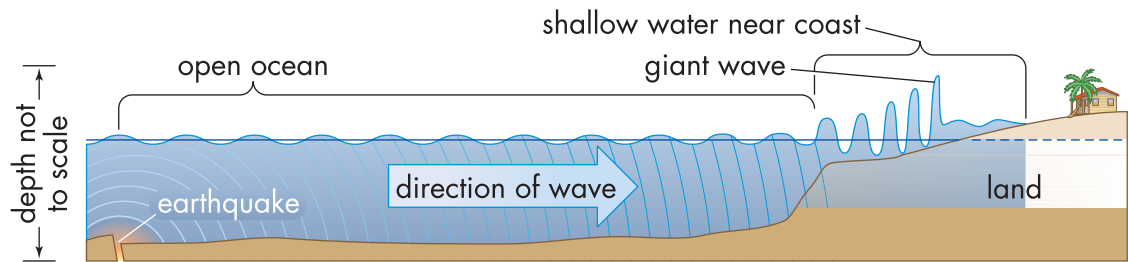
Tsunami

Natural disasters, both on land and under the ocean, may cause deadly ocean waves called tsunamis. By the time a tsunami reaches shore, it has gained tremendous size and power. Tsunamis can wipe out entire coastal villages or towns.

Earthquakes, landslides, or volcanic eruptions can trigger waves in a nearby ocean. These waves may travel for thousands of miles. They may move as fast as 500 miles (800 kilometers) an hour. As they approach a coastline, the waves move more slowly. They also rise, often to heights as great as 100 feet (30 meters). As the first huge wave nears

Did You Know?

Tsunami is a Japanese word. Tsunamis used to be called tidal waves, but they have nothing to do with tides.



A diagram shows the different elements of a tsunami. An undersea earthquake causes waves to spread out in the ocean. As the waves approach a coast, they hit land under the water. This makes the waves much larger.

land, the coastal water often draws back dramatically. Then the tsunami hits the land.

Tsunamis cannot be stopped, but there are ways to defend against them. Scientists around the world watch for early signs of earthquakes. They also note unusual changes in ocean levels. With this information, scientists can warn people to leave areas that a tsunami might hit.

The Pacific Ocean is the site of many tsunamis, but tsunamis can form in the Atlantic and Indian oceans, too. A powerful earthquake struck beneath the Indian Ocean in December 2004. The earthquake set off tsunamis that hit about 10 countries. More than 200,000 people died.

► More to explore

Earthquake • Ocean

Tuberculosis

Tuberculosis, or TB, is a disease that usually affects the lungs. Tuberculosis used to be a leading cause of death in Europe and North America. Today tuberculosis is treatable.

Certain types of tiny living things called bacteria cause tuberculosis. One type of bacteria causes most cases of tuberculosis in humans. It infects the lungs. This may lead to coughing, chest pain, difficulty breathing, loss of energy, and weight loss. The person may even cough up blood. Infected people spread the disease to others when they cough or sneeze.

Another type of bacteria causes a less common form of tuberculosis. This form of tuberculosis may damage the bones and joints. Humans get it by



A doctor looks at the chest X-rays of patients infected with tuberculosis.

drinking milk from a cow infected with the bacteria. This form of tuberculosis can be prevented by pasteurizing milk, or heating it to kill the bacteria.

Tuberculosis spreads most easily in crowded places where living conditions are poor. In some countries people get something called a vaccine to protect them from tuberculosis. If people do get tuberculosis, doctors treat them with a medicine called an antibiotic. People given antibiotics have a good chance of recovering from the disease.

► More to explore

Bacteria • Disease, Human • Lung

Tubman, Harriet



Harriet Tubman

In the middle of the 1800s Harriet Tubman escaped from slavery in the southern United States. She then helped lead many other runaway slaves to freedom. She also served the Union during the American Civil War.

Harriet Tubman was born in about 1820 in Dorchester County, Maryland. She was one of 11 children of a slave family. Her name at first was Araminta Ross. She later changed her first name to Harriet, which was her mother's name.

In about 1844 Harriet married a free African American named John Tubman. In 1849, after hearing that she was to be sold, she escaped to Philadelphia, Pennsylvania, without her husband.

In Pennsylvania Tubman became a “conductor” for the Underground Railroad. The railroad was a secret network that helped escaped slaves to find their way to freedom. By 1857 she had freed hundreds of slaves, including her own parents. She said that she “never lost a passenger,” even though slaveholders offered large rewards for her capture.

During the American Civil War, Tubman went to South Carolina with the Union Army. She served as a nurse and a scout. She even led raids against the Confederates.

After the Civil War Tubman settled in Auburn, New York, with her parents. There she worked for racial justice and also for women's rights. She believed that the two struggles were closely linked. In 1908 she opened a home for aged and poor African Americans. Harriet Tubman died in Auburn on March 10, 1913.

► More to explore

African Americans • American Civil War
• Slavery • Underground Railroad

Did You Know?

Tubman was called “the Moses of her people” because she led black people to freedom. (Moses led the Jewish people to freedom in ancient times.)

Tulip

Tulips are plants that bloom in early spring. The flowers are cup-shaped and very colorful. They are among the most popular garden flowers. There are about 4,000 varieties of tulip. They belong to the lily family.

Tulips first grew in south-central Asia. People brought the flowers to Europe in the 1500s and later to many different parts of the world. The Netherlands became the center of tulip production in the 1600s. It still is today.

Tulips normally grow from bulbs that are planted in autumn. Each bulb produces a plant each spring for a few years. A tulip plant has two or three thick, bluish green leaves. These are attached at the bottom of the stem. In most types of tulip each stem grows a single flower.

Tulip flowers occur in almost every color—white, yellow, pink, red, orange,



Tulips surround the trunks of birch trees.

purple, and even brown and black. The color is either solid or streaked. Streaked tulips get their streaks because of a harmless virus. The virus makes the top color disappear in some places. The flower's underlying white or yellow color then shows through.

► More to explore

Flower • Lily • Netherlands, The

Tuna

Tuna are large fish that live in most parts of the world's oceans. They belong to the same family of fish as mackerel. Tuna is one of the most popular foods that comes from the sea. Most of the tuna that fishers catch is canned.

There are seven different species, or types, of tuna: bluefin, albacore, yellowfin, bigeye, blackfin, longtail, and southern bluefin. The skipjack tuna is related to these species, but it belongs to a separate group of fish.

A tuna has a long, rounded body. It is usually dark on top and silvery underneath. Some species have spots or stripes.

Many species of tuna are about 35 inches (90 centimeters) long. The bluefin tuna is the largest species. It can grow as long as 14 feet (4 meters) and weigh up to 1,800 pounds (800 kilograms).

Tuna travel in large groups called schools. Some species travel long distances. Tuna feed on other fish, including herring, menhaden, and mackerel.



The bluefin tuna is the largest type of tuna.

Some species also eat small, spineless animals such as squid. Some types of tuna return to the waters where they hatched to spawn, or produce eggs.

► More to explore

Fish

Tundra

Tundras are large, barren regions with no trees. In fact, the word tundra comes from the Finnish word *tunturia*, which means “treeless plain.” Tundras lie between the permanent ice of the far north and the northern forests of North America, Europe, and Asia. They cover about 20 percent of Earth’s surface.

Features

Tundras may be flat, hilly, or mountainous. Little plant life grows on the bare or rocky ground. Tundras in coastal areas tend to be foggy. Snow covers the world’s tundras for more than six months of the year.

Types of Tundras

Arctic tundras lie in northern Europe, Russia, Alaska, Canada, and Greenland.

In these tundras the winter temperature may be as low as -25°F (-32°C). The summer temperature may rise only to 40°F (4°C). Because of these cold temperatures, Arctic tundras have a permanent layer of frozen soil, called permafrost. Some permafrost reaches as deep as 1,500 feet (456 meters).

Alpine tundras lie farther south than Arctic tundras. Alpine tundras are found in high mountains above the tree line. (The tree line is the highest place where trees can grow.) They have short, cool summers and less extreme winters than Arctic tundras. Alpine tundras do not have a layer of permafrost.

Life in a Tundra

Only low-growing plants, such as mosses and shrubs, can survive in tundras. Plantlike living things called lichens also grow there.

Tundra animals must be able to survive long, cold winters. Many birds live there in the summer, but few stay through the winter. Some common tundra animals



Reindeer graze on the Arctic tundra of Canada’s Northwest Territories.

are reindeer, Arctic foxes, snowy owls, musk oxen, and polar bears.

Very few people live in tundras. Arctic peoples, including the Eskimo (Inuit), tend to live in places where hunting and fishing can provide enough food year-round.

Resources

The ground of many tundras contains coal, oil, iron ore, lead, or other resources. Many companies have set up mining operations in tundra regions. However, some people worry that mining and oil drilling endangers tundra plants and animals.

► More to explore

Eskimo • Lichen • Mining

Tunis



Population
(2007 estimate)
745,000

Tunis is the capital of Tunisia, a country in northern Africa. It is the largest city in Tunisia by far. Tunis lies near the coast of the Mediterranean Sea. A canal links it to a port on the sea.

Tunis is Tunisia's center of industry. Factories in the city make food products, cloth, clothing, and electronics. Many



The Grand Mosque of Tunis, Tunisia, is decorated with colorful tiles.

people in Tunis work in banking, tourism, or other service industries.

People called the Libyans founded Tunis in ancient times. Later, people called the Phoenicians built the city of Carthage nearby. Carthage became a great power. Tunis came under its rule. The Romans destroyed Tunis during a war with Carthage in 146 BC. They later rebuilt Tunis as a city of the Roman Empire.

Arabs captured Tunis in the AD 600s. The city later became the capital of a Muslim empire. In the 1200s Tunis was one of the leading cities in the Muslim world.

Tunis and the rest of Tunisia became part of the Turkish Ottoman Empire in 1574. France took control of Tunisia in 1881. In 1956 Tunisia became an independent country with Tunis as its capital.

► More to explore

Carthage • Tunisia

Tunisia

Tunisia is the smallest country in North Africa. In ancient times Tunisia was the site of the great city of Carthage. Today Tunisia's capital is Tunis.

Geography

Tunisia shares borders with Algeria and Libya. The Mediterranean Sea lies to the east and the north. Tunisia is only about 100 miles (160 kilometers) from Sicily, an island of Italy.

Mountain chains run through northern Tunisia. The country's largest river, the Majardah, flows through the north. The central part of Tunisia is a large plateau, or area of flat, raised land. There are shallow salt lakes farther south. The southern tip of Tunisia is a part of the Sahara Desert. The land there is sandy and rocky.

Northern Tunisia has mild, rainy winters and hot, dry summers. The south is warmer and drier.

Plants and Animals

Most of Tunisia's plants and animals are in the cooler northern region. The north has vineyards and forests of cork oak and evergreen oak. Thorny bushes and grasses grow farther south. The Sahara region in the far south has few plants.

Tunisia's animals include hyenas, wild boars, jackals, gazelles, and cobras. Scorpions live throughout the country.

People

Most of Tunisia's people have a mixture of Arab and Berber roots. (The Berbers were the first people in the region.)

Most Tunisians call themselves Arabs.

The main language is Arabic, but many people also speak French. Almost all the people are Muslims. More than half of all Tunisians live in cities and towns.

Most people live near the Mediterranean coast.

Economy

Tourism and other services are key parts of Tunisia's economy. Manufacturing and mining are also important. The country's factories make processed foods, steel, chemicals, clothing, and leather goods. Tunisia also produces oil. Mines provide phosphates and iron. Tunisia uses the phosphates to make chemicals and fertilizers.





Tunisia is home to many ancient buildings, including Islamic buildings called *ribats*. *Ribats* served as both monasteries and fortresses.

Facts About TUNISIA



Population
(2008 estimate)
10,325,000

Area
63,170 sq mi
(163,610 sq km)

Capital
Tunis

Form of government
Republic

Major cities
Tunis, Sfax, Sousse, Al-Ariana, Ettadhamen, Susah

Many Tunisians work in agriculture. Wheat and barley are the main food crops. Farmers also grow olives, tomatoes, sugar beets, citrus fruits, and dates. Sheep, goats, and cattle are the main livestock.

History

In ancient times Tunisia was a colony of the Phoenicians, a people from what is now Lebanon. In the 800s BC the Phoenicians founded the city of Carthage near what is now Tunis. By the 400s BC the city controlled trade in the western Mediterranean Sea. In the 200s and 100s BC Carthage fought Rome in a series of wars. The Romans destroyed Carthage in 146 BC and took over the land.

Muslim Arabs invaded the region in the AD 600s. Spain and the Ottoman Turks

battled for control of the area in the 1500s. In 1574 the Turks defeated the Spanish and made Tunisia a part of the Ottoman Empire. As the Ottomans weakened in the late 1800s, France, Great Britain, and Italy tried to control the region. Tunisia became a territory of France in 1881. France allowed Tunisia's bey, or king, to stay on the throne, but the French held the real power.

Tunisia gained independence from France in 1956. The next year Tunisia ended its monarchy. The country's first president stayed in power until 1987. Tunisia's second president held power into the 21st century.

► **More to explore**
Carthage • Tunis

Turkey



Parts of Turkey are very mountainous.

The Republic of Turkey lies partly in Asia and partly in Europe. For centuries Turkey was the heart of two great empires—the Christian Byzantine Empire and the Islamic Ottoman Empire. Modern Turkey's capital is Ankara.

Geography

Most of Turkey is on a peninsula in southwestern Asia. A peninsula is a piece of land surrounded by water on three sides. The peninsula is known as Anatolia or Asia Minor. A small part of Turkey is in southeastern Europe. Narrow waterways and the Sea of Marmara separate the two parts of Turkey.

The Black Sea lies north of Turkey. Georgia, Armenia, and Iran are to the east. Iraq, Syria, and the Mediterranean Sea lie to the south. The Aegean Sea, Greece, and Bulgaria lie to the west.

The Asian part of Turkey has mountains and a central plateau, or

raised flat area. The highest peak is Mount Ararat, which rises 16,853 feet (5,137 meters). The European part of Turkey is lower and flatter. The country's longest river, the Kizil, flows through the peninsula.

Most of Turkey has a dry climate with hot summers. Winters are cold in central Turkey and mild near the coasts. Earthquakes are common.

Plants and Animals

Grasslands cover much of the country. Pine, oak, cedar, juniper, and chestnut trees grow along the coast.

Deer, wild goats, bears, and lynx live near the Mediterranean coast. Gazelles and hyenas live in central and eastern Turkey. Wolves, jackals, badgers, and otters live throughout the country. Turkey's birds include buzzards, storks, vultures, and eagles.



People

Most of Turkey's people are Turks. They speak a language called Turkish. Most of the rest of the people are Kurds. They live in eastern Turkey and have their own language. Almost all the people of Turkey follow Islam.

More than half of the population lives in cities and towns. Turkey's largest city is Istanbul.

Economy

Services and manufacturing are the main parts of Turkey's economy. Services include communications, transportation, and tourism. Manufacturers produce fabrics, clothing, processed foods, iron and steel, chemicals, cars, and electronics. Turkey's land provides oil, coal, copper, and other minerals.



The Hagia Sophia in Istanbul, Turkey, has been a Christian church and a Muslim mosque. Now it is a museum.

Many Turks are farmers. Wheat, sugar beets, citrus fruits, cotton, olives, tobacco, and figs are important crops. Sheep, cattle, and goats are the main livestock.

History

Humans have lived in the Asian part of Turkey, called Anatolia, since at least 7000 BC. The Hittite people invaded in about 2000 BC. Greeks and Persians later fought over the land. Romans took over Anatolia by about 30 BC.

Byzantine Empire

Under the Roman Empire, Anatolia was at peace. In AD 395 the Roman Empire was divided into western and eastern parts. The eastern part became known as the Byzantine Empire. Its capital was the city of Constantinople (now called Istanbul). Christianity was the main religion of the Byzantine Empire.

The Seljuk Turks invaded Anatolia beginning in the 1040s. The Seljuk Turks were Muslims from central Asia. In 1071 they defeated the Byzantine army. During the next 200 years the Christians of Europe fought the Turks in a series of wars known as the Crusades.

Ottoman Empire

In the late 1200s a new group of Turks gained power in Anatolia. They founded the great Ottoman Empire. In 1453 the Ottoman Turks captured Constantinople. They renamed the city Istanbul and made it their capital.



TIMELINE

Hittites invade Anatolia.		Anatolia becomes part of the Byzantine Empire.		The Ottoman Turks gain power.		Kurds begin fighting the Turkish government.
about 2000 BC	about 30 BC	AD 395	1071	1300	1923	1983
	Romans take control of Anatolia.		The Seljuk Turks defeat the Byzantines.		The Republic of Turkey is formed.	

By the mid-1500s the Ottoman Empire stretched across North Africa, the Middle East, and southeastern Europe. The empire then grew weaker. It collapsed at the end of World War I in 1918.

Turkey Under Atatürk

After the war many Turks were angry at the Ottoman government, which had lost much of the empire's land. A military leader named Mustafa Kemal formed a separate government. In 1923 he founded the new country of Turkey. The city of Ankara became the new capital. Kemal became Turkey's first president.

Kemal ruled with strong powers. He soon took the name Atatürk, which is Turkish for "father of the Turks."

Atatürk wanted to make Turkey a more modern country. He closed Islamic schools and courts. He banned traditional clothes such as the fez, a type of

Turkish hat. He also gave women the right to vote. Atatürk died in 1938.

Turkey After Atatürk

In 1960 and 1980 the military took over Turkey's government. In 1997 the military forced the prime minister to step down. Each time Turkey returned to democracy.

Beginning in the 1950s Turkey disagreed with Greece over control of the island of Cyprus. Turkish forces invaded northern Cyprus in 1974. Turkey supported the Turks of Cyprus when they formed a separate country in 1983.

Modern Turkey has also faced a long rebellion by Kurds in the east. The Kurds fought the Turkish government from the 1980s into the 21st century.

► More to explore

Ankara • Byzantine Empire • Cyprus • Islam • Istanbul • Kurd • Ottoman Empire

Facts About TURKEY



Population
(2008 estimate)
71,002,000

Area
299,158 sq mi
(744,815 sq km)

Capital
Ankara

Form of government
Republic

Major cities
Istanbul, Ankara, Izmir, Bursa, Adana

Turkey



Two male common turkeys in the wild display their feathers.

Turkeys are large birds. They are found in the wild and they are also raised for food. The two species, or types, of turkey are the common turkey and the ocellated turkey.

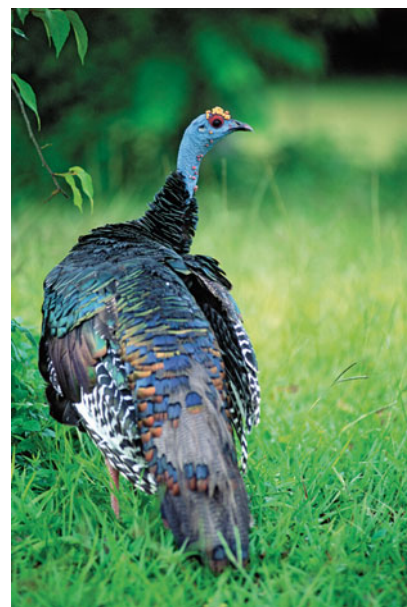
The common turkey prefers places with mild temperatures. It usually has black feathers mixed with a shiny green or bronze color. The head and neck are

featherless, bumpy, and bright red. Males have a piece of red skin growing from the forehead. Male turkeys often make a gobbling sound while females make a clicking noise.

Some common turkeys live in the wild. They are found in parts of Mexico and the United States. Wild turkeys prefer forests and swamps. Males weigh about 22 pounds (10 kilograms), but females are much smaller. Wild turkeys can fly, but only for short distances.

Many common turkeys are kept on farms and raised for food. These turkeys are usually heavier, and they cannot fly. Their feathers are usually white.

The ocellated turkey is found in Central America. It is much smaller than the common turkey. It has a blue head and neck with reddish yellow bumps. Its tail feathers are tipped with blue and gold, somewhat like a peacock. The ocellated turkey is not raised for food.



(Left) Many turkeys are raised for their meat; (right) ocellated turkeys live only in the wild.

Turkmenistan



A vendor sells dried fruits and nuts at a market in Turkmenistan.

Turkmenistan is a desert country in central Asia. The capital is Ashgabat.

Turkmenistan is on the southeastern coast of the Caspian Sea. It shares borders with Kazakhstan, Uzbekistan, Afghanistan, and Iran.

The sandy Karakum Desert covers most of the land. Southern Turkmenistan has some mountains and hills. Turkmenistan



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has a very dry climate with hot summers and cold winters.

Grasses and shrubs grow in the dry areas. Fig and nut trees grow near the mountains. Foxes, wildcats, cobras, lizards, and gazelles live in the desert. Leopards and porcupines live in the hills.

Turkmenistan is named after its main group of people, the Turkmen. The country also has some Uzbeks, Russians, and Kazakhs. Most of the Turkmen are Muslims. The people live mainly in southern oases (desert areas with a water supply) and along the rivers in the east.

The economy of Turkmenistan depends on agriculture and the production of natural gas and oil. Farming is possible with the help of irrigation, or artificial watering systems. The main crops are cotton and grain. People also raise sheep and use their wool to make carpets. Factories produce metals, machinery, chemicals, and fabrics.

The Parthian Empire of Iran ruled the region in ancient times. Turkmen nomads, or wanderers, entered the area by AD 1100. Russia conquered the region by 1881. In 1925 Turkmenistan became part of the Soviet Union. Turkmenistan gained independence in 1991.

► **More to explore**
Ashgabat



Facts About TURKMENISTAN



Population
(2008 estimate)
5,180,000

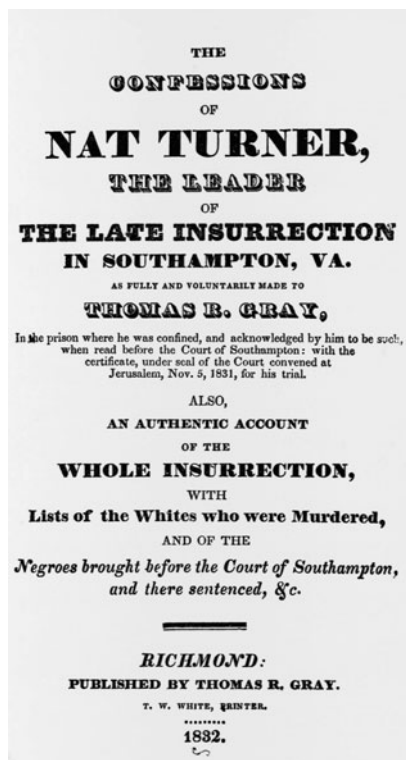
Area
188,500 sq mi
(488,100 sq km)

Capital
Ashgabat

Form of government
Republic

Major cities
Ashgabat, Turkmenabat, Dashhowuz, Mary, Balkanabat

Turner, Nat



An account of Nat Turner's slave rebellion was published in 1832.

In the United States before the American Civil War, many slaves escaped to freedom. Others rebelled with violence against their owners. A slave named Nat Turner led one of the bloodiest slave revolts in U.S. history. Southern states reacted to Turner's revolt by passing laws that made the lives of slaves even more difficult.

Early Life

Nat Turner was born on October 2, 1800, on a farm in Virginia. He had several owners. In 1831 he joined the household of a man named Travis.

Unlike most slaves, Turner learned to read and write. He also learned about the Christian religion. He came to

believe that God had chosen him to free all slaves.

Revolt

On August 21, 1831, Turner and seven other slaves killed everyone in the Travis family. In the next two days, Turner picked up about 75 followers. They killed about 60 white people.

Then about 3,000 whites rose up to stop the revolt. Whites killed most of Turner's men. Whites captured Turner, put him on trial, and put him to death on November 11, 1831.

Turner's revolt frightened Southern whites. They blamed his rebellious spirit on his education, so they tried to stop slaves from learning to read and write. They also tried to stop slaves from gathering in groups.

► More to explore

Slavery

Turtle

A turtle is a reptile that has a shell covering its body. Turtles are known for moving very slowly. There are about 250 species, or types, of turtle.

Turtles are found in most parts of the world. Most live in freshwater ponds, lakes, or rivers. Others live in the ocean or on land. Some turtles live in forests or even in the desert. Land turtles are often called tortoises. Some water turtles are known as terrapins.



A desert tortoise creeps among wildflowers in the U.S. state of California.

Turtles are all different sizes. The smallest turtles are less than 4 inches (10 centimeters) long. In contrast, the Atlantic leatherback turtle can be more than 7 feet (2 meters) long. It can weigh more than 1,500 pounds (680 kilograms).

Turtles have sturdy legs with short feet and claws on the toes. Sea turtles have flippers instead of front feet. A turtle's shell is made of bone. It is usually very hard and strong. Most turtles can tuck the head, legs, and tail inside the shell for protection from enemies. Snapping turtles cannot do this, but they have a powerful bite for protection.

Turtles eat worms, snails, insects, jellyfish, and shellfish. Many tortoises eat only plants. Turtles can store food in the form of fat. Some turtles can store water, too. They can live for days or even weeks without having anything to eat or drink.

All turtles lay their eggs on land. The female digs a hole and lays her eggs in it. The temperature in the nest usually affects the sex of the baby turtles.

Warmer temperatures generally produce females, while cooler temperatures produce males.

Turtles live longer than most other animals. Some species can live more than 100 years.

► More to explore

Reptile

Tuscarora

The Tuscarora are Native Americans of New York State and Ontario, Canada. In the 1700s they became the sixth tribe to join the group called the Iroquois Confederacy.

The Tuscarora lived in round homes made from poles covered with bark. Later they also lived in homes called longhouses, which were large enough for



A Tuscarora dancer performs at the New York State Fair in Geddes, New York.

several families. The Tuscarora grew corn, gourds, beans, and apples. They also hunted and gathered wild plants.

By the early 1700s British colonists had moved into Tuscarora territory. At that time the Tuscarora lived in North Carolina and Virginia. The settlers mistreated the tribe. They kidnapped Tuscarora men, women, and children and sold them as slaves. They also took the tribe's lands without payment.

The Tuscarora fought back in 1711 by attacking several British settlements. The attacks started a war. At least 1,000 Tuscarora were killed in the fighting. The Tuscarora who survived fled north to New York. There, in 1722, they joined the Iroquois Confederacy.

After the American Revolution (1775–83) many Tuscarora moved to new lands near Lewiston, New York. That area later became the Tuscarora Reservation. Some Tuscarora moved to lands along the Grand River in what is now Ontario. That area is now the Six Nations Reserve. At the end of the 20th century nearly 2,500 Tuscarora lived in the United States. More than 1,900 others lived in Canada.

► More to explore

Iroquois • Native Americans

Tuskegee Airmen

The Tuskegee Airmen were the first group of African Americans to fly warplanes for the U.S. military. They served during World War II. At that time, dur-



A poster from World War II shows an African American airman.

ing the 1940s, African Americans had fewer rights than whites had. The Tuskegee Airmen did their jobs as well as any white pilots. After seeing how well the airmen did, other African Americans pushed harder for equal rights.

Before the United States entered World War II, the National Association for the Advancement of Colored People (NAACP) asked the U.S. government to allow African Americans to fly warplanes. The military was then segregated, or separated by race. Because of this, the U.S. Army started a training program for African Americans only.

The airmen got their training in Alabama at the Tuskegee Army Air Field and at an African American college called Tuskegee Institute. The first Tuskegee Airmen graduated in 1942. Eventually 992 pilots graduated from the training program.

Did You Know?

Most of the Tuscarora were on the side of the colonists during the American Revolution.

The Tuskegee Airmen served in Europe and North Africa. They flew small airplanes that protected bigger airplanes that dropped bombs on enemy targets. The airmen never allowed an enemy airplane to shoot down a U.S. bomber.

In 1948, three years after World War II ended, President Harry S. Truman ended racial segregation in the military. After that African Americans served alongside whites.

► More to explore

African Americans • National Association for the Advancement of Colored People • World War II

Tutankhamen

Tutankhamen was a pharaoh, or king, of ancient Egypt in the 1300s BC. He became pharaoh when he was still a child. He is famous today because of the many treasures found inside his tomb, or grave.

Life

Tutankhamen married while very young. His wife was the daughter of another pharaoh named Akhenaton. Akhenaton had tried to change the religion of ancient Egypt. He wanted Egyptians to have one god only, instead of many gods. Tutankhamen brought back the old religion with its many gods. He died at about age 18.

Tomb and Treasures

Workers dug Tutankhamen's tomb into a hillside in southern Egypt. The place is

called the Valley of the Kings. (By Tutankhamen's time, Egyptians had stopped burying pharaohs in pyramids.)

Thousands of years ago, robbers broke into the tombs of other pharaohs in the Valley of the Kings. They stole many treasures from the tombs. The robbers missed Tutankhamen's tomb because rubble from another tomb covered up the entrance.

In 1922 Howard Carter, a British archaeologist, found Tutankhamen's tomb and opened it. (An archaeologist is a scientist who studies things that people made in the past.) Carter found Tutankhamen's mummy, or preserved body, within a nest of three coffins. The inner coffin was solid gold. A gold mask with the face of the pharaoh covered the mummy's head. The tomb also con-



Tutankhamen's tomb was opened in 1922. One of the most spectacular objects in the tomb was a gold mask. It covered the head of the king's mummy.

tained furniture, statues, clothes, a chariot, weapons, staffs, and various other objects. The government of Egypt now owns these treasures.

► More to explore

Egypt, Ancient • Mummy • Pharaoh

Tutu, Desmond

Desmond Tutu is a religious leader in South Africa. His protests helped to bring an end to South Africa's apartheid laws. Apartheid was a system that kept blacks separate from whites. In 1984 Tutu received the Nobel peace prize for his work.

Early Life

Desmond Mpilo Tutu was born on October 7, 1931, in Klerksdorp, South Africa. His father was a schoolteacher. Tutu graduated from the University of South Africa in 1954.



Desmond Tutu

Tutu taught school for three years. Then he went back to college to study religion. In 1961 he became a priest in the Anglican church. He then taught religion in South Africa and Lesotho (another country in southern Africa).

Career

Between 1972 and 1975 Tutu worked in Great Britain for a Christian group called the World Council of Churches. Then he returned to Africa to serve the Anglican church.

Between 1978 and 1985 Tutu led the South African Council of Churches. During this time he frequently made nonviolent protests against apartheid laws. The apartheid system made life hard for blacks. They did not have the same rights as whites.

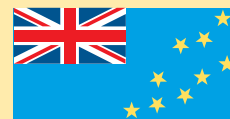
In 1986 Tutu became archbishop of Cape Town, South Africa. This made him the leader of South Africa's 1.6-million-member Anglican church. He was the first black to hold this job. In 1988 Tutu also became chancellor (president) of the University of the Western Cape in Bellville, South Africa. He continued to protest against apartheid.

Apartheid finally ended in the early 1990s. In 1995 Tutu led a committee that investigated the crimes of apartheid. He retired as archbishop in 1996, but he continued to teach.

► More to explore

Apartheid • South Africa

Tuvalu



A traditional hut sits among palm trees on Funafuti Atoll in Tuvalu.

The country of Tuvalu is made up of nine small island groups in the Pacific Ocean. Tuvalu's capital is Vaiaku, on the island group called Funafuti Atoll.

Geography

Tuvalu is in Polynesia, a part of the large region called Oceania. Tuvalu's islands are made of coral. Five of the island groups are atolls. Atolls are groups of islets (small islands) that surround a pool of water. Most of Tuvalu's land is



only about 15 feet (4.5 meters) above sea level. There are no rivers. Tuvalu's climate is hot and rainy.

Plants and Animals

Coconut palms, screw pines, ferns, and grasses grow on the islands. Wildlife includes Polynesian rats, lizards, and turtles. Octopuses, crustaceans, and many fish live in Tuvalu's waters.

People

Almost all the people are Polynesians. Most people speak a language called Tuvaluan. English is also common. Most people are Christians. Nearly half of the population lives on Funafuti Atoll.

Economy

Most people work in agriculture and fishing. Crops include coconuts, tropical fruit, and sweet potatoes. Many people leave the country to find work. Tuvalu's government sells its stamps to stamp collectors around the world. Tuvalu also sells the use of its Internet name, ".tv."

History

The first settlers in Tuvalu came from the islands of Samoa in about the AD 1300s. In 1892 Great Britain took over Tuvalu, which was then called the Ellice Islands. In 1916 Britain joined the Ellice Islands with the Gilbert Islands (now the country of Kiribati). The Ellice Islands gained independence as Tuvalu in 1978.

► More to explore

Coral • Funafuti Atoll • Oceania

Facts About TUVALU



Population
(2008 estimate)
9,600

Area
10 sq mi (26 sq km)

Capital
Vaiaku, on Funafuti Atoll

Form of government
Constitutional monarchy

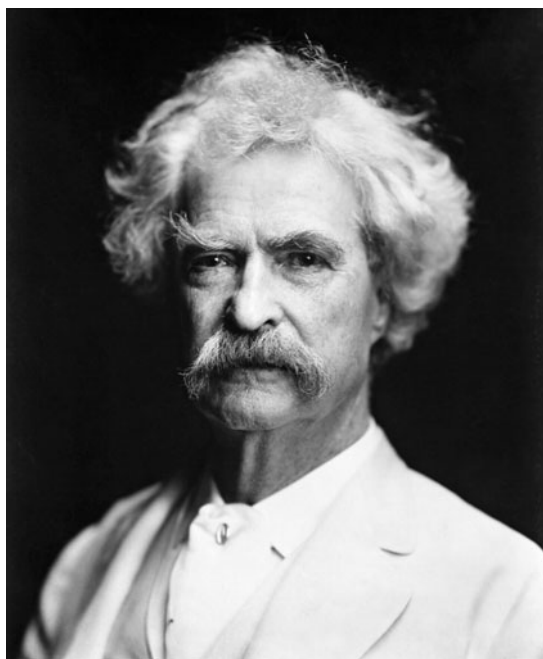
Major town
Fongafale islet

Twain, Mark

The U.S. author Mark Twain wrote stories of youthful adventures. His stories are treasured by readers around the world. He created Tom Sawyer, Huck Finn, and other memorable characters.

Twain's real name was Samuel Langhorne Clemens. Mark Twain was the name he used as a writer. He was born on November 30, 1835, in the small town of Florida, Missouri. When he was 4 years old he moved with his family to Hannibal, Missouri, on the Mississippi River.

In 1847 Samuel's father died. From then on Samuel had to help support the family. At age 13 he started working with a local printer. Later he worked as a printer for newspapers in Saint Louis, Missouri; New York City; and Philadelphia, Pennsylvania. In the late 1850s



Mark Twain

and early 1860s he piloted steamboats on the Mississippi.

Clemens also wrote humorous stories for newspapers. In the 1860s he started writing under the name Mark Twain. In 1865 he published a story called "The Celebrated Jumping Frog of Calaveras County." It made him famous.

In the 1870s Twain settled with his family in Hartford, Connecticut. There he wrote his most famous books. He used his experiences growing up on the Mississippi River to write many of his stories. His novel *The Adventures of Tom Sawyer* (1876) is a story about a boy and his friends in a small river town. *The Adventures of Huckleberry Finn* (1884) tells of a boy's adventures as he floats down the Mississippi on a raft. *Huckleberry Finn* was his best book.

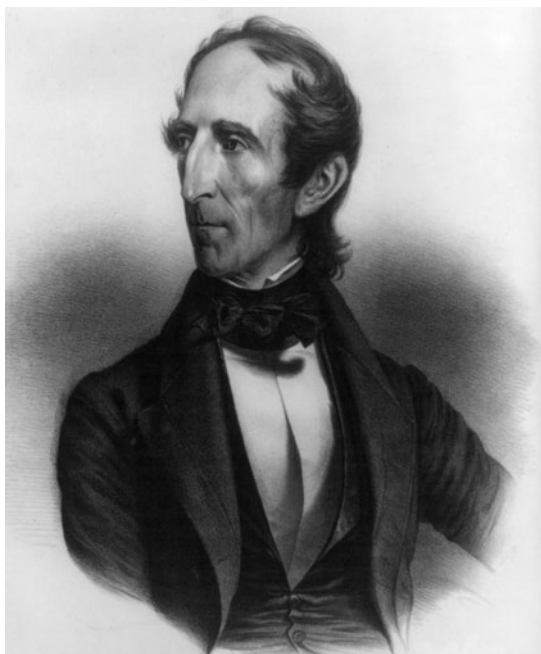
Late in life Twain lived mainly in Europe with his family. He died in Redding, Connecticut, on April 21, 1910.

Tyler, John

The 10th president of the United States, John Tyler did not win a presidential election. He took office after the death of President William Henry Harrison in 1841.

Early Life

John Tyler was born on March 29, 1790, at Greenway, his family's plantation near Richmond, Virginia. He was the son of Mary Armistead and John



John Tyler was the 10th president of the United States.

Tyler, Sr., a judge and former governor of Virginia.

After graduating from the College of William and Mary in 1807, Tyler became a lawyer at age 19. He married Letitia Christian in 1813. The couple had eight children.

Political Career

Tyler entered the Virginia legislature in 1811. In 1816 he was elected to the U.S. House of Representatives. He served again in the Virginia legislature before becoming governor of Virginia in 1825. Two years later he was elected to the U.S. Senate, where he served until 1836.

Although Tyler was a Democrat, he disagreed with Democratic president Andrew Jackson. He and many Southern Democrats joined the Whig Party. In 1840 the Whigs chose Tyler to run for vice president under Harrison. Harrison and Tyler won the election.

Presidency

President Harrison died just one month after taking office. He was the first president to die in office, and the Constitution did not say whether the vice president should become president or just act as president. Tyler decided that he was president.



TIMELINE

Tyler is born near Richmond, Virginia.

March 29, 1790

Tyler is elected vice president under William Henry Harrison.

1840

Tyler leaves office.

1845

Tyler dies in Richmond, Virginia.

January 18, 1862

Tyler becomes governor of Virginia.

1825

Tyler becomes president after Harrison dies.

1841

Tyler wins a seat in the Confederate Congress.

1861



Did You Know?

Tyler's enemies called him "His Accidency." They did not want anyone to forget that he had become president "by accident."

Neither the Whigs nor the Democrats supported Tyler. Still, he led Congress to reorganize the Navy and to establish the Weather Bureau. He ended an expensive war against the Seminole people in Florida. He also helped to stop a rebellion against the state government of Rhode Island in 1842. Finally, Tyler got Congress to agree to take over the Republic of Texas.

Tyler's wife died in 1842. In 1844 Tyler married Julia Gardiner. They had seven children.

Later Years

For the presidential election of 1844 Tyler created his own political party, but he soon dropped out of the race. He left office in 1845.

Tyler was a slave owner, but before the American Civil War (1861–65) he wanted to keep the Union together. When the war began, however, he supported the South and was elected to the Confederate House of Representatives. Before taking office, he died in Richmond on January 18, 1862.

► More to explore

Confederate States of America
• Harrison, William Henry • Jackson, Andrew • United States

Typhoid Fever

Typhoid fever is a serious disease. It is rare in wealthy countries but common in poor ones. People with the disease usually have a high fever for many days. Other symptoms, or signs, of typhoid

fever include headache, stomach pain, and weakness. A rash of rosy spots also may appear on the body.

Tiny living things called bacteria cause typhoid fever. The type of bacteria that causes the disease lives only in humans. It travels in the blood and attacks the intestines. It passes from person to person through water or food.

Typhoid fever may be prevented by keeping water supplies clean. Washing the hands before preparing food is important, too. People also may get a typhoid fever vaccine (a substance that prevents the disease) from a doctor or a nurse. People who do get the disease need to be treated with drugs called antibiotics. People who are not treated may die.

In the early 1900s a cook called Mary Mallon spread typhoid fever to at least 51 people in the United States. She carried the bacteria but did not get the disease. She passed the bacteria to people through food that she prepared. Mallon's actions earned her the nickname Typhoid Mary.

► More to explore

Bacteria • Disease, Human

Typhus

Typhus is the name of several diseases caused by tiny living things called bacteria. The symptoms of typhus include headache, fever, and rash. Lice, fleas, mites, and ticks carry the types of bacteria that cause typhus. These bloodsuckers pass the bacteria to humans.

To prevent typhus, people should keep lice, fleas, mites, and ticks from getting on their skin. People also can get a vaccine, or substance that prevents the disease. If a person does get typhus, drugs called antibiotics can cure it.

► More to explore

Disease, Human

Tyrannosaurus Rex

Tyrannosaurus rex, or *T. rex*, was one of the largest and most ferocious predators ever to walk on Earth. The name *Tyrannosaurus rex* means “king of the tyrant lizards.” *T. rex* was just one of the group of dinosaurs called tyrannosaurs. The tyrannosaurs were theropods, or meat-eating dinosaurs that walked on their two back legs.

When and Where

Tyrannosaurus rex Lived

T. rex lived about 80 to 65 million years ago. Fossil remains of *T. rex* have been found in the United States, Canada, and

Asia. Scientists believe that *T. rex* lived in forests and in forest clearings.

Physical Features

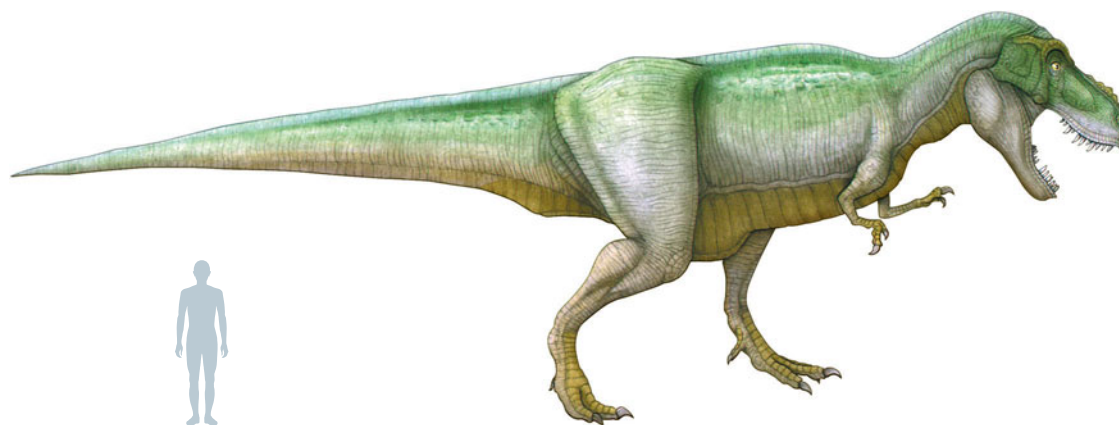
T. rex could reach a length of 42 feet (13 meters) and weighed up to 8 tons. Its huge head could reach 5 feet (1.5 meters) in length, and its skull alone weighed up to 600 pounds (270 kilograms). Its eyes allowed it to see forward and to the sides. *T. rex* had about 60 teeth with sawlike edges. It had muscular back legs, each with three clawed toes. *T. rex*'s front legs were tiny but very strong. Its tail was held off the ground.

Behavior

T. rex preyed on plant-eating dinosaurs. It most likely lunged out from behind trees in surprise attacks. It also may have hunted in packs to bring down much larger dinosaurs. Scientists estimate that *T. rex* could run 20 miles per hour (32 kilometers per hour) for short distances. *T. rex* also may have been a scavenger, feeding upon dead animals.

► More to explore

Dinosaur



Tyrannosaurus rex

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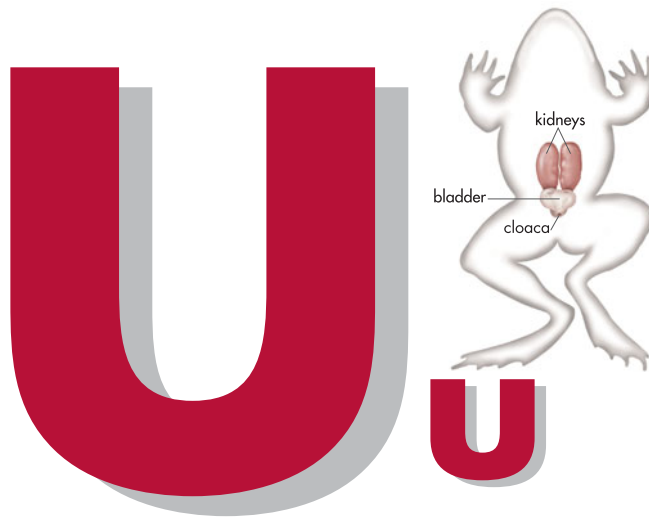
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The average year-round temperature of Ulaanbaatar, the capital of Mongolia, is only 27° F (–3° C).

(See Ulaanbaatar.)

The Underground Railroad was a secret organization that helped escaped slaves from the Southern United States reach places of safety in the North or in Canada.

(See Underground Railroad.)

The main goal of the United Nations, an organization of almost all the world's countries, is world peace.

(See United Nations.)

The Milky Way galaxy contains more than 100 billion stars.

(See Universe.)

The urine of birds and reptiles is white and thick. The urine of land insects is solid.

(See Urinary System.)



Uganda

Uganda is a country in East Africa. It takes its name from Buganda, which was a powerful African kingdom in the 1800s. Uganda's capital is Kampala.

Geography

Uganda shares borders with Sudan, Kenya, Tanzania, Rwanda, and the Democratic Republic of the Congo. Lake Victoria lies to the southeast. It is the world's second largest freshwater lake, after Lake Superior in North America.

Most of Uganda is on a plateau, or raised flat area. A huge natural ditch called the Western Rift Valley runs along the country's western border. Mountains rise in the west, north, and east. Uganda's rivers include the Victoria Nile and the Albert Nile. Uganda has a warm climate with rainy and dry seasons.



Mgahinga Gorilla National Park in southwestern Uganda is home to rare mountain gorillas.

Plants and Animals

Scattered tropical rain forests grow in southern Uganda. In the north tall grasses and clumps of trees cover the land.

Hippopotamuses and crocodiles live in most of Uganda's lakes. The country's wildlife also includes chimpanzees, elephants, lions, leopards, rhinoceroses, giraffes, and zebras. Rare mountain gorillas live in a national park in the southwest.

People

Dozens of different African peoples live in Uganda. Those who speak Bantu languages make up the largest part of the population. The Ganda people form the largest single group. Small numbers of



Asians, Europeans, and Arabs also live in Uganda.

Uganda's peoples speak more than 30 languages. English, Ganda (or Luganda), and Swahili are the most common languages. About two thirds of the people are Christians. Many other Ugandans practice Islam or traditional African religions. Most people live in rural areas.

Economy

Most of Uganda's people are farmers. The main crops include coffee, tea, cotton, and tobacco. People grow sweet potatoes, corn, peanuts, and beans for food. Farmers also raise cattle, sheep, goats, pigs, chickens, ducks, and turkeys. Fishing is another important source of food.

Industry is a small part of Uganda's economy. Many industries process farm products, including coffee, tea, tobacco, sugar, and cooking oils. Uganda also produces beer, soft drinks, cement,



Several houses stand on a hillside in a mountainous area of Uganda. Most of the country's people have homes in rural areas.

metal products, shoes, soap, and fabrics. The country's mines provide copper, cobalt, gold, and other minerals.

History

Small groups of farmers and herders moved into the Uganda region hundreds of years ago. West of Lake Victoria, the Bunyoro kingdom gained power at the end of the 1400s. By the 1800s, however, the Buganda kingdom had become the largest power in the region.

Arab traders reached the area in the 1840s. The first European explorers came to Buganda in 1862. Missionaries soon followed and began to teach Christianity. Great Britain took over Buganda in the 1890s.

In 1962 the region gained independence as the Republic of Uganda. In 1971 a military officer named Idi Amin seized control of the government. He ruled the country as a dictator, or a leader with unlimited power. The military government killed as many as 300,000 Ugandans during Amin's rule.

In 1979 Amin was forced to leave the country after making an unsuccessful attack on Tanzania. Uganda elected a president in 1980, but the military took control again in 1985. In 1986 a rebel leader named Yoweri Museveni became president. Other rebels tried to bring down his government, but he remained in power into the 21st century.

► More to explore

Kampala

Facts About UGANDA



Population
(2008 estimate)
29,166,000

Area
93,065 sq mi
(241,038 sq km)

Capital
Kampala

Form of government
Republic

Major cities
Kampala, Gulu,
Lira, Jinja, Mbale



Ukraine

Ukraine is the second largest country in Europe, after Russia. Ukraine's capital is Kiev.

Geography

Ukraine shares borders with Moldova, Romania, Hungary, Slovakia, Poland, Belarus, and Russia. The Black Sea and the Sea of Azov lie to the south.

Almost all of Ukraine is flat. The grassland that covers the central and southern parts of the country is called the steppe. In northern Ukraine are the Pripet Marshes, the largest swamp in Europe. The Carpathian Mountains rise in the west. The Crimean Mountains cross the Crimean Peninsula, a piece of land that extends south into the Black Sea. Ukraine's longest river is the Dnieper.

Most of Ukraine has warm summers and cold winters. It rains mainly in June and July.



Cliffs on the Crimean Peninsula overlook the Black Sea. The peninsula is the most southern part of Ukraine.

Plants and Animals

Most of Ukraine's forests are in the mountains in the west. Some trees grow among the swamplands and in central Ukraine. The southern grassland has few trees. The country's animals include deer, wolves, bears, foxes, wildcats, beavers, weasels, and badgers.

People

Most of Ukraine's people are ethnic Ukrainians, but Russians form an important minority group. There are also small groups of Moldovans, Tatars, and Belarusians. Ukrainian is the main language. Most people live in cities or towns.

About half the people of Ukraine follow some form of Eastern Orthodox Christianity. Others are Ukrainian Catholics, Roman Catholics, Protestants, or Muslims. About one Ukrainian in six does not follow any religion.

Economy

Manufacturing and mining are both important to Ukraine's economy. Factories produce iron and steel, locomotives, tractors, chemicals, and other goods. Mines provide manganese, coal, iron ore, salt, sulfur, and other minerals. Ukraine also has reserves of natural gas and oil.

Farming is important to the economy, too. The main crops are potatoes, sugar beets, wheat, barley, corn, rye, and oats. Farmers also raise cattle, pigs, sheep, and goats.

History

Tribes of people called Slavs arrived in what is now Ukraine during the 400s and 500s. Viking invaders called Varangians later mixed with the Slavs. They set up a state that became the powerful kingdom of Kievan Rus. Kievan Rus lost power when Mongols invaded in the 1200s.

Poles and Cossacks

In the 1300s Lithuania took control of most of Ukraine. Poland ruled most of Ukraine after 1569. The Poles made many Ukrainians into serfs, or farmers who had to work on land that they did not own.

Some serfs escaped and joined a military force called the Cossacks. In 1648 the Cossacks led a fight against Polish rule. The Cossacks asked Russia to help them defeat the Poles. The Cossacks won independence from Poland, but their new state soon became part of the Russian Empire.



Folk dancers in traditional dress perform on a street in Ukraine.

Soviet Control

In the 1700s Russia slowly gained control over almost all of Ukraine. By 1922 Ukraine had become part of the newly formed Soviet Union. The Soviets took over Ukraine's farms. During the 1930s about 5 to 7 million Ukrainians died from starvation.

During World War II Germany invaded Ukraine. German forces made millions of Ukrainians into slaves and murdered about 600,000 Ukrainian Jews. The Soviets drove the Germans out of Ukraine in 1944.

Independence

In 1991 the Soviet Union broke apart, and Ukraine declared its independence. In 2004 many Ukrainians protested when Viktor Yushchenko lost the presidential election. They thought the election had been unfair. Ukraine then held a second election, and Yushchenko won.

► More to explore

Crimea • Kiev • Union of Soviet Socialist Republics

Facts About UKRAINE



Population
(2008 estimate)
46,222,000

Area
233,062 sq mi
(603,628 sq km)

Capital
Kiev

Form of government
Republic

Major cities
Kiev, Kharkiv,
Dnipropetrovsk,
Odessa, Donetsk

Ulaanbaatar



Population
(2008 census)
1,031,200

Ulaanbaatar is the capital of Mongolia, a country in central Asia. It is the largest city in Mongolia by far. It lies on the Tuul River. Ulaanbaatar is one of the world's coldest capitals. Its average year-round temperature is only 27° F (−3° C).

Ulaanbaatar is one of Mongolia's industrial centers. Factories in the city make food products, fabrics, carpets, leather goods, and a luxury fiber called cashmere. Many people in Ulaanbaatar work

for the government or in trade or other service industries.

Buddhists built a religious center called the Da Khure monastery in what is now Ulaanbaatar in 1639. Over time a city grew around the monastery. It became a trade center on a route between China and Russia.

China controlled Mongolia for hundreds of years. In 1911 Mongolia became an independent country. Ulaanbaatar was made its capital in 1924. The city grew rapidly during the 1900s.

► **More to explore**
Mongolia

Ulster

Ulster was an ancient kingdom of Ireland. It covered the northern part of the island of Ireland. The name Ulster is now commonly used for Northern Ireland, a part of the United Kingdom.

Ulster was one of five Irish kingdoms created about 2,000 years ago by people called the Celts. In its early history, it was the most powerful of the kingdoms. It was ruled by Roman Catholic kings.

England took control of Ireland in the 1100s. In the late 1500s Ulster rebelled against England, but it was defeated. The English king then sent Protestant settlers from Scotland and England to Ulster. Ulster changed from Catholic to mostly Protestant. The religious differences led to fighting.



Elderly people gather outside a Buddhist religious center in Ulaanbaatar, Mongolia.

In the early 1900s southern Ireland moved toward independence from Great Britain. The Protestants of Ulster wanted to remain part of Britain. In 1920 Britain divided the island. Six of Ulster's nine counties remained under British rule. They became Northern Ireland. The other three counties joined the new country of Ireland.

► More to explore

Celt • Ireland • Northern Ireland

Underground Railroad

The Underground Railroad was not an actual railway. Instead, it was a secret organization that existed in the United States before the Civil War. The people of the Underground Railroad helped escaped slaves from the South to reach places of safety in the North or in Canada.

The Underground Railroad used railway terms as code words. The routes to freedom were called “lines.” The hiding places on the lines were called “stations.” The people who moved or hid the slaves were called “conductors.” The slaves themselves were sometimes called “freight.”

The Underground Railroad had to be secret because it was against the law. Laws called the Fugitive Slave acts protected slaveholders' rights even in states that did not allow slavery. The people who ran the Underground Railroad were



A painting shows how the Underground Railroad in the United States moved enslaved Africans to freedom in the dark of night.

abolitionists—they wanted to abolish, or end, slavery in all states.

Many Underground Railroad conductors were followers of the Quaker religion. The Quaker leader Thomas Garrett is believed to have helped about 2,700 slaves escape. Other conductors were Northern blacks. Harriet Tubman, a former slave, led hundreds of slaves to freedom.

The heaviest activities of the Underground Railroad were in Pennsylvania, Ohio, Indiana, New York, and the New England states. Most routes ended in Canada. Estimates of the number of slaves who “rode” the Underground Railroad range from 40,000 to 100,000. The Railroad's activities ended with the beginning of the Civil War in 1861.

► More to explore

Abolitionist Movement • Fugitive Slave Acts • Quaker • Slavery • Tubman, Harriet

Unicorn

► see Animals, Legendary.

Unidentified Flying Object (UFO)

An unidentified flying object, or UFO, is anything in the sky that cannot be explained by the person who sees it. Some people think that UFOs are alien spaceships. But most scientists say that UFOs can be explained in much more ordinary ways.

Descriptions of UFOs have ranged from glowing wheels to colored balls of light to cigar-, crescent-, or disk-shaped objects. A sighting of disk-shaped UFOs in the 1940s led to the creation of the term flying saucers. It then became popular to call all UFOs flying saucers.



Clouds can often form strange shapes. Some people may see such a cloud and think that it looks like a flying saucer.

The U.S. government has kept records of thousands of UFO sightings. These records include photos of UFOs and recordings of interviews with people who claim to have seen them. In the 1950s scientists chosen by the government studied hundreds of sightings. Most of the sightings turned out to be space objects, such as stars, bright planets, or meteors. Many other sightings were aircraft, birds, or hot gases. Often these sightings happened in unusual weather conditions.

The scientists' findings did not stop UFO reports, however. By the mid-1960s UFO sightings were more numerous than ever. The U.S. government continued to say that UFOs were not evidence of alien life. Most scientists agreed. But some UFO sightings remained unexplained. Even today a few scientists believe that some UFOs could be visitors from outer space.

Union of Soviet Socialist Republics

The Union of Soviet Socialist Republics (U.S.S.R.), or Soviet Union, was the first country to form a government and an economy based on the system known as Communism. The Soviet Union was in existence for only about 70 years, from 1922 to 1991. For much of that time, however, it was one of the most powerful countries in the world.



The Russian republic was by far the largest of the 15 republics that made up the Soviet Union.

Land

The Soviet Union was the largest country that ever existed. It covered more than 8.6 million square miles (22.3 million square kilometers) in Europe and Asia—almost two and one half times the area of the United States.

The Soviet Union was made up of 15 states. The states were called republics. The largest and most powerful republic was the Russian Soviet Federated Socialist Republic, which is now called Russia. The modern names for the other republics are Estonia, Latvia, Lithuania, Belarus, Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan, and Kyrgyzstan. The capital of the Soviet Union was Moscow, which was also the capital of Russia.

People

In its last years, the Soviet Union had the world's third-largest population—more than 290 million people. The country had more than 100 groups of different peoples. Ethnic Russians made up the largest group by far. The next-largest groups were Ukrainians, Uzbeks, Belarusians, and Kazakhs. Russian was the official language, but more than 200 other languages existed in the country.

The Soviet government did not approve of religion. Even so, the Russian Orthodox Christian church survived. There were also many Muslims, or followers of Islam, in some republics.

During the time the Soviet Union existed, millions of people moved from farms to cities. By 1991, two out of

every three Soviet citizens lived in a city. Moscow, Leningrad (now Saint Petersburg), and Kiev (now in Ukraine) were the largest cities.

Culture

The government of the Soviet Union controlled all parts of life in the country. The people were not allowed to speak openly to oppose the government. During the late 1920s and 1930s the government even put a stop to free artistic expression. Artists and writers were allowed to say only good things about the Soviet system. The government put many artists and writers in prison. Others left the country.

A few Soviet writers still produced great work. Boris Pasternak won the Nobel prize for literature in 1958, and Aleksandr Solzhenitsyn won it in 1970. Pasternak had to refuse the award, and Solzhenitsyn was forced to leave the country.



The Soviet government built plain high-rise apartment buildings in Moscow and other big cities. The buildings were needed to house the many people who moved to the cities from farms.



"For the Defense of the U.S.S.R." is the message of a 1929 poster. It shows factories, warplanes, and soldiers on the march.

Economy

During its most powerful period, the Soviet Union had one of the world's strongest economies. Agriculture, mining, and heavy industry all made big contributions to national wealth. The government completed many large projects such as dams and canals.

According to Communist teachings, individuals should not be allowed to own businesses. So the government owned almost all businesses and factories in the Soviet Union. Communist Party leaders decided what kinds of products would be made and how much the people would pay for them. The system led to shortages of many of the products that people needed.

The Communist system was also supposed to give farmers and workers a fair share of the country's wealth. However, farmers suffered greatly when the gov-

ernment took their land and created large farms called collective farms. By the 1970s the Soviet Union had to buy food from other countries to feed its people.

History

The Soviet Union was originally the Russian Empire. The tsar, or emperor, fell from power in a revolution that took place in 1917. Later in the same year a group called the Bolsheviks came to power. This group, later renamed the Communist Party, fought other Russians in a civil war that lasted from 1918 to 1920. Vladimir Lenin led the Communists. The Communists won the war.

Early Years

On December 20, 1922, the Communists created the Union of Soviet Socialist Republics. Russia was one of its republics. The other republics were mostly regions of the former Russian Empire. They were home to various non-Russian groups.

Lenin died in 1924. A few years later, a Communist Party leader named Joseph Stalin came to power. Stalin was one of the cruelest rulers who ever lived. He killed farmers who did not want collective farms. He sold crops to foreign countries and let his own people starve. During the 1930s he caused as many as 10 million people in the Soviet Union to die.

World War II

In 1939, just before World War II began, Germany and the Soviet Union secretly agreed not to attack each other.

Germany then invaded Poland, which started the war. Germany and the Soviet Union divided Poland between them. The Soviet Union also took Latvia, Lithuania, and Estonia at this time and made them Soviet republics.

In June 1941, however, Germany broke the agreement and invaded the Soviet Union. The Soviet Union then joined the United States and Great Britain to fight Germany.

The Soviet Union suffered terribly during the war. By the time Germany surrendered in 1945 more than 20 million Soviet people had died.

Cold War

Despite all the damage it had suffered, the Soviet Union was still the greatest power in Europe after World War II. While fighting the Germans, Soviet troops moved into many countries in eastern Europe. Between 1945 and 1948 the Soviets set up Communist governments in these countries. They con-



The Communist Party leader Vladimir Lenin speaks to an outdoor gathering in 1920.



Each May Day (May 1) the Soviet government paraded missiles and other military weapons through Red Square in central Moscow.

trolled these governments. This activity worried many people in other countries, particularly the United States. Both countries built up their military forces. The rivalry between them came to be known as the Cold War.

The United States and the Soviet Union both developed nuclear weapons. Many people were afraid that this would lead to nuclear war. But neither country ever used the weapons.

Conditions improved for the Soviet people following Stalin's death in 1953. Over the next few years Nikita Khrushchev came to power. Khrushchev introduced some reforms that angered other Communist party leaders. In 1964 he lost power.

Some eastern European countries tried to take advantage of the reforms. They rose up against Soviet rule. To stop the uprisings, the Soviet Union invaded Hungary in 1956 and Czechoslovakia in 1968.

The Soviets invaded Afghanistan in 1979. Afghanistan is an Asian country that bordered the Soviet Union. Rebels there were trying to overthrow a Communist government. The United States supported the rebels. In 1989 the Soviet Union left Afghanistan in defeat.

Breakup

In 1985 Mikhail Gorbachev came to power. Gorbachev wanted to build a stronger economy and a freer society. His policies were called *glasnost*, which means "openness," and *perestroika*, which means "restructuring." But Gorbachev soon learned that the more freedom his people had, the more they wanted. Beginning in 1987 people in some of the Soviet republics began to demand independence.

In 1989 a series of almost completely peaceful revolutions began. The eastern European countries gained independence from Soviet control. During 1991 the Soviet republics also gained their independence. On the last day of that year, the Soviet Union came to an end. Fifteen separate countries replaced it.

► More to explore

Cold War • Communism • Lenin, Vladimir Ilich • Moscow • Russia
• Russian Revolution • Stalin, Joseph

United Arab Emirates



Boys get ready for a camel race in the United Arab Emirates.

The United Arab Emirates is a small, rich country in the Middle East. The capital is Abu Dhabi.

Geography

The country is a union of seven small kingdoms, or emirates. The emirate called Abu Dhabi takes up most of the country's land. It stretches along the Persian Gulf, to the north. The other six emirates are in the northeast. The coun-



try shares borders with Saudi Arabia and Oman. Most of the land is a flat desert.

Plants and Animals

Few plants grow in the desert. Date palm, mango, and guava trees grow near the coast. Snakes, lizards, foxes, hares, and gerbils live in the country.

People

Less than a quarter of the people in the United Arab Emirates are citizens. Most people are workers from other countries. Arabs make up about half of the population. South Asians form the next largest group. Most people are Muslims. Arabic is the main language.

Economy

The United Arab Emirates' economy depends on the sale of oil and natural gas. The country also produces chemicals, clothing, cement, metals, food products, and minerals.

History

For hundreds of years the region was divided among many tribes and kingdoms. In the 1800s the main tribal rulers signed peace agreements, or truces, with Great Britain. The region then became known as the Trucial States. The British left the region in 1971. Six emirates then joined together to form the United Arab Emirates. In 1972 a seventh emirate joined the country.

► More to explore

Abu Dhabi • Arabs • Middle East

Facts About UNITED ARAB EMIRATES



Population
(2008 estimate)
4,660,000

Area
32,280 sq mi
(83,600 sq km)

Capital
Abu Dhabi

Form of government
Federation of seven emirates

Major cities
Dubayy, Abu Dhabi, Ash-Shariqah, Al-'Ayn, 'Ajman



United Kingdom

The United Kingdom is a country of western Europe. It is made up of four parts: England, Scotland, Wales, and Northern Ireland. The country's full name is the United Kingdom of Great Britain and Northern Ireland. Sometimes the country is called Great Britain, or just Britain. The capital of the United Kingdom is London, in southeastern England.

Geography

The United Kingdom is an island country in the Atlantic Ocean. It lies off the northwestern coast of mainland



The United Kingdom has quiet villages, but most of its people live in large cities.



Europe. The country has land on two main islands. The island of Great Britain contains England, Scotland, and Wales. England covers most of the southern two thirds of Great Britain. Scotland takes up the northern third. Wales lies on the southwestern part of Great Britain.

The island of Ireland is west of Great Britain. Northern Ireland is in the northeastern part of this island. The country called Ireland takes up the rest of the island. It is not part of the United Kingdom.

Plants and Animals

The United Kingdom has forests in northeastern Scotland and southeastern England. Common trees include oak, elm, ash, beech, pine, and birch. Some parts of Scotland and Northern Ireland have large areas of peat moss and heather.

Deer, badgers, otters, foxes, and weasels live in rural areas. Rabbits, rodents, hedgehogs, moles, and shrews are common. Birds include sparrows, blackbirds, chaffinches, and starlings.

People

The people of the United Kingdom are called the British. Most of them are descendants of early settlers from mainland Europe. More than four fifths of the people live in England. The population also includes people from places that the United Kingdom once ruled as colonies. Many of these people have roots in India, Pakistan, Bangladesh, the West Indies, and Africa.

English is the most common language in the United Kingdom. Some people speak Welsh, Scottish Gaelic, or Irish Gaelic.

About two thirds of the people are Christian. Of these, most belong to Protestant churches. The United King-



The Scottish Exhibition and Conference Centre in Glasgow, Scotland, attracts visitors from all over the United Kingdom. It hosts business meetings and public events, including concerts and dance performances.

dom also has groups of Muslims, Hindus, Sikhs, and Jews.

Economy

International trade, finance, and insurance are important to the United Kingdom’s economy. The country



TIMELINE

Celts settle in Great Britain and Ireland.

before 300 BC

Wales is united with England.

1536

Ireland is added, forming the United Kingdom.

1801

Wales, Scotland, and Northern Ireland get parliaments.

1999

The first united English kingdom is established.

AD 927

Scotland is united with England and Wales.

1707

Most of Ireland splits from the United Kingdom.

1921



Guards march in front of Buckingham Palace, the London home of the king or queen of the United Kingdom. The country is a constitutional monarchy. This means that though there is a king or queen, the real power to rule the country rests with members of the Parliament, who are elected by the people.

Facts About UNITED KINGDOM



Population
(2008 estimate)
61,446,000

Area
93,635 sq mi
(242,514 sq km)

Capital
London

**Form of
government**
Constitutional
monarchy

Major cities
London,
Manchester, Bir-
mingham, Leeds,
Newcastle

exports, or sells to other countries, electrical equipment, automobiles, aircraft, petroleum (oil), and iron and steel products. The United Kingdom also has important paper, printing, and publishing industries. The main crops include barley, wheat, sugar beets, and potatoes. Farmers also raise cattle, sheep, and pigs.

History

The United Kingdom was invaded many times in its early history. By about 300 BC people called Celts had arrived on the islands of Great Britain and Ireland. They came from mainland Europe. The Romans came in the 1st century BC. England and Wales were part of the Roman Empire until the AD 400s. Then peoples called Angles, Saxons, and Jutes invaded from

northern Germany. They settled throughout England. Eventually all the people of England came to be known as Anglo-Saxons.

In the 700s and 800s Vikings from northern Europe raided the coasts of England. In the late 800s the Anglo-Saxons defeated the Vikings. Then, in the 900s, the Anglo-Saxons established a united English kingdom for the first time.

Growth of the Kingdom

The English kingdom grew through conquests over hundreds of years. In the late 1200s the king of England seized Wales. Before that, Wales had been a collection of Celtic kingdoms. In 1536 the English Parliament, a group of lawmakers, officially united Wales with England.



The ruins of a Roman Catholic abbey stand in a field in northern England. King Henry VIII broke away from the Roman Catholic church in the 1500s. He ordered Catholic monks to leave the monasteries where they lived and worked. He also founded a new Protestant church called the Church of England. Today most people in the United Kingdom are Protestant.

Kings and Queens of England		
Name	Nationality or Family	Years of Reign
Athelstan	Saxon	925–939
Edmund I	Saxon	939–946
Eadred	Saxon	946–955
Eadwig	Saxon	955–959
Edgar	Saxon	959–975
Edward the Martyr	Saxon	975–978
Ethelred II the Unready	Saxon	978–1013
Sweyn Forkbeard	Danish	1013–14
Ethelred II the Unready	Saxon	1014–16
Edmund II Ironside	Saxon	1016
Canute	Danish	1016–35
Harold I Harefoot	Danish	1035–40
Hardecanute	Danish	1040–42
Edward the Confessor	Saxon	1042–66
Harold II	Saxon	1066
William I the Conqueror	Norman	1066–87
William II	Norman	1087–1100
Henry I	Norman	1100–35
Stephen	Blois	1135–54
Henry II	Plantagenet	1154–89
Richard I	Plantagenet	1189–99
John	Plantagenet	1199–1216
Henry III	Plantagenet	1216–72
Edward I	Plantagenet	1272–1307
Edward II	Plantagenet	1307–27
Edward III	Plantagenet	1327–77
Richard II	Plantagenet	1377–99
Henry IV	Plantagenet: Lancaster	1399–1413
Henry V	Plantagenet: Lancaster	1413–22
Henry VI	Plantagenet: Lancaster	1422–61
Edward IV	Plantagenet: York	1461–70
Henry VI	Plantagenet: Lancaster	1470–71
Edward IV	Plantagenet: York	1471–83
Edward V	Plantagenet: York	1483
Richard III	Plantagenet: York	1483–85
Henry VII	Tudor	1485–1509
Henry VIII	Tudor	1509–47
Edward VI	Tudor	1547–53
Mary I	Tudor	1553–58
Elizabeth I	Tudor	1558–1603

Scotland fought many battles against England to keep its independence. In 1603 Scotland and England were united

under one king, but Scotland kept its own, separate parliament. Then, in 1707, the parliaments of Scotland and

Kings and Queens of England and Scotland		
Name	Family	Years of Reign
James I	Stuart	1603–25
Charles I	Stuart	1625–49

Commonwealth (No King or Queen)	
Name	Years of Rule
Oliver Cromwell, Lord Protector	1653–58
Richard Cromwell, Lord Protector	1658–59

Kings and Queens of England and Scotland		
Name	Family	Years of Reign
Charles II	Stuart	1660–85
James II	Stuart	1685–88
William III and Mary II	Orange/Stuart	1689–94
William III	Orange	1694–1702

Kings and Queens of Great Britain (England and Scotland)		
Name	Family	Years of Reign
Anne	Stuart	1702–14 (Kingdom of Great Britain was formed in 1707)
George I	Hanover	1714–27
George II	Hanover	1727–60

Kings and Queens of the United Kingdom		
Name	Family	Years of Reign
George III	Hanover	1760–1820 (United Kingdom was formed in 1801)
George IV	Hanover	1820–30
William IV	Hanover	1830–37
Victoria	Hanover	1837–1901
Edward VII	Saxe-Coburg-Gotha	1901–10
George V	Windsor	1910–36
Edward VIII	Windsor	1936
George VI	Windsor	1936–52
Elizabeth II	Windsor	1952–

England were joined. The newly united country, which consisted of England, Scotland, and Wales, was called the kingdom of Great Britain. The people of the kingdom were called the British.

England conquered much of Ireland in the late 1100s. The people of Ireland, like the people of Scotland, resisted English rule. But by the end of the 1600s England had firm control of the

island. Ireland was officially joined to England, Scotland, and Wales in 1801. It was called the United Kingdom of Great Britain and Ireland.

The British Empire

Many years earlier England had begun to establish settlements called colonies in other parts of the world. People from England started settling in North America and Asia in the 1600s. Later others settled in Africa and other places. All the colonies and lands that were ruled by England came to be known as the British Empire.

Great Britain lost its American colonies as a result of the American Revolution (1775–83). But the United Kingdom still became one of the richest and most powerful countries in the world. During the reign of Queen Victoria (1837–1901) the British Empire included more than one fourth of the world's people.

Conflict in Ireland

Many Irish people did not want Ireland to be part of the United Kingdom. One concern was that most Irish people were Roman Catholic while most English were Protestant. The English government established anti-Catholic laws in both Britain and Ireland. For example, Catholics were not allowed to hold public office for many years.

After years of fighting, most of Ireland's counties split from the United Kingdom in 1921. They formed the Irish Free State (now Ireland). But six northern counties remained part of the United Kingdom as Northern Ireland. The

country was renamed the United Kingdom of Great Britain and Northern Ireland. Some people in Northern Ireland continued to fight against British rule through the 20th century.

Later Years

The United Kingdom was on the winning side in both World War I (1914–18) and World War II (1939–45). After World War I Britain won new lands from the defeated countries as the result of peace treaties. Prime Minister Winston Churchill gave Britain strong leadership during World War II. But British cities were heavily damaged. The United Kingdom spent years rebuilding its economy.

After World War II Britain gave up most of its lands in other parts of the world. Almost all the former colonies, however, chose to maintain ties with Britain. They remained members of a British organization called the Commonwealth.

For many years the people of Wales, Scotland, and Northern Ireland asked for more self-rule. During the 1990s the British government finally allowed the three to form their own parliaments. The national Parliament in London, however, continued to govern the United Kingdom as a whole.

► More to explore

Anglo-Saxon • Celt • Empire • England • Europe • London • Northern Ireland • Parliament • Rome, Ancient • Scotland • Vikings • Wales • World War I • World War II

United Nations

The United Nations is an organization that includes almost all the world's countries, or nations. It is called the UN for short. By the 21st century the United Nations had more than 190 members. The main goal of the United Nations is world peace. The United Nations also works to reduce poverty and suffering and to improve people's lives in other ways.

Functions

The United Nations tries to find peaceful solutions to disagreements between countries. If fighting breaks out, the United Nations sometimes sends in military troops to try to stop it.

After a war, UN organizations provide money to help countries rebuild. They also give poor countries money to help build up their economies.

The United Nations helps refugees—people who have left their countries to avoid danger or mistreatment. The United Nations also tries to protect



United Nations troops patrol an area in order to help keep the peace.

human rights. The United Nations Universal Declaration of Human Rights, written in 1948, describes those rights. The United Nations also tries to make sure that everyone gets equal treatment regardless of race, sex, language, or religion.

Divisions

The United Nations has six main parts. They are the General Assembly, the Security Council, the International Court of Justice, the Secretariat, the Economic and Social Council, and the Trusteeship Council. The Trusteeship Council is no longer active.

The General Assembly discusses all kinds of issues that affect member countries. It has representatives from UN members. Each member has one vote. To decide important questions, at least two thirds of the members must agree.

The Security Council looks into disagreements between countries and suggests ways to settle them peacefully. Only 15 countries belong to the Security Council at any one time. Five countries belong permanently. They are the United States, Great Britain, France, Russia, and China. All five permanent members must agree before the Security Council can take action.

The International Court of Justice hears disputes between countries. It is commonly called the World Court. Any member country can bring a case before the court, which has 15 judges.

Some United Nations Agencies and Programs		
Specialized Agencies	Abbreviation	Goals
International Labour Organization	ILO	To improve working conditions for workers worldwide
Food and Agriculture Organization of the UN	FAO	To improve farming, forestry, and fishing practices; to ensure that all people have enough to eat
UN Educational, Scientific and Cultural Organization	UNESCO	To promote education for all; to protect nature and the world's cultures; to promote international cooperation in science; to ensure freedom of speech
World Health Organization	WHO	To ensure all people are as healthy as possible
World Bank Group		To give loans and technical help to developing countries
Other Programs and Funds		
United Nations Environment Programme	UNEP	To help countries protect the environment
United Nations Children's Fund	UNICEF	To help children worldwide be safe, healthy, and educated
Office of the United Nations High Commissioner for Refugees	UNHCR	To protect refugees (people who were forced to leave their country)
World Food Programme	WFP	To get emergency food supplies to people who need them
Source: United Nations		

The Secretariat helps to carry out UN decisions. People from almost every member country work in its offices. An official called the secretary-general runs the Secretariat and speaks for the United Nations.

The Economic and Social Council tries to improve social services such as health and education. Other groups called specialized agencies help it in its work.

History

The United States, Great Britain, and the Soviet Union planned the United Nations. They wanted a new group to take the place of the League of Nations.

The League had been formed to keep peace after World War I (1914–18). However, it was not powerful enough to prevent World War II (1939–45).

In April 1945, near the end of World War II, people from 50 countries met in San Francisco, California, to organize the United Nations. In June they completed the United Nations Charter, or founding document. On October 24, 1945, the United Nations officially began work.

► More to explore

- Human Rights • League of Nations
- Refugee • World War II



United States



A nighttime view of Washington, D.C., shows the Lincoln Memorial in the foreground, the tall Washington Monument, and the U.S. Capitol in the background.

Established in 1776, the United States is young compared to many other countries. Yet by the 1900s the United States had grown into a world power. The capital is Washington, D.C.

Geography

The United States is the fourth largest country in the world (after Russia, Canada, and China). It extends across North America from the Atlantic Ocean on the east to the Pacific Ocean on the west. The United States is made up of 50 states and the District of Columbia. Forty-eight of the states lie between Canada on the north and Mexico and the Gulf of Mexico on the south. The 49th state, Alaska, lies northwest of

Canada. The 50th state, Hawaii, is a group of islands in the Pacific Ocean.

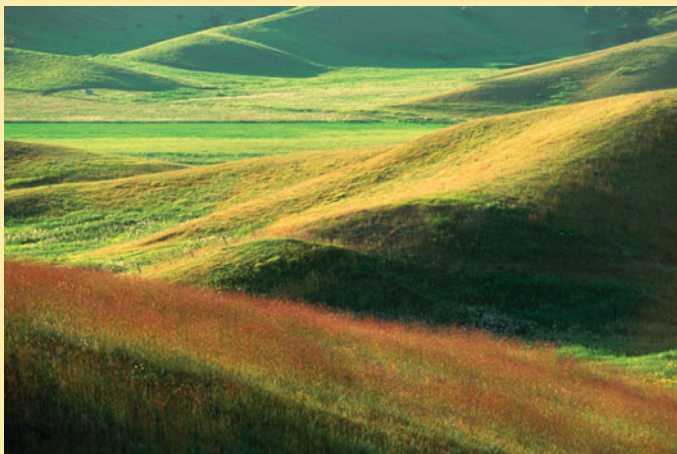
The landscape of the United States ranges from rugged mountains to flat prairies and from moist rain forests to dry deserts. The mountain ranges include the Rocky Mountains and the Sierra Nevada in the west and the Appalachian Mountains in the east. Between the Appalachians and the Rocky Mountains is a vast lowland region that includes the Great Plains. The highest point in the country is Mount McKinley, in Alaska. It is 20,320 feet (6,194 meters) high. The lowest point is Death Valley, in the California desert. It lies 282 feet (86 meters) below sea level.

The United States has some of the largest and most useful rivers and lakes in



Boaters enjoy a view of Yosemite Falls in Yosemite National Park in California.





Prairies once covered large parts of the central United States. Much of the land is now used for farming or grazing. But there are still areas where grasses cover the hills.

the world. The longest rivers are the Mississippi and the Missouri. They join in the middle of the country. The combined Mississippi-Missouri river system is 3,710 miles (5,971 kilometers) long. The five Great Lakes form the largest connected area of freshwater on Earth.

The climate of the United States is as varied as its land. It ranges from Arctic cold in Alaska to tropical warmth in Hawaii and southern Florida.

Plants and Animals

Forests in the eastern United States have pine, hemlock, oak, hickory, birch, and maple trees. Pine, fir, and spruce forests are common in the Rocky Mountains and along the Pacific coast. Grasslands cover large parts of the central plains. Sagebrush, yucca, and cactus are common in the deserts of the Southwest.

The animals of the forest include bears, elk, deer, foxes, bobcats, beavers, opossums, and raccoons. Coyotes, prairie

dogs, jackrabbits, and a few bison (buffalo) live on the grasslands. Desert animals include snakes, lizards, scorpions, and roadrunners.

People

The United States is made up of people from many backgrounds. Whites make up more than 70 percent of the population. They have roots in Great Britain, Ireland, Germany, Italy, Poland, Russia, Sweden, and other European countries. The two largest minority groups are African Americans and Hispanic Americans. Asian Americans, Pacific Islanders, and Native Americans make up small groups. Most Americans speak English. The country also has many Spanish speakers because of its large Hispanic population.

More than four fifths of the population is Christian. Protestants are the largest Christian group, followed by Roman Catholics. Other people practice Islam, Judaism, Buddhism, and Hinduism.

More than three fourths of the people live in or near cities. New York City, on

Facts About THE UNITED STATES



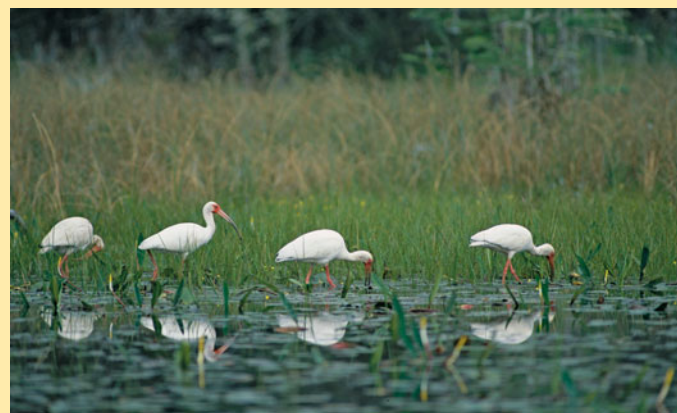
Population
(2008 estimate)
305,146,000

Area
3,616,236 sq mi
(9,366,008 sq km)

Capital
Washington, D.C.

Form of government
Republic

Major cities
New York, Los Angeles, Chicago, Houston, Philadelphia, Phoenix



A group of white birds called ibises looks for food in the Okefenokee Swamp in the U.S. state of Georgia.

the East Coast, is one of the largest cities in the world. Los Angeles, California, and Chicago, Illinois, are the country's next largest cities.

Economy

The United States is a great economic power. Service industries make up the largest part of the economy. They include finance, health care, education, and tourism. Major manufactured products include iron and steel, chemicals, electronics, motor vehicles, aircraft, and food.

The United States is rich in resources. Its farmlands produce corn, soybeans, wheat, cotton, and many other crops that are sold to countries all over the world. The United States is among the world's leading producers of several minerals, including copper, silver, zinc, gold, coal, petroleum (oil), and natural gas. Forestry and fishing are important industries, too.



A large pipe carries petroleum across the U.S. state of Alaska.



The United States is often called a melting pot because it is made up of people of many different cultures.

History

The first people to live in the Americas were the Native Americans. The first Native Americans probably came from Asia beginning about 60,000 years ago. By the 1400s there were about 200 different groups of Native Americans living on the land that became the United States.

The history of the Americas changed forever in 1492 when Christopher Columbus sailed there from Spain. After Columbus' voyage, many other explorers and settlers came from Europe. The Native Americans suffered. Some died from diseases carried by the Europeans. Others died fighting the Europeans.

Colonies

The first lasting European settlement in what is now the United States was Saint Augustine, Florida. It was built by the Spanish in 1565. The Spanish made Florida and what is now the southwestern United States into colonies. The



TIMELINE

The English set up their first lasting American colony.

1607

The United States nearly doubles its size by buying the Louisiana Territory from France.

1803

Japan attacks Pearl Harbor, Hawaii, and the United States enters World War II.

1941

Terrorists carry out attacks in New York City and near Washington, D.C.

September 11, 2001

The American colonies declare their independence from Great Britain.

1776

The American Civil War begins.

1861

The last U.S. troops fighting in the Vietnam War leave Vietnam.

1973

English, the French, and the Dutch (people from the Netherlands) also set up colonies.

taxes. The colonists protested. Tension built up between Britain and the colonies.

The English founded their first lasting settlement in North America in 1607. It was Jamestown, in what was later the state of Virginia. Then the English built other settlements and seized colonies from the Dutch. Soon there were 13 English colonies along the Atlantic coast.

In 1775 fighting broke out between colonists and British forces in Concord and Lexington, Massachusetts. These battles began the American Revolution. On July 4, 1776, the colonies approved the Declaration of Independence. This document made the colonies into the United States.

In 1700 about 250,000 people lived in the 13 colonies. By 1760 the population was nearly 1.7 million. Many of the newcomers were Africans who were brought to work as slaves, especially in the South.

The American Revolution continued until the British surrendered in 1781. By signing a treaty in 1783, Britain accepted the independence of the United States.

American Revolution

In the 1760s the British government started to tighten its control over the colonies. Parliament, the British legislature, forced the colonists to pay new

The New Country

In 1787 representatives from the states met in Philadelphia, Pennsylvania. The meeting produced a document that outlined a new government. The document was the U.S. Constitution. It took effect

in 1789. George Washington became the country's first president.

The United States soon began to grow. In 1803 President Thomas Jefferson bought the Louisiana Territory from France. The purchase added a vast area west of the Mississippi River to the United States. In 1819 the United States acquired Florida from Spain.

Texas became a state in 1845. The United States and Mexico disagreed over the border between Texas and Mexico. In 1846 the countries went to war. The Mexican War lasted until 1848. The United States defeated Mexico and took over California and the rest of the Southwest.

Civil War and Reconstruction

In the middle of the 1800s slavery divided the United States. Southern farms depended on slave labor, but many Northerners were strongly against slavery. In 1860 Abraham Lincoln was elected president. His party, the Republicans, opposed slavery. After Lincoln's election, the Southern states began to secede (withdraw) from the United States. They formed their own government. It was called the Confederate States of America, or the Confederacy.

In 1861 war broke out between the U.S. government, called the Union, and the Confederacy. This was the American Civil War. The Confederacy won most of the early battles, but by 1864 the Union was winning. In 1865 the Confederate general Robert E. Lee surrendered.



In 1987 the United States celebrated the 200th anniversary of the creation of the U.S. Constitution. As part of the celebration a group of men dressed as soldiers from the 1700s and carried flags of that time period.

The period after the Civil War is known as Reconstruction. The Republican leaders of Congress passed harsh laws to punish the South. These laws angered many Southern whites. And even though the war had ended slavery, African Americans still struggled. Many became poor farmworkers.

Growth of the Country

In the late 1800s the population of the United States grew as more people arrived from Europe. Many of them settled in cities and took jobs in factories. In the 1880s and 1890s industrial production more than doubled.

As Eastern cities grew, more people moved west. In a series of wars, settlers and the U.S. Army forced Native Americans to move onto reservations. The final defeat of the Native Americans came in the battle of Wounded Knee in South Dakota in 1890.

Presidents of the United States

Name	Political Party*	Term
George Washington	—	1789–97
John Adams	Federalist	1797–1801
Thomas Jefferson	Democratic-Republican	1801–09
James Madison	Democratic-Republican	1809–17
James Monroe	Democratic-Republican	1817–25
John Quincy Adams	National Republican	1825–29
Andrew Jackson	Democratic	1829–37
Martin Van Buren	Democratic	1837–41
William Henry Harrison	Whig	1841
John Tyler	Whig	1841–45
James K. Polk	Democratic	1845–49
Zachary Taylor	Whig	1849–50
Millard Fillmore	Whig	1850–53
Franklin Pierce	Democratic	1853–57
James Buchanan	Democratic	1857–61
Abraham Lincoln	Republican	1861–65
Andrew Johnson	Democratic (Union)	1865–69
Ulysses S. Grant	Republican	1869–77
Rutherford B. Hayes	Republican	1877–81
James A. Garfield	Republican	1881
Chester Arthur	Republican	1881–85
Grover Cleveland	Democratic	1885–89
Benjamin Harrison	Republican	1889–93
Grover Cleveland	Democratic	1893–97
William McKinley	Republican	1897–1901
Theodore Roosevelt	Republican	1901–09
William Howard Taft	Republican	1909–13
Woodrow Wilson	Democratic	1913–21
Warren G. Harding	Republican	1921–23
Calvin Coolidge	Republican	1923–29
Herbert Hoover	Republican	1929–33
Franklin D. Roosevelt	Democratic	1933–45
Harry S. Truman	Democratic	1945–53
Dwight D. Eisenhower	Republican	1953–61
John F. Kennedy	Democratic	1961–63
Lyndon B. Johnson	Democratic	1963–69
Richard M. Nixon	Republican	1969–74
Gerald R. Ford	Republican	1974–77
Jimmy Carter	Democratic	1977–81
Ronald Reagan	Republican	1981–89
George Bush	Republican	1989–93
Bill Clinton	Democratic	1993–2001
George W. Bush	Republican	2001–09
Barack Obama	Democratic	2009–

*Starting with John Adams, U.S. presidents have been elected as members of a particular political party.

By the end of the 1800s the reach of the United States extended to faraway territories. The United States bought Alaska in 1867 and claimed Hawaii in 1898. Also in 1898 the United States defeated Spain in the Spanish-American War. The United States took over Spain's colonies of Puerto Rico, Guam, and the Philippines. The United States was then a world power.

World Wars and the Depression

In 1914 World War I broke out in Europe. The United States entered the war in 1917. The American side, called the Allies, won the war in 1918.

During the 1920s the United States enjoyed peace and economic good times. But in 1929 a “crash” in the stock market started a serious economic downturn called the Great Depression. Many people lost their jobs and their savings. In the 1930s President Franklin D. Roosevelt started programs that helped businesses and farmers and gave people jobs. The programs were called the New Deal. By 1940 the United States was coming out of the Depression.

The next big challenge was World War II, which began in 1939 in Europe. The countries of Germany, Italy, and Japan were called the Axis powers. The other side included Britain, France, and the Soviet Union. They were called the Allies. On December 7, 1941, Japanese planes bombed a U.S. naval base at Pearl Harbor, Hawaii. Then the United States entered the war on the side of the Allies.

U.S. forces fought in Europe and North Africa and on islands in the Pacific Ocean. The war in Europe ended in May 1945, when Germany surrendered. The war in the Pacific ended in August 1945, after the United States dropped nuclear bombs on the Japanese cities of Hiroshima and Nagasaki.

The Cold War

After World War II the United States became involved in a tense rivalry with the Soviet Union. The Soviet Union had a Communist government. The United States wanted to keep Communism from spreading to other countries. This rivalry became known as the Cold War.

The first major conflict over Communism was the Korean War. In 1950 Communist troops from North Korea invaded South Korea. U.S. forces helped South Korea fight the Communists. The fighting lasted until 1953.

The Vietnam War was another fight over Communism. Starting in the 1950s Communist rebels tried to overthrow the government of South Vietnam. The United States helped South Vietnam. Many people protested against the war. U.S. troops gradually left Vietnam in the early 1970s.

Civil Rights

In the 1950s and 1960s African Americans struggled to gain better treatment. Their efforts became known as the civil rights movement. A minister named Martin Luther King, Jr., led nonviolent protests against segregation, or separation. The Civil Rights Act of 1964

finally guaranteed many rights to African Americans.

After the Cold War

Relations between the United States and the Soviet Union improved in the 1980s. In 1991 the Soviet Union broke up, ending the Cold War.

In the early 21st century the United States worried more about threats from terrorists than from other countries. In 2001 members of a terrorist group called al-Qaeda hijacked (seized) four airplanes and crashed three into buildings. The attacks killed nearly 3,000 people.

After the attacks President George W. Bush announced a “war on terror.” The United States attacked Afghanistan in 2001 and Iraq in 2003. Bush accused the leaders of both countries of supporting terrorism.

In 2008 the United States elected its first African American president. The new president, Barack Obama, faced many difficulties. They included the ongoing wars in Iraq and Afghanistan and a troubled economy at home.

► More to explore

American Civil War • American Revolution • Americas, Exploration and Settlement of the • Confederate States of America • Great Depression • Korean War • Louisiana Purchase • Native Americans • Reconstruction • Spanish-American War • United States Constitution • Vietnam War • Washington, D.C.

United States Constitution

The United States Constitution is the most basic law of the United States. All other laws—including local, state, and U.S. laws—must agree with the U.S. Constitution.

History

No other country has a written constitution that is older than the U.S. Constitution. However, the Constitution was a replacement for an even older set of rules called the Articles of Confederation.

The articles were written when the United States first became a country. But there were problems with the articles. In 1787 people met in Philadelphia, Pennsylvania, to change them. They soon wrote a completely new document—the Constitution. Alexander Hamilton and others then wrote essays known as the Federalist papers to explain the new Constitution.



A painting shows members of the Constitutional Convention signing the United States Constitution in 1787.

During this time, the United States had 13 states. The Constitution went into effect on March 4, 1789, after nine states had approved it. All 13 states approved it by 1790.

Federal System

The Constitution gave the United States a federal system. In a federal system different levels of government share power. In the United States the national, or federal, government shares power with the governments of the states. Even so, the national government gained more power under the new Constitution than it had had under the Articles of Confederation.

Separation of Powers

The writers of the Constitution also wanted U.S. government leaders to share power with each other. So they separated the government into three equal branches—legislative, executive, and judicial.

Checks and Balances

Each branch has some power over the others. This is called a system of checks and balances. For example, the leader of the executive branch (the president) gets to appoint, or choose, many government leaders. But part of the legislative branch (the Senate) has the power to reject the president's choices.

Amendments

The Constitution can be changed. Changes are called amendments. Amending the Constitution is hard to do. Two thirds of each house of Con-

gress and three fourths of the states must approve every amendment.

The first 10 amendments went into effect in 1791, only two years after the Constitution became official. Those amendments are called the Bill of Rights. Only 17 other amendments have been added to the Constitution since 1791.

► More to explore

Amendment • Articles of Confederation
• Bill of Rights • Federalist Papers

United States Government

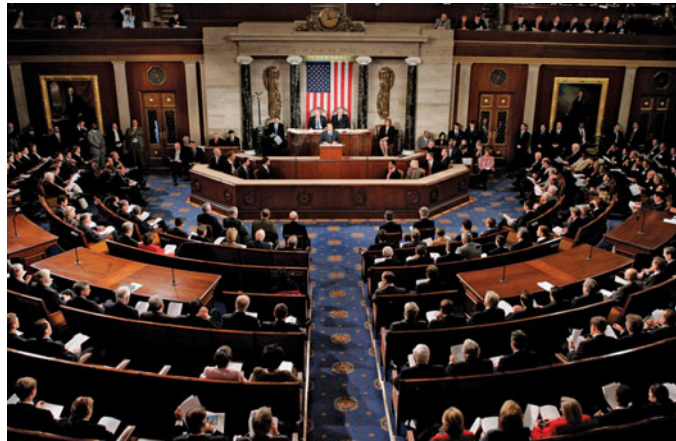
The United States government gets its powers from the United States Constitution. The Constitution organized the government into three equal branches—legislative, executive, and judicial.

Legislative Branch

The legislative branch of a government holds the power to make laws. In the United States, Congress is the legislative branch. Congress also has the power to declare war. A few legislative agencies, like the Library of Congress, help Congress in its work.

Members of Congress

Congress consists of two groups called houses. One house is the Senate. There are 100 senators, two from each state. The other house is the House of Representatives, or House. There are 435 representatives in the House. The number



U.S. senators and representatives gather in the chamber, or meeting room, of the House of Representatives to hear a foreign leader speak.

of representatives from each state is based on the state's population. States with large populations have more representatives than states with small populations.

Senators serve six-year terms. All voters in a state elect both senators from that state. States that have more than one representative, however, are divided into districts. People vote only for the representative from the district in which they live. Representatives serve two-year terms.

Both houses of Congress have leaders. The House leader is called the speaker of the House. The political party that has the most members in the House—called the majority party—chooses the speaker. The Senate leader is called the president of the Senate. The vice president of the United States serves as president of the Senate but votes only to break a tie. A senator called the president pro tempore leads the Senate

when the vice president is absent. The majority party in the Senate chooses the president pro tempore.

How Congress Makes Laws

A new law starts out as a document called a bill. First a member of the House or the Senate introduces a bill. Then it goes to a small group of representatives or senators called a committee. There are many committees. Committees have the power to make changes in bills. They also decide which bills the whole House or Senate will vote on.

Did You Know?

A member of Congress introduces a bill by dropping it into a box called the hopper.

Once the bill is ready, the House or the Senate votes on it. If more than half of the members who vote on a bill approve it, the bill passes, or gets approved. It then goes to the other house for approval. In order to become a law, a bill must be passed by both houses.

A bill passed by both houses goes to the president of the United States. If the president signs the bill, it becomes a law. However, the president can veto, or reject, a bill. A vetoed bill can still become a law, however. This happens if two thirds of both houses of Congress vote to override, or undo, the veto.

Executive Branch

The executive branch puts into use the laws that the legislative branch makes. The president of the United States leads the executive branch.

The President

Presidents serve four-year terms. Since 1951 presidents have been limited to



The Oval Office in the White House is the workplace of the president of the United States.

two terms. The vice president takes over if the president dies, gives up the job, or is unable to serve.

A group called the electoral college elects the president and the vice president every four years. Voters in a national election tell the electoral college members from their state how to vote.

Congress can accuse the president of breaking the law. This is called impeachment. The Senate decides whether the president is guilty. A guilty president must resign, or step down. Congress has impeached two presidents—Andrew Johnson and Bill Clinton—but the Senate found them both not guilty.

Executive Power

The president decides what the government should do. This is called making policy. A part of making policy is recommending laws for Congress to pass. Another part is dealing with foreign countries. As commander in

chief of the armed forces, the president can send soldiers into battle in foreign countries. However, only Congress may declare war.

The president also oversees the departments and government agencies that are part of the executive branch. These groups carry out laws and policies of all kinds.

After the Department of Homeland Security was created in 2002, there were 15 departments in all. The president appoints their leaders. The leaders form a group that is called the Cabinet. The Cabinet gives advice to the President.

Judicial Branch

The judicial branch, or judiciary, is a system of courts. Officials called judges run the courts. The courts use the U.S. Constitution and other laws of the U.S. government to settle cases.

The president of the United States appoints all federal judges, but the Senate must approve them. Once approved, the judges serve until death or retirement. Federal judges, like presidents, can be impeached.

Lower Courts

The district courts are the lowest level of U.S. courts. District court trials usually

Executive Departments	
Department	Important Duties
Department of Agriculture	Helps farmers; works to improve farming
Department of Commerce	Works to protect businesses; carries out census
Department of Defense	Oversees the armed forces
Department of Education	Works to improve education
Department of Energy	Manages the use of energy, including nuclear energy and fossil fuels
Department of Health and Human Services	Oversees social security programs; ensures that food and drugs are safe
Department of Homeland Security	Works to prevent terrorism in the United States and protect national borders
Department of Housing and Urban Development	Works to improve housing and public areas of cities
Department of the Interior	Oversees national parks and Native American affairs
Department of Justice	Fights crime; oversees national prisons
Department of Labor	Carries out laws that protect workers
Department of State	Deals with foreign countries; protects U.S. citizens outside the United States
Department of Transportation	Works to keep highway, railroad, and airplane travel safe and well organized
Department of the Treasury	Collects taxes; pays the government's bills; prints money
Department of Veterans Affairs	Helps veterans (people who have served in the U.S. armed forces)
Note: The heads of these departments belong to the president's Cabinet. Source: The White House (http://www.whitehouse.gov)	

The president of the United States oversees the 15 departments of the executive branch.



John G. Roberts, Jr., appears before a U.S. Senate committee. Roberts was the president's choice to be chief justice of the United States, or chief judge of the Supreme Court. But he could not start work until the Senate had approved him. Each branch of government has some power over the other two.

feature a jury and witnesses. A person who loses a case in a district court can appeal, or challenge, the decision in a circuit court of appeals. Panels, or groups, of judges usually hear cases in courts of appeals. They have the power to overturn, or undo, the judgments of the lower courts.

Supreme Court

The Supreme Court is the highest court in the United States. The nine judges on the Supreme Court are called justices. One is the chief justice. The others are associate justices.

Most of the cases that the Court hears are appeals of cases that lower courts have already decided. The justices vote on which cases they will hear.

When the Court hears a case, lawyers for both sides get a chance to speak. But there are no witnesses, and there is no

jury. After hearing the case, the justices meet in private to make a decision. A majority of the justices must agree before the Court can make its decision.

One justice writes a statement called an opinion to explain the decision. Justices who disagree with the decision can write their own opinions, which are called dissenting opinions. Judges on lower courts often use Supreme Court opinions to decide later cases.

A Supreme Court decision may be reversed by amending, or changing, the Constitution. The Court also may reverse one of its own decisions in a later case. For example, in 1896 it allowed segregation (forced separation of blacks and whites) in public places. Then in 1954, in the case of *Brown vs. Board of Education of Topeka*, the Court ruled that segregation of public schools was illegal.

Judicial Review

The Supreme Court has the power to overturn a U.S. law or a state law that does not follow the U.S. Constitution.



The nine members of the U.S. Supreme Court are called justices. They wear robes in their courtroom.

The Court declares such laws to be unconstitutional. This power, called judicial review, is not mentioned in the Constitution. The Court first used judicial review in 1803, in a case called *Marbury vs. Madison*.

► More to explore

Electoral College • Government • Law
• Political Party • United States
Constitution • Voting

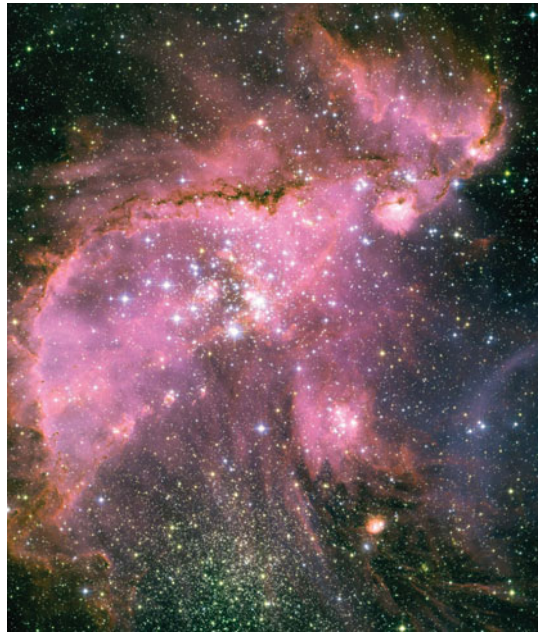
Universe

The universe is everything that exists, including objects and energy, throughout time and space. Earth, the sun, and the rest of the solar system are only a very small part of the universe. The size of the universe is difficult to imagine. It is so large that light from very distant objects in the universe must travel billions of years before reaching Earth.

The universe is also called the cosmos. Cosmology is the branch of science that studies the universe as a whole. Astronomy is another name for the study of the universe.

The Milky Way and Other Galaxies

The sun is in a group of stars known as the Milky Way galaxy. A galaxy is a large system of stars, gas, and dust. Until the early 1900s scientists did not know for certain that there were galaxies outside the Milky Way. By using powerful telescopes, scientists now estimate that the universe has billions of galaxies.



A picture taken from the Hubble Space Telescope shows a galaxy called the Small Magellanic Cloud. New stars are forming from the galaxy's hot gas and dust.

The Milky Way galaxy alone contains more than 100 billion stars. Some galaxies are larger, and some are much smaller. But even small galaxies contain hundreds of millions of stars. Galaxies have a variety of shapes. For example, some galaxies have the shape of a pinwheel.

The Expanding Universe

Most scientists believe that the universe began suddenly in an event called the big bang. They estimate that this happened between 10 and 15 billion years ago. At first the universe was tightly packed and hot. In the time since then it has expanded and cooled off. Clouds of matter have come together to form stars, planets, and other objects in space. Some scientists believe that the universe may stop expanding and begin to

contract. But most scientists believe that the universe will keep expanding forever.

► More to explore

Astronomy • Galaxy • Solar System
• Space Exploration

Ural Mountains

The Ural Mountains of Russia form the traditional boundary between Europe and Asia. The Urals are about 1,550 miles (2,500 kilometers) long. They extend from the Kara Sea in the north to the Ural River in the south. The highest peak is Mount Narodnaya at 6,217 feet (1,895 meters).

The northern slopes of the Urals are mostly covered with forests. Common trees include oak, linden, elm, fir, pine, and spruce. Treeless land called tundra is found in the far north, especially at high elevations. Arctic foxes, reindeer, brown bears, lynx, wolverines, and elk are among the animals of the range.

The economy of the Urals depends on mineral supplies. Mountain mines produce iron ore, copper, chromite, gold, silver, and platinum. Factories make



The Belaya River runs through the southern part of Russia's Ural Mountains.

metal goods, chemicals, and machinery. The huge forests of the Urals provide valuable wood. Farmers in the south grow wheat, buckwheat, millet, potatoes, and vegetables.

Russians entered the northern Urals in the late 1000s. However, they did not discover the range's mineral riches until the 1600s. In the 1700s the Urals became one of Russia's most important industrial areas.

► More to explore

Russia



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Uranus

Uranus was the first planet to be discovered after the invention of the telescope. It is the seventh planet from the sun. It travels around the sun at an average dis-

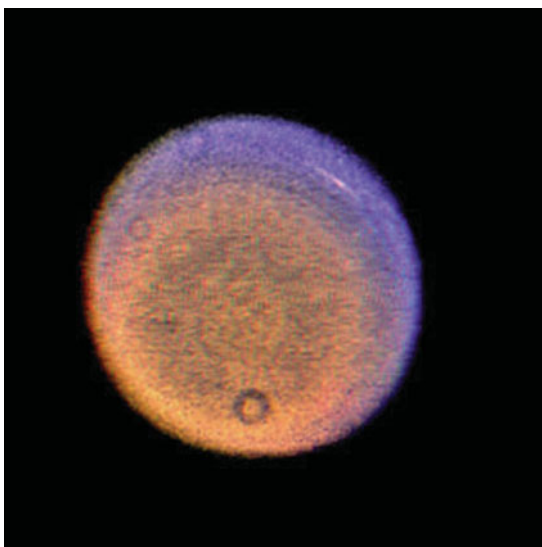
tance of about 1.8 billion miles (2.9 billion kilometers).

Physical Features

Uranus is the third largest planet in the solar system. Its diameter, or distance through its center, is about 32,000 miles (51,000 kilometers). That is about four times the diameter of Earth. Uranus is most similar in size to Neptune, its outer neighbor.

Uranus is one of the planets that are called gas giants. It is made up mostly of gases, mainly hydrogen and helium. Small amounts of the gas methane give the planet a blue-green color. Uranus has no solid surface. Underneath its huge layers of gases, it has a smaller area of thick, hot liquid.

Narrow rings surround Uranus. These rings seem very unlike the bright, icy rings of the planet Saturn. The rings that



The spacecraft Voyager 2 photographed the gassy planet Uranus in 1986. Experts changed the colors in the image in order to make the details easier to see.

surround Uranus are made of some unusually dark material.

Orbit and Spin

Like all planets, Uranus has two types of motion: orbit and spin. Uranus orbits, or travels around, the sun. It takes about 84 Earth years to complete one orbit. In other words, a year on Uranus equals about 84 Earth years.

Uranus spins about its center in an unusual way. It is tilted so that it spins nearly on its side. Also, Uranus is one of the few planets in the solar system to spin in a clockwise direction. Uranus completes one rotation in about 17 hours, so a day on Uranus lasts about 17 hours.

Moons

More than 25 moons orbit Uranus. Its five major moons are Oberon, Titania, Ariel, Umbriel, and Miranda. They seem to be composed of ice and rock. Some of them have deep valleys and many large pits called craters.

Observation and Exploration

Uranus cannot be seen from Earth without the use of a telescope. The astronomer William Herschel discovered Uranus using his telescope in 1781. Uranus' rings were discovered in 1977.

Only one spacecraft has visited the distant planet. The unmanned U.S. spacecraft Voyager 2 flew by Uranus in 1986.

► More to explore

Neptune • Planets • Solar System
• Space Exploration • Telescope

Did You Know?

Sometimes storms occur on Uranus. However, Uranus seems to have fewer storms than the other gas giants do.

Urinary System

Humans need vitamins, minerals, and other parts of foods and drinks in order to live. As the body uses these things, it creates substances that are not needed. To stay healthy, the body must get rid of these substances, called waste. The digestive system forms solid waste from food. Solid waste leaves the body through the anus, at the end of the large intestine. The urinary system forms liquid waste, or urine, in the kidneys. The bladder stores this urine until it leaves the body through a tube called the urethra.

Kidneys

In human beings and most other animals the blood absorbs the wastes created by the body. The blood carries these wastes into two bean-shaped organs

called kidneys. The kidneys sit behind the stomach on each side of the spine.

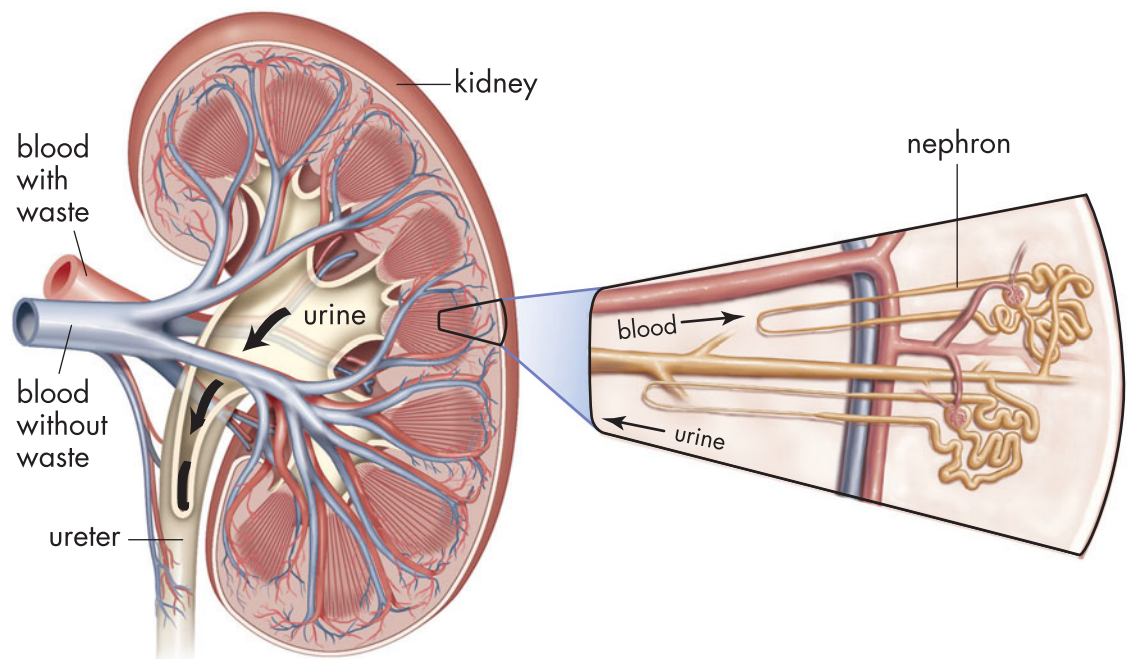
Kidneys do several things. They take out any useful substances from the blood and return them to the bloodstream. They also take out liquid wastes and extra water from the blood. The kidneys then combine the wastes and the water to make urine.

Bladder

Urine travels from each kidney down a tube called a ureter. The two ureters lead to the bladder. The bladder is a muscular organ that expands like a balloon as it fills with urine.

Urination

When the bladder is full, nerve endings in the bladder send a message to the brain. This message lets the person know that the bladder needs to be emptied.



Blood containing waste enters a kidney. Within the kidney, tiny units called nephrons create urine from waste and water in the blood. The blood then exits the kidney without the waste. The urine leaves the kidney through a tube called the ureter.

Humans learn as children how to hold in the urine by tightening nearby muscles. When the muscles relax, urine passes out of the bladder. It flows through a tube called the urethra and out of the body. This process is called urination.

Problems with the Urinary System

Like other parts of the body, the organs of the urinary system may become infected. This can make urination painful. Several diseases can cause the kidneys to stop working correctly. Wastes then build up in the body and make the person sick.

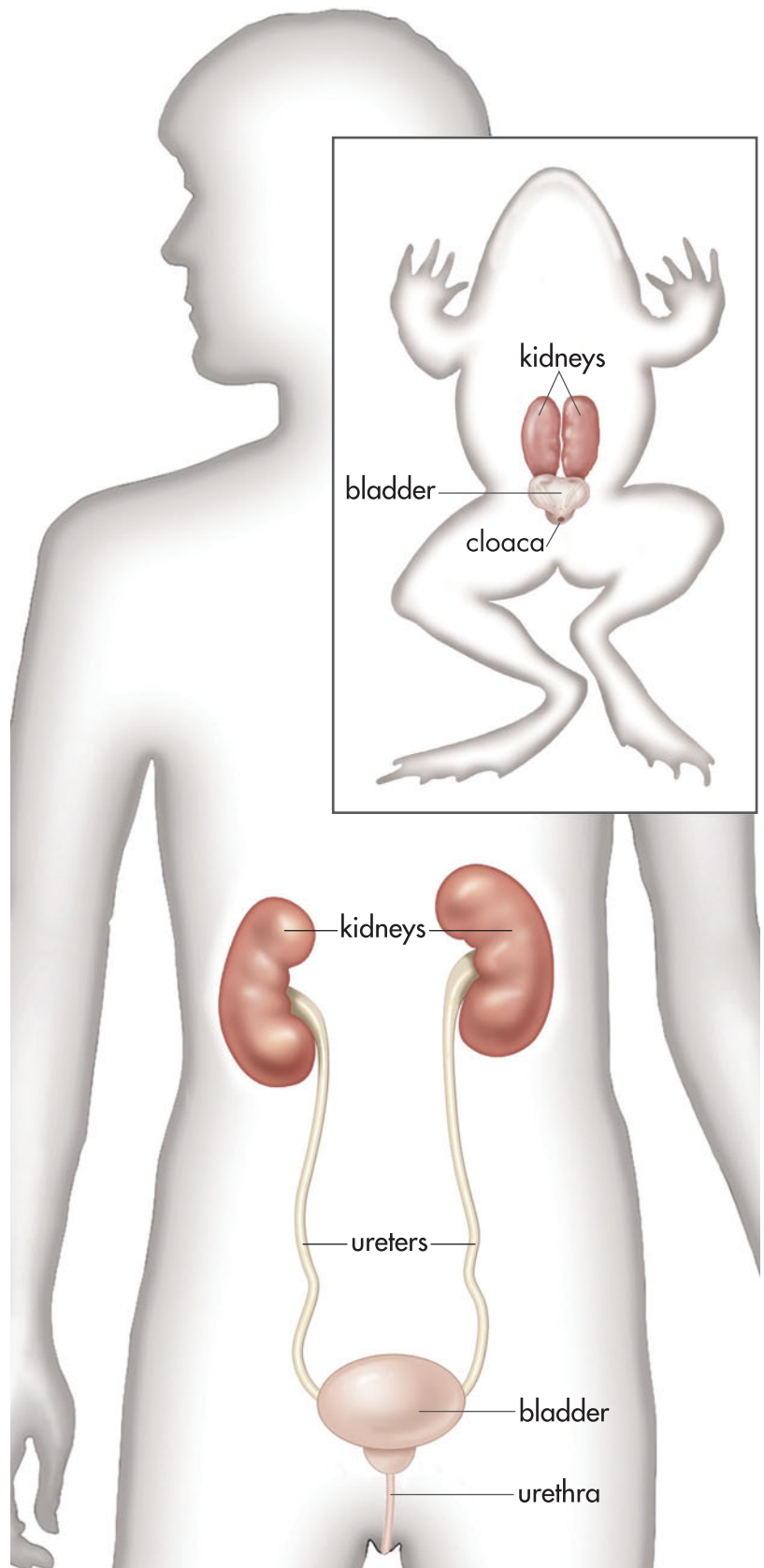
If the kidneys fail, doctors may use a technique called dialysis to remove wastes from the blood. In dialysis the patient's blood travels out of the body, through a cleaning machine, and back into the body. Doctors may also transplant a healthy person's kidney into the patient.

Urinary Systems in Other Animals

Like humans, most animals with a backbone have kidneys and a bladder. However, in birds, reptiles, and amphibians, urine collects in a chamber called a cloaca before leaving the body. Solid waste also collects in the cloaca. Unlike the watery urine of mammals and fish, the urine of birds and reptiles is white and thick. The urine of land insects is solid.

► More to explore

Digestive System • Kidney



Humans and frogs both have kidneys and a bladder in their urinary systems. Frogs and other amphibians have a cloaca as well.



Uruguay

Uruguay is a small country on the east coast of South America. Uruguay's capital is Montevideo.

Geography

Uruguay is the second smallest country in South America, after Suriname. Uruguay borders Brazil in the north and Argentina in the west. To the southeast is the Atlantic Ocean. To the south is a part of the Atlantic called the Río de la Plata.

Hills and plains cover most of the land. The Uruguay River runs along the border with Argentina. The largest river system in Uruguay is the Río Negro. A dam on this river created the Embalse del Río Negro, the largest lake in the country.

Uruguay has mild winters and warm summers. Rain is heaviest in the autumn.



A gaucho (South American cowboy) herds cattle in central Uruguay.

Plants and Animals

Tall prairie grasses cover most of Uruguay. The country has few forests. Alder, willow, eucalyptus, and poplar trees and aloe plants grow near the rivers.

Some pumas and jaguars live in Uruguay. Other native animals include foxes, deer, wildcats, and large rodents called capybaras. Caimans, which are similar to alligators, live in the Uruguay River. Uruguay's birds include vultures, parakeets, and flamingos.

People

Most Uruguayans have Spanish or Italian ancestors. Mestizos, or people with mixed European and American Indian roots, form a small group. A smaller number of people have African roots. Almost all Uruguayans speak Spanish. Roman Catholicism is the main religion. Most people live in cities. Montevideo is many times larger than Salto, the second-largest city.

Economy

Most Uruguayans work in services, including banking, communications, and tourism. However, agriculture is very important to the economy. Large herds of cattle and sheep live on the grasslands. The animals provide beef, wool, leather, and dairy products. Uruguay sells these products to other countries. Farmers also grow rice, wheat, corn, oranges, and sugarcane. Fishing is another source of food. Uruguay's factories produce fuels, chemicals, beverages, machinery, and other goods.

History

A group of American Indians known as the Charrúa lived in the Uruguay region hundreds of years ago. Spanish explorers arrived in 1516, but they did not settle the land.

Banda Oriental

The Spanish called the area the Banda Oriental del Uruguay. The name means "east bank of the Uruguay River." Bands

of gauchos, or Spanish cowboys, hunted the stray cattle that roamed through the region. But the gauchos did not form permanent settlements.

In 1680 the Portuguese set up a town in the Banda Oriental. The Spanish founded the city of Montevideo in 1726 and attacked the Portuguese. By the late 1770s the Spanish had driven out the Portuguese.

In 1810 Spain's American colonies began fighting for independence. People in the Banda Oriental defeated the Spanish. However, Brazil soon took over the Banda Oriental. After several years of war the Banda Oriental finally won independence in 1828. The new country was called Uruguay.

Independence

Civil war erupted in Uruguay soon after independence and continued for about 70 years. Uruguay became a stable democracy in the early 1900s. In the 1960s a terrorist group called the Tupamaros began trying to overthrow the government.

The military took control of the government in 1973. The military defeated the Tupamaros, but it also ruled very harshly. The military government jailed, tortured, or killed many people who disagreed with it. A democratic government finally replaced the military leaders in 1985.

► **More to explore**
Montevideo

Facts About URUGUAY



Population
(2008 estimate)
3,350,000

Area
68,037 sq mi
(176,215 sq km)

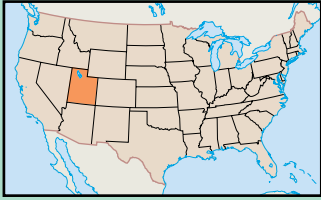
Capital
Montevideo

Form of government
Republic

Major cities
Montevideo,
Salto, Paysandú,
Las Piedras,
Rivera



The Punta del Este is a popular place for vacations in southern Uruguay. Hotels line the beaches along the Atlantic Ocean.



Utah

Each year on July 24, the U.S. state of Utah celebrates Pioneer

Day. This holiday marks the day in 1847 when a group of Mormons seeking religious freedom entered the Great Salt Lake valley. These settlers worked hard to build their community. Their hard work is reflected in both the state's nickname, the Beehive State, and its motto, "Industry."

Today Mormons make up more than half of Utah's population. The Mormon church still has a strong influence on life in the state. Salt Lake City, the state capital, is home to the world headquarters of the Mormon church.

Geography

Utah is a Western state. It is bordered on the north by Idaho and Wyoming, on the east by Colorado, on the south by Arizona, and on the west by Nevada.

Plateaus cover the southeastern part of the state. This is an area of high mesas, brightly colored canyons, and the Colorado River. Western Utah is a broad, flat area with deserts and some mountain peaks. Located in this region are the Great Salt Lake and the Great Salt Lake Desert.

The northeastern part of the state is part of the Rocky Mountains. The Wasatch and the Uinta mountain ranges are in this region. Utah's climate is dry, with warm summers and cold winters.

People

Utah is one of the nation's most sparsely populated states. In other words, very few people are spread throughout Utah's very large countryside. More than 85 percent of the people are white and of European heritage. Hispanic Americans, the largest minority group, make up about 9 percent of the population.

Economy

Service industries are the largest part of Utah's economy. They include health care, engineering, telemarketing, and computer-related services. Banking and tourism are also important in the state. More than 18 million tourists travel to Utah each year. Among the items manu-





The colorful formations of Bryce Canyon National Park attract many visitors to Utah.

factured in Utah are transportation equipment, metals, and processed foods.

Much of Utah's farm income comes from cattle and hogs. Utah's primary crop is hay.

History

Navajo, Ute, Shoshone, and Paiute Indians lived in the Utah region before white settlers arrived. Mexico claimed the Utah area in 1821. Around this time adventurers known as mountain men arrived in the region to take part in the fur trade. Trappers set up trading posts in the area in the 1820s and 1830s. After a war with Mexico, the United States gained control of Utah in 1848.

The first group of Mormons entered Utah in July 1847. In 1849 the colonists formed the State of Deseret, with Brigham Young as the first governor. A year later the United States created Utah Territory.

The Mormons applied for statehood six times between 1849 and 1887. The fed-

eral government, however, would not allow Utah to become a state. The issue preventing statehood was the Mormon custom of polygamy (one husband having several wives). In 1890 the Mormon leadership banned polygamy, and in 1896 Utah became the nation's 45th state.

During World War II Utah's mining industry increased to meet war needs. In the 1960s the state became a center for defense industries, both for research and for manufacturing.

In the 1990s the population in Utah increased by almost 30 percent. It continued that growth in the following decade, adding more than 20 percent to its population by 2008. In 2002 Salt Lake City hosted the Winter Olympic games.

► More to explore

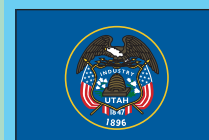
Mormon • Salt Lake City



The Great Salt Lake is in the middle of a very dry area in the U.S. state of Utah. Several rivers feed into the lake. But because the land is so dry, the water evaporates quickly. The water that remains is very salty. Where the water has dried up completely it leaves behind salt crystals.

Facts About UTAH

Flag



Population

(2000 census)
2,233,169—
rank, 34th state;
(2008 estimate)
2,736,424—
rank, 34th state

Capital

Salt Lake City

Area

84,899 sq mi
(219,887 sq
km)—rank, 13th
state

Statehood

January 4, 1896

Motto

Industry

State bird

California gull



State flower

Sego lily



Ute

The Ute are Native Americans of Colorado and Utah. Their traditional homeland also included parts of New Mexico. The U.S. state of Utah was named after the tribe.

The Ute built cone-shaped houses made from poles covered with brush or grass. The lands of the Ute were mostly very dry. The only foods available there were roots, seeds, lizards, insects, rodents, and some other small animals. The Ute traveled to the Rocky Mountains to hunt larger animals and to fish. The Ute got horses beginning in the 1600s. After that they sometimes rode to the Great Plains to hunt bison (buffalo).

Spanish traders began arriving in Ute territory in the 1500s. The Ute traded with the Spanish. They also sometimes fought with them. In the 1840s U.S. settlers began to arrive in the Ute lands. By the end of the 1870s the U.S. government had forced the Ute to give up their territory. The tribe moved onto reservations in Colorado and Utah. At



The Ute often carved pictures on rocks. These carvings are known as petroglyphs.

the end of the 20th century there were more than 7,000 Ute living in the United States.

► More to explore

Native Americans

Utopia

A utopia is an ideal, or perfect, place. The word first appeared in a book written by Sir Thomas More in the 1500s. More came up with “utopia” by combining Greek words meaning “no place.” Some people have thought that though no ideal community exists, people can create one by working together.

In More’s book, Utopia is an imaginary kingdom that is free from all cares, anxieties, and miseries. Everyone lives in a pleasant home surrounded by a garden.

More’s *Utopia* was not the first book of its kind, and it was not the last. The ancient Greeks wrote about utopias more than 2,000 years ago. Utopian books were especially common in the 1800s, when new scientific ideas made people think about a better future. Utopias became a common theme in science fiction.

People have tried many times to establish utopian communities. In North America alone, more than 130 utopian settlements were started between 1663 and 1858. Most failed.

► More to explore

Science Fiction

Uzbekistan

Uzbekistan is a country in central Asia. The capital is Tashkent.

Uzbekistan shares borders with Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, and Turkmenistan. The only mountains are in the far eastern part of the country. The Aral Sea is in the northwest. Uzbekistan has a dry climate with hot summers and cool winters.

Uzbekistan has few forests. Grasses grow in much of the country. Rodents, foxes, wolves, and gazelles live in the west. Boars, deer, bears, wolves, goats, and lynx live in the mountains.

About three fourths of the people are Uzbeks. There are also small groups of Russians, Tajiks, and Kazaks. Islam is the main religion.

Many of Uzbekistan's people work in agriculture. Uzbekistan is one of the largest cotton growers in the world.



Ichan-Kala, or Royal Court, is a historic area of Khiva, Uzbekistan. It has many ancient buildings.

Other crops include wheat, vegetables, and grapes. Farmers also raise cattle, sheep, and goats. The land provides natural gas, oil, gold, copper, and other minerals.

In ancient times a trade route called the Silk Road ran through the area. In the 700s Arabs brought in the religion of Islam. Uzbeks came from the north in the early 1500s.

The Uzbeks ruled until the 1800s, when Russians took control. In 1924 the Soviet Union made Uzbekistan one of its republics, or states. Uzbekistan gained independence in 1991.

► More to explore

Aral Sea • Tashkent • Union of Soviet Socialist Republics



Facts About UZBEKISTAN



Population
(2008 estimate)
27,345,000

Area
172,700 sq mi
(447,400 sq km)

Capital
Tashkent

Form of government
Republic

Major cities
Tashkent, Namangan, Samarkand, Andijon, Bukhara



The English scientist Edward Jenner created the first vaccine, a vaccine against smallpox, in 1796.

(See Vaccine.)

During his lifetime the Dutch artist Vincent van Gogh sold only one painting.

(See Van Gogh, Vincent.)

Vatican City, which is inside the city of Rome, Italy, is the smallest country in the world.

(See Vatican City.)

Queen Victoria was queen of the United Kingdom from 1837 to 1901. She reigned over her country longer than any other British king or queen before her.

(See Victoria, Queen.)

Fresh lava may be as hot as 2,200° F (1,200° C).

(See Volcano.)

Vaccine

Vaccines are substances that prevent the spread of disease. Giving people vaccines can save millions of lives. For example, smallpox killed some 2 million people in 1967. By 1979 the disease had disappeared. This change resulted from a worldwide program of vaccination.

How Vaccines Work

Many diseases are caused by tiny germs called bacteria or viruses. When people are vaccinated against a disease, they are purposely given the bacteria or virus that causes the disease. They can receive the vaccine in a shot, by mouth, or by a nose spray.

The bacteria or virus in a vaccine is dead or weakened. It causes little if any sickness in the person who receives it.

Instead it causes the body's immune system to make proteins called antibodies, which fight disease. If the same bacteria or virus enters the body later on, the immune system will know how to fight it off.

History

An English doctor named Edward Jenner created the first vaccine in 1796. He saw that people who got the mild disease called cowpox rarely got smallpox, which is more serious. He did experiments to find out why. He scratched material from a cowpox sore into the skin of a healthy boy. The boy got cowpox. Then Jenner scratched material from a smallpox sore into the boy's arm.



A child gets a shot containing a vaccine to protect her against disease.

The boy stayed healthy. The cowpox material was a vaccine against smallpox.

The French scientist Louis Pasteur was another important researcher. In the 1880s he developed a vaccine against rabies. He used a weakened form of the rabies virus to protect against a full attack by the same virus.

Since Pasteur's time, scientists have produced vaccines against many diseases. In the middle of the 1900s Jonas Salk created a vaccine that almost wiped out polio. Vaccines have also been developed for mumps, measles, cholera, plague, tuberculosis, influenza, and hepatitis.

► More to explore

Disease, Human • Immune System
• Pasteur, Louis • Salk, Jonas

Vacuum

A vacuum is a space with nothing in it—not even air. On Earth there is no such thing as a total vacuum because it is impossible to remove all the air from a

space. But partial vacuums are common. A partial vacuum is a space with almost no air inside.

Vacuums do not exist naturally on Earth. Air surrounds everything on Earth, and it extends for miles above Earth. All of the air above Earth is pushing down all the time. This is known as air pressure. Because of the pressure, air will try to fill any space. In outer space, however, there is no air, so all of outer space is a giant vacuum. That is why astronauts must wear space suits. The suits hold in air at the pressure that humans are used to on Earth. Otherwise their bodies would not function.

A partial vacuum can be made on Earth by removing all solids and liquids and then pumping air out of a container or some other enclosed space. Vacuums have many uses. A vacuum cleaner picks up dirt by sucking air into a vacuum. A medicine dropper creates a vacuum to suck liquid into a tube. A vacuum bottle, or Thermos, is a container with a double wall. A vacuum between the walls stops heat from flowing to or from the outside air. This helps keep the liquid inside cold or warm. Vacuums are



Vacuum packing helps keep foods fresh.

useful in industry, too. For example, food companies use vacuum packaging to help keep food from spoiling.

► More to explore

Air

Vaduz



Vaduz is the capital of Liechtenstein, a country in central Europe. The town lies in the Rhine River valley. It is Liechtenstein's cultural center. The castle of the ruling prince of Liechtenstein overlooks the town.

Tourism is important to the economy of Vaduz. Small factories in the town make high-technology equipment and other products.

Vaduz dates back to at least the 1300s. The town was destroyed in 1499 in a war between Switzerland and the Holy Roman Empire. Vaduz was rebuilt in the early 1500s. It became a state within the Holy Roman Empire.

In 1719 Vaduz was combined with a state called Schellenberg to form Liechtenstein. The Holy Roman Empire existed until 1806. Then Liechtenstein



The prince of Liechtenstein lives in Vaduz Castle in Vaduz, Liechtenstein.

became a German state. In 1866 it became an independent country with Vaduz as its capital.

► More to explore

Liechtenstein

Valentine's Day

Valentine's Day is a holiday that people celebrate on February 14. It is also called Saint Valentine's Day. On Valentine's Day people greet loved ones, close friends, family members, and school classmates by sending them cards called valentines. People also give candy, flowers, and other gifts to loved ones. Valentine's Day gifts often come packed in a red, heart-shaped box.

People have celebrated Valentine's Day with thoughts of love since at least the 1300s. According to an old European legend, February 14 is the day when birds pair off each year to start their new families. February 14 is called Valentine's Day because the Roman Catholic church honors two saints named Valentine on that day. Both Saint Valentines

were ancient Romans of the AD 200s who died for their Christian faith.

Groups of young men and women once celebrated Valentine's Day by picking up valentines from a box. The person whose valentine was picked up would become the picker's "valentine" for a year.

► More to explore

Festival and Holiday

Valhalla

In the tales of the Vikings and other early people of Scandinavia, Valhalla was a heaven for warriors. Scandinavia is a region of northern Europe. Its tales are known as Norse mythology.

According to the tales, Valhalla was a vast banquet hall. It had at least 540 doors and a roof made of shields. The powerful Norse god Odin ruled over Valhalla. He allowed only warriors who had died bravely to go there.

Female spirits called Valkyries watched over battlefields. They brought dead heroes to Valhalla. The warriors of Valhalla ate the flesh of a boar (pig) that was butchered every day and then magically came back to life.

It was said that the dead warriors would enjoy Valhalla until the end of the world. Then they would rise again to fight against evil giants and demons in a final battle called Ragnarök.

► More to explore

Odin • Vikings

Did You Know?

The slain warriors who lived in Valhalla were called the Einherjar.

Valletta



Population
(2005
estimate), city,
6,300; urban
area, 81,050

Valletta is the capital of Malta, an island country in the Mediterranean Sea. The city is on the coast of the country's largest island, which is also named Malta. Valletta lies on a piece of rocky land that sticks out into a bay.

Trade and tourism are important to the economy of Valletta. It is one of the country's main ports.

A group of Roman Catholic knights founded Valletta in the 1560s. It became the capital of Malta in 1570.

Great Britain took control of Malta in the early 1800s. The British used Val-



A passenger ship rests in the harbor of Valletta, Malta.

letta as a base for their Navy. During World War II (1939–45) the city was bombed many times. Malta became an independent country in 1964. Valletta remained its capital.

► More to explore

Malta

Valley

A valley is a long depression, or ditch, in Earth's surface. It usually lies between ranges of hills or mountains. Most valleys are formed by rivers that erode, or wear down, soil and rocks. This process takes thousands or millions of years.

River Valleys

Like other landforms, river valleys are always changing. Rivers continually wear away the land through which they flow, gradually making the valleys deeper. At the same time, other forces loosen material on the valley walls. These forces include rain, frost, and wind. The eroded material from the valley walls falls into the river and is carried away.

Valleys are usually narrow when they are first formed. Over time, however, most valleys become wider as the walls are worn away. One valley might grow wider than another because the river flows through a softer type of rock that erodes more easily. The force of the river's flow also affects how a valley changes over the years.

Canyons are very narrow, deep river valleys cut through hard rock. They have steep sides that run almost straight up and down. Canyons can be several thousand feet deep. Smaller valleys of this kind are called gorges. Some canyons are remarkable landforms. The Grand Canyon, in the U.S. state of Arizona, is 0.1 to 18 miles (0.2 to 29 kilometers) wide and more than a mile (1.6 kilometers) deep in some places. It was carved by the Colorado River.

Glacial and Rift Valleys

Not all valleys are formed by rivers. Some valleys are formed by huge, slowly moving bodies of ice called glaciers. Thousands of years ago glaciers covered large parts of Earth's surface. As the glaciers moved along, they scraped the land and carried away giant boulders and huge amounts of soil. They left valleys behind.

Other valleys are formed by movements of the huge plates, or pieces of land, that make up Earth's surface. These are called rift valleys. Rift valleys are formed when the edge of one plate



A wide valley lies between mountains in Nepal.

slides downward under the edge of another plate.

► More to explore

Erosion • Glacier • River

Van Buren, Martin

Martin Van Buren was the eighth president of the United States. He helped to found the Democratic Party.

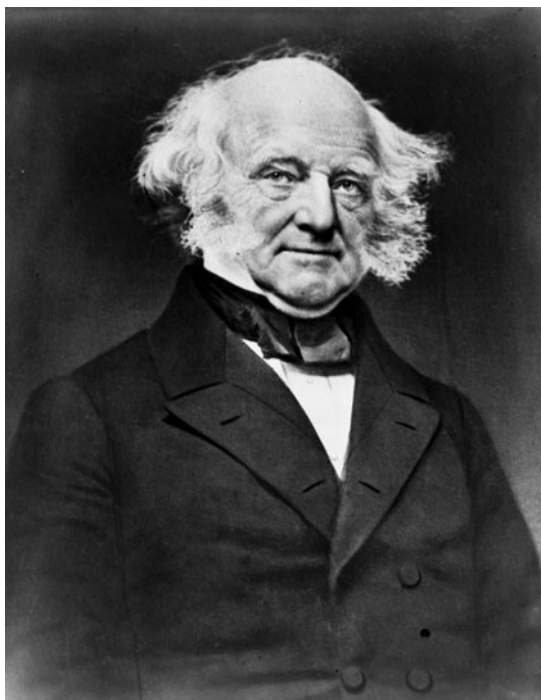
Early Life

Martin Van Buren was born on December 5, 1782, in Kinderhook, New York. He was the son of Abraham Van Buren, a farmer and tavern keeper, and Maria Hoes Van Alen. Both of his parents had Dutch roots.

After studying with a village lawyer, Van Buren started a law practice in 1803. In 1807 he married Hannah Hoes. They had four sons. Van Buren's wife died in 1819. He never remarried.



A river flows through the valley that it carved out over thousands of years.



Martin Van Buren was the eighth president of the United States.

Van Buren was a member of the Democratic-Republican Party, started by President Thomas Jefferson. In the mid-1820s that party split up. Van Buren and followers of Andrew Jackson formed a new political party—the Democratic Party.

In 1828 Van Buren won election as governor of New York. After three months he resigned to become secretary of state under President Jackson.

After Jackson was reelected in 1832, Van Buren became vice president. In 1836 the Democrats chose Van Buren to run for president. Van Buren defeated his opponents in the Whig Party.

Political Career

Van Buren was a successful lawyer, but politics became his main interest. From 1812 to 1820 Van Buren served in the New York Senate. He also served as state attorney general. In 1821 he entered the U.S. Senate.

Presidency

Soon after Van Buren took office, a financial crisis struck the nation. Many banks and businesses failed. The president offered no help. He asked Congress to set up a treasury to protect the government's money.



TIMELINE

Van Buren is born in Kinderhook, New York.

December 5, 1782

Van Buren enters the U.S. Senate.

1821

Van Buren is elected vice president under Andrew Jackson.

1832

Van Buren is elected president.

1836

Van Buren stops a dispute over Maine's border.

1839

Van Buren loses reelection to William Henry Harrison.

1840

Van Buren dies in Kinderhook.

July 24, 1862

Van Buren lost more popularity over a long and costly war with the Seminole people in Florida. He also faced widespread anger over his failure to annex, or take over, the Republic of Texas. However, in 1839 Van Buren successfully stopped a dispute between Maine and New Brunswick, Canada, over Maine's northeastern border.

Later Years

William Henry Harrison defeated Van Buren in the presidential election of 1840. In 1848 Van Buren ran for president as a member of the Free Soil Party, but he received few votes.

Van Buren then traveled in Europe before retiring to his estate in Kinderhook. He died there on July 24, 1862.

► More to explore

Jackson, Andrew • Political Party • Texas
• United States

Vancouver



Population
(2006 census),
city, 578,041;
metropolitan
area,
2,116,581

Vancouver is the largest city in the Canadian province of British Columbia. It is also the third largest metropolitan area in Canada, after Toronto and Montreal. With its mild climate and beautiful



Vancouver, British Columbia, is known for its scenic setting, including its harbor.

ful scenery, Vancouver attracts many visitors from Canada and around the world.

Vancouver is in southwestern British Columbia. It is just north of the U.S. state of Washington. It sits on a piece of land that juts out into the Strait of Georgia, an arm of the Pacific Ocean. Steep mountains lie to the north. Vancouver Island lies across the Strait of Georgia.

Vancouver has a fine natural harbor. The harbor has made the city into a gateway to the Pacific Ocean. Products of Canada's farms, forests, mines, and factories come to Vancouver by railroad. Then they are shipped around the world. Asian products come into the city from across the Pacific. The city's economy also relies on tourism, manufacturing, and construction.

Native Americans lived on the site of Vancouver at least 2,500 years ago. An English naval officer named George

Did You Know?

More movies are filmed in Vancouver than anyplace else in North America except for Los Angeles, California, and New York City.

Vancouver explored the coast in 1792. The city was later named after him.

Europeans settled in the area in 1866. The settlement became a city in 1886. Much of the city burned in the same year but was quickly rebuilt. In 1887 the first railway across Canada reached the city. The city grew in the 1890s as a gateway to Canada's northwest, where many people were headed for the Klondike gold rush.

During the 1930s Vancouver became western Canada's largest city. During World War II (1939–45) the city was an important shipbuilding center. In 1986 the city celebrated its 100th birthday by holding a world's fair. It was announced in 2003 that Vancouver would be the site of the 2010 Winter Olympics.

► **More to explore**
British Columbia

Van Gogh, Vincent

During his lifetime the Dutch artist Vincent van Gogh sold only one painting. By the end of the 20th century, however, his paintings regularly sold for millions of dollars. He is well known for his vivid and colorful self-portraits, paintings of flowers, and landscapes such as *Starry Night*. Van Gogh worked with great speed and passion, using coarse brushstrokes. He greatly influenced the style of art called expressionism, which shows the emotions that objects and events stir up in the artist.

Vincent Willem van Gogh was born on March 30, 1853, in Zundert, The Netherlands. He trained to be an art dealer. Later he turned to religious studies and did missionary work in Belgium.

Van Gogh did not begin his career as an artist until 1880. In the following 10 years he produced more than 800 oil paintings and 700 drawings. He moved around frequently, painting and studying art in The Netherlands and Belgium. During a stay in Paris, France, he met many modern artists, and his style became less traditional. In 1888 he moved to Arles in southeastern France, where he did some of his best work.

A famous event took place in Arles in 1888. After a quarrel with artist Paul Gauguin, Van Gogh cut off the lower half of his own left ear. Van Gogh spent



Vincent van Gogh painted many pictures of himself. His *Self-Portrait with Straw Hat* was done in about 1887.

much of the rest of his life in and out of mental hospitals. He shot himself on July 27, 1890, and died two days later near Paris.

► More to explore

Painting

Vanilla

Cooks use vanilla as a flavoring in ice cream, cakes, cookies, and many other types of food. Vanilla comes from beans that grow on certain types of orchids in warm parts of the world. Madagascar, Indonesia, and China produce large amounts of vanilla.

An orchid is a type of flowering plant. A vanilla orchid has a long climbing stem that attaches itself to a tree trunk or pole. The plant produces large yellowish flowers. The fruits that develop from these flowers are long pods with seeds inside. People call these pods vanilla beans. The pods may grow to be 8 inches (20 centimeters) long. It can take up to nine months for them to be ready for picking.

A vanilla orchid plant will not produce beans unless its flowers are pollinated, or fertilized. Usually people pollinate vanilla plants by hand. They use a wooden stick to move grains of pollen from the male parts of the flowers to the female parts.

A vanilla bean has no taste or smell until it is processed. Beans are processed by drying and storing them until a chemical change called fermentation



Vanilla beans grow in the form of long pods.

takes place. Fermentation creates crystals of a chemical called vanillin. Vanillin is what gives vanilla its taste and smell.

The processed beans are crushed and mixed with alcohol to extract, or take out, the vanillin and other chemicals. The liquid that results is called vanilla extract. It is used for flavoring.

The Aztec of Mexico flavored their chocolate drinks with vanilla for hundreds of years before the Spanish arrived in their lands in the 1500s. The Spanish learned about vanilla from the Aztec, and they later introduced it to other Europeans. Vanilla soon became a popular flavoring for candy and baked goods. But natural vanilla is expensive to produce. Most vanilla today is made from vanillin that is synthesized, or created artificially, in a factory.

► More to explore

Fermentation • Orchid • Pollen



Vanuatu

The country of Vanuatu is a chain of islands in the southwestern Pacific Ocean. Its capital is Vila, on Éfaté Island.

Geography

Vanuatu is about 1,100 miles (1,800 kilometers) east of Australia. It lies in Melanesia, the western part of the large region called Oceania. The country includes 13 main islands and about 60 smaller ones. The largest island is Espíritu Santo. Many of the islands have mountains with active volcanoes. The climate is hot and rainy.

Plants and Animals

Thick rain forests grow on the islands. The drier regions have patches of grassland. The islands' birds include pigeons, parrots, honeyeaters, and thrushes. Several types of bats also live on the islands.

People

Most of the people in Vanuatu are Melanesians. There are also small groups

of Europeans and people from the nearby area of Polynesia. Christianity is the main religion. Most of the people live in small villages.

More than 100 languages are spoken in Vanuatu. Most people also speak Bislama, a language based on English. English and French are also commonly spoken.

Economy

Farming, fishing, and raising cattle are the main jobs in Vanuatu. Farmers grow coconuts, yams, taro, and other fruits and vegetables. Vanuatu sells dried coconut meat, beef, cocoa, and wood to other countries. Tourism and banking are also important to the economy.

History

Melanesian peoples have lived on the islands of Vanuatu for more than 3,000 years. Europeans explored the islands in the 1600s and 1700s. The British named the islands the New Hebrides, after the Scottish Hebrides island group. British and French settlers arrived in the 1800s. Beginning in 1887 Great Britain and France shared control of the islands.

The New Hebrides gained independence in 1980. The islands' people renamed the country Vanuatu, which means "Our Land Forever."

► More to explore

Oceania • Vila

Facts About VANUATU



Population
(2008 estimate)
233,000

Area
4,707 sq mi
(12,190 sq km)

Capital
Vila

Form of government
Republic

Major towns
Vila (Port-Vila),
Luganville



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Vatican City



Saint Peter's Basilica is one of the largest Catholic churches in the world.

Vatican City is the smallest country in the world. It is the home of the pope, who is the head of the Roman Catholic church. From Vatican City the pope directs the government of the church. Vatican City is also called the Vatican or the Holy See.

Geography

Vatican City sits inside the city of Rome, Italy. Stone walls surround most of Vatican City. Inside the walls are a large church called Saint Peter's Basilica, the Vatican Palace, and other buildings. The Vatican Palace contains the pope's apartments, museums, a library, and the Sistine Chapel. The Sistine Chapel is famous for its ceiling, which has scenes from the Bible that were painted by the artist Michelangelo.

Vatican City also owns many buildings in Rome. In the Alban Hills just south of Rome is Castel Gandolfo, the pope's summer home. In addition, Vatican City

has embassies, called nunciatures, in many capital cities.

People

The pope and hundreds of members of the church's government live and work in Vatican City. Dozens of Swiss Guards, who protect the pope, also live with their families in the city. About 3,000 other people work in Vatican City. Most of those workers live in Rome. Most people speak Italian. The Latin language is used in official documents and in some church services.

Economy

Vatican City's economy is different from the economies of other countries. Roman Catholics around the world give money to their local churches. Vatican City then receives some of that money. The Vatican also sells books, stamps, coins, and souvenirs. Tourists pay to see its museums.

History

Rome became the center of the Roman Catholic church by the 300s. After the 750s the popes controlled much of central Italy. That area was called the Papal States. In 1870 the government of Italy took over the last of the church's lands. In 1929 the Italian government agreed to let Vatican City become an independent country.

► More to explore

Michelangelo • Pope • Roman Catholicism • Rome



Facts About VATICAN CITY



Population
(2008 estimate)
930

Area
109 acres (44 hectares)

Form of government
Commission of five leaders of the Roman Catholic church led by a Secretariat of State

Veda



Brahma was a major god of Hinduism. He was often shown holding a number of objects, including the sacred Hindu text called the Rigveda.

The ancient sacred texts of Hinduism are called the Veda, which means “knowledge.” Hindus composed these texts in what is now India over hundreds of years, beginning in about 1500 BC. For a long time they passed down the texts of the Veda by reciting them. Eventually they wrote the texts down. Hindus today still study the Veda.

The earliest parts of the Veda are four collections of hymns (songs and poems) known as the Vedas. The first, the Rigveda, contains more than 1,000 hymns about Hindu gods and rituals. The Yajurveda helped priests follow these rituals. The Samaveda contains verses that priests chanted or sang. The Atharvaveda includes magic spells and

rituals. It differs from the other Vedas because it is based more on everyday religious ideas than on the lives of the gods.

The Veda also includes the Brahmanas, the Aranyakas, and the Upanishads. These texts comment on the earlier Vedas. They explain the importance and deeper meanings of Hindu rituals and beliefs.

► More to explore

Hinduism • India

Vegetable

Vegetables are the leaves, stems, roots, or other parts of certain plants that people eat. Vegetables usually come from herbaceous plants. Herbaceous plants have stems that are softer than the woody stems of bushes and trees.



Shoppers at a farmers' market choose from a variety of fresh vegetables.

Many vegetables grow aboveground. Lettuce, spinach, brussels sprouts, and cabbage are the leaves of plants. Asparagus spears are stems. Broccoli, cauliflower, and artichokes are flowers.

Other vegetables grow underground. Root vegetables are the roots of plants. These include carrots, beets, turnips, radishes, and sweet potatoes. Tubers are a kind of underground stem. Potatoes are the most commonly eaten tuber. Garlic and onions are plant bulbs, which are underground buds.

Some foods that people call vegetables are really fruits. Cucumbers, squashes, eggplants, and pumpkins are all fruits. They contain seeds, while true vegetables do not.

Vegetables are an important part of a healthy diet. They contain water, vitamins, minerals, and fiber. People eat many fresh vegetables raw. They drink the juice of some raw vegetables, especially carrots. People also eat baked, boiled, fried, steamed, and grilled vegetables. They often add vegetables to soups, stews, and casseroles. Most fresh vegetables spoil quickly, but they can be canned or frozen for later use.

► More to explore

Fruit • Leaf • Plant • Root

Velázquez, Diego

Diego Velázquez was one of Spain's greatest painters. He is especially famous for his portraits (pictures of people).



Las Meninas is one of the most famous works by Diego Velázquez. It shows a scene in the artist's own studio in the palace of the king of Spain. The king's 5-year-old daughter has been brought in for a visit. Two older girls—the maids of honor—look after her. Velázquez himself stands at left, holding a paintbrush.

Velázquez was born in 1599 in Seville, a city in southern Spain. At the age of about 12 he went to work as an apprentice, or helper, in an artist's studio.

At first Velázquez painted scenes of everyday life. But in 1623 he became court painter to King Philip IV of Spain. A court painter's job was to make paintings of the royal family and the high officials and nobles of the kingdom. As court painter Velázquez lived in Madrid, the capital of Spain.

Velázquez spent the years between 1629 and 1631 in Italy studying Italian art. He returned and became the Spanish court painter once again.

Velázquez had other duties as well. He went to Italy for a second time in 1649 to buy art for the king's collections. While in Rome he painted a famous picture of Pope Innocent X, the head of the Roman Catholic church.

Back in Madrid, Velázquez painted some of his greatest works, including *Las Meninas* (The Maids of Honor). He died on August 6, 1660.

► More to explore

Painting

Velociraptor

The name *Velociraptor* means “quick plunderer.” This dinosaur was named for its speed when hunting its prey. It belongs to the group of dinosaurs called dromaeosaurs, or “terrible-clawed lizards.” They are also known as raptors.

When and Where *Velociraptor* Lived

Velociraptor lived about 99 to 65 million years ago. Fossil remains of *Velociraptor* have been found in Asia. In Mongolia scientists uncovered the skeleton of a

Velociraptor locked in a battle with a dinosaur called *Protoceratops*. This find presents a picture of the violent struggle for survival during prehistoric times.

Physical Features

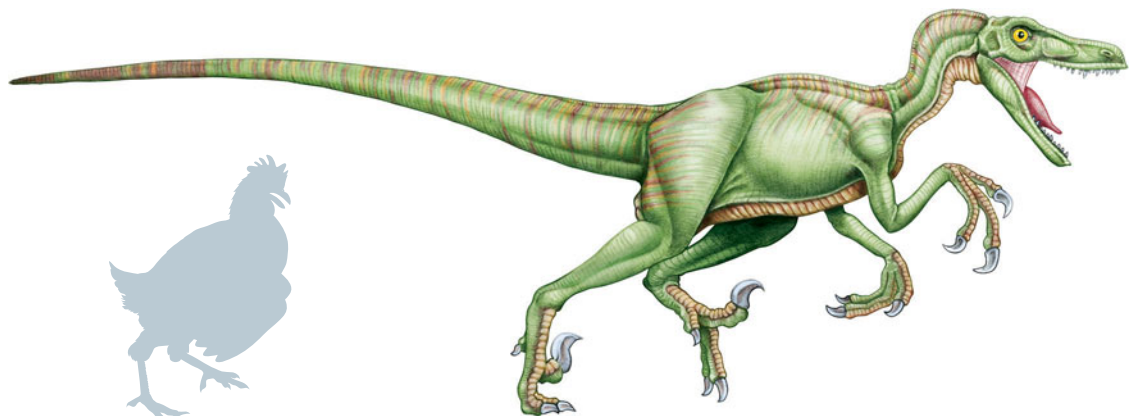
Velociraptor was a small dinosaur that ran on its two back legs. It reached a length of about 6 feet (2 meters) and weighed up to 100 pounds (45 kilograms). The most striking feature of *Velociraptor* was the curved claw on each foot. *Velociraptor* had long, muscular legs and arms. The head of *Velociraptor* was low and long, and its snout was flat. Its jaws contained razor-sharp teeth useful for ripping apart flesh.

Behavior

Velociraptor was a meat-eating dinosaur that often preyed upon smaller animals. Scientists believe that it pounced on its victims from a hiding spot. It then chased them down when they tried to escape. *Velociraptor* hunted in packs to bring down larger dinosaurs as well. It also may have been a scavenger, meaning that it fed upon dead animals.

► More to explore

Dinosaur



Velociraptor was not much taller than a modern chicken.

Venezuela



The water of Angel Falls drops 3,212 feet (979 meters), making it the highest waterfall in the world.

Venezuela is a country on the northern coast of South America. In the 1800s Venezuela led the fight for South America's independence from Spain. The capital of Venezuela is Caracas.

Geography

Venezuela shares borders with Colombia, Brazil, and Guyana. Venezuela claims that western Guyana belongs to it, but Guyana does not agree. The Caribbean Sea lies north of Venezuela, and the Atlantic Ocean lies to the northeast. Some islands in the Caribbean belong to Venezuela.

Both high mountains and low plains run along Venezuela's coast. The Andes Mountains rise in the northwest. Also in the northwest is Lake Maracaibo, the largest lake in South America. The Orinoco River flows through the center of the country. Along the Orinoco is the Llanos, a huge area of grasslands. In the southeast there are rugged highlands and the world's highest waterfall, Angel Falls. Venezuela has a warm climate with rainy and dry seasons.

Plants and Animals

Tropical rain forests grow in parts of Venezuela. Grasslands cover about half of the country. Mangrove trees grow in swampy areas of the coast. The highest parts of the Andes have only shrubs and lichens.

Venezuela's forests are home to jaguars, tapirs, armadillos, deer, monkeys, and





Venezuela is home to many different kinds of birds, including flamingos.

snakes. Turtles, piranhas, and crocodiles live in the country's waters.

People

Most Venezuelans are mestizos, or people with both American Indian and European roots. There are also large groups of whites and blacks. American Indians make up only a small part of the population. Spanish is the main language, but Indian groups speak more than 25 other languages. Most people are Roman Catholics. Almost 90 percent of the people live in cities and towns. Few people live in the area south of the Orinoco River.

Economy

Venezuela's economy is based mainly on the production of oil and natural gas. The country is one of the top oil producers in the world. Venezuela's other minerals include iron ore, coal, bauxite (which is used to make aluminum), gold, and diamonds. Factories produce iron and steel, aluminum, clothing, processed foods, and chemicals. Banking, tourism, and other services are also important to the economy.

Agriculture is a small part of the economy. The main crops include sugarcane, corn, bananas, sorghum, and rice. Cattle raising is common on the grasslands.

History

Arawak and Carib Indians lived in what is now Venezuela when Christopher Columbus reached the coast in 1498. Later European explorers saw houses on stilts that the Indians had built. This reminded them of Venice, the Italian city built on islands. They named the land Venezuela, which means "Little Venice."

The Spanish began settling the area in the 1520s. Spain ruled Venezuela for the next three centuries. In 1811 Venezuelans declared their independence. The Spanish crushed the Venezuelan revolution, but the Venezuelan leader Simón Bolívar continued the fight. His forces defeated the Spanish in 1821.

Venezuela was a part of a country called Gran Colombia until 1829. In 1830 it became an independent country. Military leaders ruled Venezuela for many years. In 1958 Venezuela's navy and air force forced out the military ruler. After that date Venezuela elected presidents to lead the country.

In 2002 army leaders arrested Venezuela's president. However, the president returned to power only two days later.

► More to explore

Bolívar, Simón • Caracas

Facts About VENEZUELA



Population
(2008 estimate)
27,884,000

Area
353,841 sq mi
(916,445 sq km)

Capital
Caracas

Form of government
Republic

Major cities
Caracas, Maracaibo, Valencia, Barquisimeto, Ciudad Guayana

Venice



Population
(2007 estimate)
268,930

The city of Venice is a major center of culture and tourism in Italy, a country in southeastern Europe. It is famous for its beautiful canals, palaces, and art. The city is built on more than 100 small islands. They lie in a body of water called a lagoon at the edge of the Adriatic Sea.

Cityscape

Canals and about 400 bridges link the islands of Venice. People travel through the city by boat or by walking. A type of long, flat-bottomed boat called a gondola is a traditional symbol of Venice. The Grand Canal is like the city's main street.

The Piazza San Marco is the main square in Venice. A magnificent church called the San Marco Basilica is located there. It is famous for its golden domes and the golden tile decorations inside. Also on the square is the Doges' Palace, which was once home to the city's rulers.

Economy

The economy of Venice is based mainly on tourism. In addition, craftspeople from the city sell their famous glass and

lace products to tourists. Trade, ship-building, fishing, and manufacturing also bring money to Venice.

History

People settled the islands of Venice in the 500s. They moved there to escape invaders on the Italian mainland.

A series of dukes, called doges, ruled Venice from the 700s until 1797. It developed into an independent power called a city-state. Venice controlled important trade routes and grew wealthy from sea trade. In the 1200s it began taking over other territories in the region. Venice achieved its greatest power and wealth in the 1400s.

Venice began to decline in the 1500s. It gradually lost the lands of its empire in wars with other powers. Austria took control of Venice in 1797. The city has been part of Italy since 1866.

In modern times air pollution and regular flooding have damaged Venice's great buildings. Also, the islands have



Boats called gondolas gather for a special event on the Grand Canal of Venice, Italy.

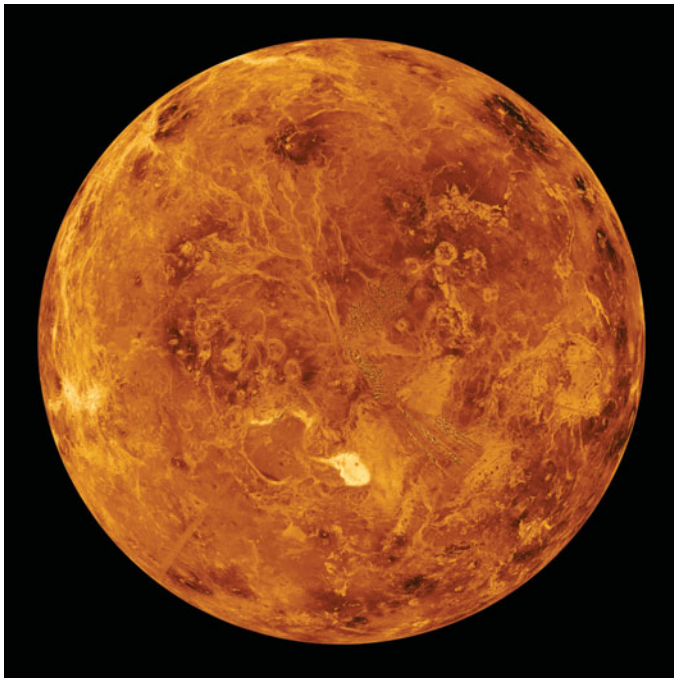
been sinking into the lagoon at an alarming rate. In the 20th century the city began projects to try to control these problems.

► More to explore

Canal • Italy

Venus

Venus is one of the planets that orbit, or travel around, the sun in the solar system. Venus is the brightest planet in the sky when viewed from Earth. It is Earth's nearest neighbor, coming closer to Earth than any other planet. Venus is the second planet from the sun. Its distance from the sun averages about 67 million miles (108 million kilometers). It is the hottest planet in the solar system.



A view of Venus taken by the Magellan spacecraft shows the planet's highest mountain range. It appears as a bright spot near the center of the photograph.

Physical Features

Venus is about the same size and weight as Earth. Its diameter, or distance through its center, is about 7,500 miles (12,100 kilometers). It is solid and rocky. Scientists believe that Venus also has layers like Earth's. These layers consist of a metal core, a thick rocky middle, and a crust.

In the past lava from erupting volcanoes shaped the surface of Venus. Most of the landscape is gently rolling plains. Venus also has tall mountains.

The atmosphere, or layer of gases, surrounding Venus is thick and heavy. Also, thick clouds always cover the planet. The gases and clouds trap heat. The temperature near Venus' surface is about 867° F (464° C). Its surface is hot enough to melt lead.

Orbit and Spin

Like all planets, Venus has two types of motion: orbit and spin. The orbit is the path it takes as it travels around the sun. Venus orbits the sun in a nearly perfect circle. Venus takes 225 Earth days to complete one orbit. In other words, one year on Venus lasts 225 Earth days.

Venus also spins, or rotates about its center. A planet's orbit and spin combine in a complex way to determine the length of a day on that planet. For most planets a day is almost equal to the time it takes to complete one rotation. Venus is unusual in that the length of its day is very different than the time it takes to complete one rotation. The planet takes 243 Earth days to complete one rota-

tion, but a day on Venus lasts only about 117 Earth days. A day on a planet is the time it takes for the sun to appear straight overhead, to set, and then to rise straight overhead again.

Observation and Exploration

People have observed Venus from Earth since ancient times. In addition, more than 20 unmanned spacecraft have visited the planet. The U.S. Mariner 2 spacecraft passed by Venus in 1962. It was the first spacecraft to fly near another planet. In 1970 the Soviet Union's Venera 7 landed on Venus. It was the first spacecraft to successfully land on another planet. In the 1990s the U.S. Magellan spacecraft mapped Venus' surface in great detail. The European Space Agency sent a craft to study Venus' atmosphere in 2005.

► More to explore

Earth • Planets • Solar System • Space Exploration

Venus, goddess

► see Aphrodite.

Venus's-flytrap

The Venus's-flytrap is a plant that traps and eats insects. It belongs to a group of carnivorous, or meat-eating, plants. This group also includes sundews and pitcher plants. The scientific name of the Venus's-flytrap is *Dionaea muscipula*.

In the wild the Venus's-flytrap grows only in parts of North and South Caro-



The Venus's-flytrap has pairs of leaves that look like toothy jaws.

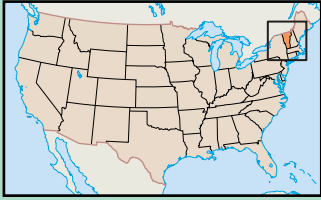
lina, in the United States. It grows best in soil that is damp.

The Venus's-flytrap grows from a bulb-like root. It reaches heights of between 8 and 12 inches (20 to 30 centimeters) and produces small, white flowers. The leaves of the plant grow in rounded halves. The halves are hinged together on one side like jaws. Each half has long spikes along its edge and three hairs on top that are sensitive to touch. The leaf oozes a sticky substance that attracts flies and other insects.

When an insect crawls between the two halves of a leaf, the hairs detect its presence. In less than a second, the leaf snaps shut and the long spikes lock together. The leaf then releases digestive juices that break down the insect into nutrients. The leaf absorbs the nutrients and transports them to all parts of the plant. This process takes about 10 days. Then the leaf reopens.

► More to explore

Pitcher Plant • Plant



Vermont

The U.S. state of Vermont is nicknamed the Green Mountain State. The nickname comes from the state's central geographical feature, the Green Mountains. Vermont's name comes from the French words for "green" and "mountain"—*vert* and *mont*. The state capital is Montpelier.

Geography

Vermont is located in the northeastern corner of the United States in the region known as New England. The state is bordered on the north by the Canadian province of Quebec and on the south by Massachusetts. To the west is New York, which is separated from northwestern Vermont by Lake Champlain. The Connecticut River forms Vermont's border with New Hampshire on the east.



The town of Stowe is a popular destination for tourists to Vermont.

The Green Mountains run down the center of the state and cover most of the land. These heavily forested highlands are part of the Appalachian Mountain range. Winters in Vermont are cold, and summer days are rarely hot. Snowfall can be very heavy, especially in the mountains.

People

The earliest European settlers were Protestants of English heritage. The state remains populated largely by offspring of the original settlers and of later immigrants from Europe and Canada. Vermont's minority groups are very small. African Americans, Asians, Hispanics, and Native Americans together make up only about 3 percent of the population.

Economy

The greatest portion of Vermont's economic earnings come from businesses and organizations that provide services. Some examples of major business ser-

vices are banking and finance, commercial sales, and real estate. Tourism is also an important service industry in Vermont.

Vermont's manufacturers make electronic equipment, metal products, and foodstuffs. Semiconductor chips, a common part in most electronic systems, are produced in Vermont. IBM, one of the world's largest electronics companies, has a manufacturing plant near Burlington. IBM is Vermont's leading employer. Dairying has always been Vermont's main agricultural activity, and the state is a major producer of milk. The ice-cream maker Ben and Jerry's is based in Vermont. Vermont is a national leader in the production of maple syrup and maple sugar.

History

Abnaki Indians lived in the Vermont region before the arrival of Europeans. No permanent European settlement was made until the French built a fort on Isle La Motte in Lake Champlain in 1666. Both the Dutch and the British established settlements in the area in the 1700s. In 1763 the British took control of the area.

During the colonial era both New Hampshire and New York claimed parts of the Vermont region. In 1770 Ethan Allen organized fighters known as the Green Mountain Boys to drive the New Yorkers from the region. In 1777 Vermont declared itself independent of both New Hampshire and New York. Vermont remained independent until it joined the Union in 1791.



Many people ski in the mountains of Vermont.

Vermont remained loyal to the Union during the American Civil War (1861–65). It was the site of the only Civil War action north of Pennsylvania. In 1864 soldiers from the Confederacy raided the town of Saint Albans and robbed its banks.

The farming community suffered as the number of Vermont's farms began to decline after the Civil War. Farms continued to drop in the 1900s. In the 1930s the first ski runs were built in the state. By the 1960s Vermont had a successful winter tourist industry. In the early 21st century hotels, restaurants, and recreational sites were important parts of Vermont's economy.

► **More to explore**
Montpelier

Facts About VERMONT

Flag



Population
(2000 census)
608,827—rank,
49th state; (2008
estimate)
621,270—rank,
49th state

Capital
Montpelier

Area
9,614 sq mi
(24,901 sq km)—
rank, 45th state

Statehood
March 4, 1791

Motto
Freedom and
Unity

State bird
Hermit thrush



State flower
Red clover



Verne, Jules



An illustration from Jules Verne's *Twenty Thousand Leagues Under the Sea* shows Captain Nemo looking at an octopus through a window in his submarine, the *Nautilus*.

The French author Jules Verne is known as one of the first science fiction writers. He wrote more than 50 novels and many short stories.

Verne was born on February 8, 1828, in Nantes, France. He studied law and worked for a while as a stockbroker. But he always considered himself to be a writer. His first play was produced in 1850. His first successful adventure story was *Five Weeks in a Balloon*, which was published in 1863.

Verne studied science to make his stories as believable as possible. He knew so much that he was able to imagine many developments that would soon take place in real life. In his novels and stories

he predicted wonders such as television, airplanes, space travel, and modern submarines.

Verne's most famous adventure novels are probably *Twenty Thousand Leagues Under the Sea* (1870) and *Around the World in Eighty Days* (1873). *Twenty Thousand Leagues Under the Sea* is the story of Captain Nemo, a mysterious wanderer who commands a marvelous submarine. *Around the World in Eighty Days* is the story of Phileas Fogg, an English gentleman who makes a very speedy (for the 1870s) trip to win a bet.

Verne died in Amiens, France, on March 24, 1905. His works were translated into many languages and continue to be popular. Several successful movies were made from his works.

► More to explore

Science Fiction

Verrazzano, Giovanni da

Giovanni da Verrazzano was an Italian explorer who worked for the French government. He explored the Atlantic coast of what is now the United States. He was the first European to see New York Bay.

Verrazzano was born near Florence, Italy. As an adult he moved to France. Then he went to sea on French ships. He made several trips to the Middle East.

In 1524 Verrazzano commanded a ship that went across the Atlantic Ocean. Like many other European explorers, he was looking for something that did not exist—a short route to Asia. He landed at Cape Fear, which is now in North Carolina. He first went south but soon turned north because he did not want to meet the Spanish.

Verrazzano soon found New York Bay. He sailed by a narrow waterway that separated two parts of New York that are now called Long Island and Staten Island. Verrazzano then explored what is now Rhode Island and met Native Americans. He continued all the way to Newfoundland before returning home. He claimed everything he saw for France. The French later made colonies in the northern part of the lands he claimed.

Verrazzano later made two more trips to the Americas. In 1527 he commanded ships that went to South America. He returned with a cargo of valuable wood. In 1528 Verrazzano made a trip to Florida, the Bahamas, and finally the islands of the Caribbean Sea. His trip ended when he was captured and killed by the Carib people.

The Verrazano-Narrows Bridge, which spans part of New York Bay, was named for the explorer. The bridge uses a different spelling of Verrazzano's name.

► More to explore

Americas, Exploration and Settlement of the

Versailles

Versailles is a city in France. It is about 14 miles (22 kilometers) southwest of Paris. Versailles is famous for a palace built in the 1600s under the guidance of King Louis XIV. The Palace of Versailles was one of the most costly and extravagant buildings in the world. French kings lived there for more than 100 years.

Versailles was not even a town when King Louis XIII built a hunting lodge there in the 1630s. The expansion of the lodge into the palace began in the 1660s. Construction went on through the next century. When the building was completed, about 5,000 people lived there. Other buildings on the palace grounds include the Grand Trianon and the Petit (Small) Trianon. They were built as private residences for the royal family and special guests.

The town of Versailles grew around the palace. It was founded in 1671. Many of the first residents were people who had



The Palace of Versailles is known for its extensive gardens as well as its grand buildings.

come to work on the palace. When Louis XIV died in 1715, after 72 years as king, the town of Versailles had a population of 30,000.

The Palace of Versailles was used as the royal residence until the French Revolution started in 1789. After the revolution, the palace was nearly destroyed. In 1837 King Louis-Philippe restored it and turned it into a museum.

► More to explore

France

Vertebrate

A vertebrate is an animal with a backbone. (An invertebrate is an animal without a backbone.) Fishes, amphibians, reptiles, birds, and mammals, including humans, are all vertebrates.

Vertebrates share some basic characteristics. A hollow backbone and the cranium, or skull, protect the spinal cord and brain of most vertebrates. All vertebrates reproduce by mating between males and females.

Fish are the oldest known vertebrates. Most fish have a bony skeleton. However, sharks and rays have a skeleton made of cartilage, a strong and flexible tissue. Fish gradually evolved, or changed, into land animals.

Mammals are the most complex kind of vertebrate. They feed their babies with milk from the mother, they develop inside their mother's body, and they have hair. Their highly developed brains

make them more intelligent than other groups of animals.

Vespucci, Amerigo



The name of America appeared for the first time on a map made in 1507. The map showed the lands that Amerigo Vespucci had visited in the New World.

Amerigo Vespucci was an explorer from Europe. The Americas are named for him though he was not the first European to visit North or South America. He crossed the Atlantic Ocean several years after Christopher Columbus made his first voyage of discovery.

Vespucci was born in 1454 in Florence, Italy. In 1491 he went to live in Spain. There he worked for a company that helped people prepare ships for voyages. Through his work he met Columbus. He helped to gather supplies for the second and third voyages of Columbus.

In about 1499 Vespucci himself set sail on a Spanish ship. He was the

Did You Know?

Vertebrates with two pairs of limbs are called tetrapods. Limbs include legs, arms, wings, and flippers.

navigator, or the person who found the way. He explored the northeastern coast of South America and then returned to Spain.

In 1501 Vespucci sailed again, this time on a Portuguese ship. He explored the southeastern coast of South America.

When he got back to Europe, Vespucci wrote about his travels. Unlike Columbus, he did not think he had been to Asia. Instead he described the places he had seen as a “New World.”

A German mapmaker named Martin Waldseemüller read Vespucci’s writings. In 1507 Waldseemüller made a world map and labeled South America as “America.” (Vespucci’s first name was also spelled Americus.) Later mapmakers used “America” for North America and Central America as well, even though Vespucci had never been to either place.

After he stopped traveling Vespucci went to work for the Spanish government. He helped to prepare the official map of

newly discovered lands and of the routes to them. He died in 1512 in Spain.

► More to explore

Americas, Exploration and Settlement of the • Columbus, Christopher

Vesuvius, Mount



Mount Vesuvius is an active volcano in southern Italy. It is famous for an eruption that happened in AD 79. Thousands of people died when lava, ashes, and mud buried the cities of Pompeii, Herculaneum, and Stabiae. The cities were forgotten until archaeologists began digging up their ruins in the 1700s.



Mount Vesuvius towers over the ruins of the ancient city of Pompeii, in southern Italy. An eruption of Vesuvius buried Pompeii in AD 79, but workers have uncovered much of the city.

Mount Vesuvius stands about 4,200 feet (1,280 meters) high, but its height changes after each major eruption. A high ridge known as Mount Somma partly surrounds the main cone of Vesuvius. The area between the ridge and the cone is known as Valle del Gigante (Giant's Valley). At the top of the cone is a large crater. It is about 1,000 feet (300 meters) deep and 2,000 feet (600 meters) across.

Scientists believe that Mount Vesuvius was formed about 200,000 years ago. Vesuvius was inactive for hundreds of years before the disaster of AD 79. Since then the volcano has erupted many times. An eruption in 1631 killed about 3,000 people. The last major eruption occurred in 1944.

► More to explore

Italy • Pompeii • Volcano

Veterans Day

Every year on November 11, people in the United States celebrate Veterans Day. The holiday honors veterans, or people who served in the U.S. military. The day especially honors those veterans who died while fighting in a war.

To celebrate Veterans Day, some cities and towns have parades. Veterans from the area may march in the parades. Sometimes people visit cemeteries on Veterans Day. People may put flowers or flags on the graves of veterans to honor them.



A veteran of World War II (1939–45) wears his uniform and medals at a U.S. Veterans Day ceremony.

Before it got the name of Veterans Day, November 11 was called Armistice Day. November 11, 1918, was the day of the armistice (agreement to stop fighting) that ended World War I.

The United States celebrated the first Armistice Day in 1919. Armistice Day became an official holiday in 1938. U.S. forces later fought in World War II (1939–45) and the Korean War (1950–53). In 1954 Armistice Day was renamed Veterans Day to honor veterans of all wars.

People in Australia, Canada, France, and the United Kingdom also honor veterans on a day in November. Canada and

Did You Know?

In many countries of the world a red flower called a poppy is a symbol of the veterans who died in wars.

the United Kingdom call the holiday Remembrance Day. On November 11, people across Europe remember the end of World War I.

► More to explore

War • World War I

Veterinary Medicine

Veterinarians, or veterinary surgeons, are animal doctors. A veterinarian's job is to keep animals healthy and to treat them when they get sick. This branch of medicine is called veterinary medicine, or veterinary science.

People go to school to become veterinarians. They must earn a degree called a doctor of veterinary medicine. This takes at least four years. Veterinarians can specialize in different areas. For example, some only take care of pets.

Before they can treat animals, veterinarians must pass a state test. They then



Veterinarians at zoos care for a wide range of animals.

decide where they want to work. Many veterinarians work in hospitals or clinics. Others start their own business, or practice.

Many people think of veterinarians as pet doctors. But veterinarians are also very important to zoos and farms. Farmers can go out of business if a disease kills many of their animals. Veterinarians try to keep the animals free from disease. They also help the animals breed and give birth. They do the same things for zoo animals. This is especially important since many endangered animals live in zoos.

Not all veterinarians treat animals. Some teach veterinary medicine. Others conduct research. They look for better medicines. In addition, a number of veterinarians try to control animal diseases that can spread to humans.

Pet owners can help keep their pets healthy by taking them to a veterinarian for regular checkups.

Veterinary medicine may have begun as early as 2000 BC in Babylonia (present-



day Iraq) and Egypt. In the Middle Ages (AD 500–1500) veterinary medicine practically disappeared. Then in the 1700s a disease killed herds of cattle in Europe. To prevent this from happening again, colleges of veterinary medicine were created in Europe. Soon they were found all over the world.

Viburnum



Viburnum flowers grow in round clusters, or groups, that sometimes look like snowballs.

Viburnums are shrubs and small trees that are often planted in parks and gardens. Most have showy flowers and colorful fruits.

There are 200 species, or types, of viburnum. Plant scientists place them in the honeysuckle family of plants. They can be found in Europe, Asia, and North America. Viburnums grow in areas that have mild or subtropical weather.

The flowers of viburnums are often white and have a sweet smell. They usually grow in clusters, or groups. These

clusters can be so large that they look like snowballs. Two popular types of viburnum are the Chinese snowball and the Japanese snowball.

Most viburnums have blue-black fruit. Their leaves come in many shapes. A type of viburnum called the black haw has plumlike leaves. The sheepberry has oval leaves.

Viburnums vary in height. The American wayfaring tree grows up to 10 feet (3 meters) tall. The wayfaring tree of Europe reaches a height of 16 feet (5 meters).

Victoria, Queen

Queen Victoria was queen of the United Kingdom from 1837 to 1901. She reigned over her country longer than any other British king or queen before her. Her reign is called the Victorian Age.



Queen Victoria

Early Life

Alexandrina Victoria was born on May 24, 1819, in London, England, the capital of the United Kingdom. Her father was a son of King George III. Her mother was a German princess.

Reign

Victoria became queen in 1837. She was 18 years old. The young queen learned about the British government from Lord Melbourne, the British prime minister (head of government).

In 1840 Victoria married her cousin Prince Albert of Saxe-Coburg-Gotha. They had nine children together. Almost all of them married members of European royal families.

Albert died in 1861. Victoria was never really happy after that. She stopped going to places where people could see her. She spent less and less time in London and more and more time in a castle in Scotland called Balmoral.

Then another prime minister, named Benjamin Disraeli, became Victoria's friend. Disraeli pleased Victoria in 1876 by making the British government a part owner of the Suez Canal. The canal was an important link between Europe and Asia. Disraeli pleased Victoria even more by giving her the title of empress of India in 1876.

Later Years

As the years passed, Victoria kept her popularity. In 1887 the British people had a big celebration called the Golden

Jubilee to honor her 50 years as queen. Ten years later they had another big celebration called the Diamond Jubilee.

On January 22, 1901, Victoria died at age 81 on the Isle of Wight, an island in the English Channel. Her son Edward VII then became king.

► More to explore

George III • United Kingdom

Victoria



Victoria is the second smallest of Australia's six states. Only the island state of Tasmania is smaller. But Victoria is the second largest state in population. Only New South Wales has more people. Victoria's capital is Melbourne.

Geography

Victoria lies in the southeastern corner of Australia. It shares borders with New South Wales on the north and South Australia on the west. The Pacific Ocean lies to the east. The Tasman Sea and the Antarctic Ocean lie to the south. Victo-

ria's area is 87,806 square miles (227,416 square kilometers).

The Murray River runs along most of Victoria's border with New South Wales. Mountains rise in the northeast and in the center of the state. Mount Bogong, at 6,516 feet (1,986 metres), is the highest point. Flat plains lie north, west, and south of the mountains. Sandy deserts are found in the west.

People

About 5 million people live in Victoria. Most people can trace their roots to Great Britain. Some have other European or Asian roots. About one quarter of Victoria's people were born outside Australia. A small number of Aborigines, or native Australians, also live in Victoria.

Melbourne is the largest city in Victoria and the second largest city in Australia.



The unusual rock formations off the coast of Victoria, Australia, are called sea stacks. They were formed over thousands of years by the water washing away at the stone. The process continues, and in 2005 one of the rocks collapsed into the water.

It has a population of more than 3 million. Melbourne is a port, an industrial city, and the cultural center of Victoria. It lies on the southern coast of the state.

Economy

Victoria has one of the strongest economies in Australia. Many people work in manufacturing. Factories produce machines, vehicles, clothing, and paper. Many other people of Victoria work in services—for example, banking, communications, and tourism.

The state's farmers grow wheat, broccoli, brussels sprouts, celery, cauliflower, lettuce, and potatoes. Sheep and cattle ranchers produce wool and beef products. Victoria's mineral resources include coal, oil, and natural gas.

History

Aborigines first settled in what is now Victoria at least 40,000 years ago. In 1770 the British explorer James Cook became the first European to visit the region. At that time between 15,000 and 20,000 Aborigines lived there.

In the 1830s Europeans started to settle in the area. The land was then a part of the British colony of New South Wales. The Europeans fought wars with the Aborigines. By 1850 only about 3,500 Aborigines were left in the region.

By 1850 Victoria had about 76,000 people, mainly farmers and sheep herders. Victoria became a separate colony of Great Britain in 1851. The discovery of gold in that year soon brought many

more people. More than 200,000 came from Britain, and another 25,000 came from China.

In 1855 Victoria set up its own government. In 1901 Australia gained independence from Britain. Victoria then became a state of Australia.

► More to explore

Aboriginal Peoples • Australia • New South Wales

Victoria



Population
(2004 estimate)
23,200

Victoria is the capital of Seychelles, an island country in the Indian Ocean. The town lies on the coast of Mahé Island, the country's largest island. It is the only major town in Seychelles.

Victoria is Seychelles' business center and port. Shipping goods through the port is important to the town's economy. Tourism also brings money to Victoria.

The French built the first permanent settlements on the islands of Seychelles in the 1700s. Great Britain took control of the islands in the early 1800s. In 1841 the British named the islands'



British colonists built a clock tower in the center of Victoria, Seychelles. They wanted it to look like a clock tower they knew in London, England.

capital Victoria in honor of Queen Victoria of Britain. Seychelles became an independent country in 1976. Victoria was its capital.

► More to explore

Seychelles

Victoria, Lake

Lake Victoria is the largest lake in Africa. It is also the second largest freshwater lake in the world. The lake lies mainly in the countries of Tanzania and Uganda. It also borders on Kenya.

Lake Victoria has an area of 26,828 square miles (69,484 square kilometers). Several rivers flow into the lake. The most important is the Kagera River. The lake's only outlet is the Victoria Nile, which is the beginning of the Nile River. Many islands are in Lake Victoria. The



The sun sets behind one of the many islands in Lake Victoria.

largest is Ukerewe. The island has hills 650 feet (200 meters) high.

More than 200 species of fish are found in Lake Victoria. Fishing is important to the local economies. Several million people live in the area around the lake.

In 1858 a British explorer named John Hanning Speke saw the lake while searching for the source of the Nile River. He named it Lake Victoria after Queen Victoria of England.

► More to explore

Lake • Nile River

Video Games

► see Electronic Games.

Video Recording

Video recording is a way of storing television programs and other moving images along with sound. Video recording is used to record TV programs for later broadcast. Video recording also

gives viewers the ability to save a TV program and watch it whenever they want to.

Thousands of movies are available in the form of video recordings, too. They can be viewed on a TV set or a computer screen. And many people make their own movies using portable video cameras called camcorders.

How Video Recording Works

Video cameras such as TV cameras create electric signals that represent pictures (video) and sound (audio). A TV set receives these signals and uses them to reproduce the pictures and sound that the camera recorded.

Home video-recording devices allow people to record video and audio signals. One such device is the videocassette



Tourists use camcorders to record interesting animals, people, or events that they observe during their travels.

recorder, or VCR. It changes the signals into patterns of magnetic particles on a plastic tape. The tape is stored in a case called a videocassette. VCRs can also play recorded videocassettes. They read the magnetic patterns on the tape and re-create the recorded electric signals.

Digital video-recording devices store video and audio signals as a number code. DVD recorders store the number code on plastic discs called digital video-discs, or DVDs. The code is recorded on the disc as a series of tiny pits, or holes, arranged along narrow tracks. A DVD player uses a laser to read the code and turn it back into pictures and sound. A digital video recorder (DVR) stores the number code on a metal disk inside a device called a hard drive. Unlike other video-recording devices, a DVR can show a TV program even while it is still being recorded.

History

The first successful videotape recorder was introduced in 1956. It was very expensive and was used mainly by TV broadcasters. From then on, recorded TV shows almost completely replaced live broadcasts. VCRs became common in homes starting in the 1970s. Camcorders that used videotape appeared in the early 1980s.

Digital video recording is a newer technology. DVDs and digital camcorders were introduced in the mid-1990s. Recordable DVDs and DVRs appeared a few years later. By the early 21st cen-

tury DVDs had mostly replaced videocassettes.

► More to explore

Camera • Laser • Movie • Television

Vienna



Population
(2007
estimate), city,
1,664,150;
urban area,
1,954,960

Vienna is the capital of Austria, a country in central Europe. The city lies on the Danube River. It is Austria's largest city. It is also the country's center of industry, trade, and, especially, culture.

For centuries Vienna has been one of the world capitals of music. Operas and classical music concerts have played a major part in city life. Many great composers—including Ludwig van Beethoven, Wolfgang Amadeus Mozart, and Johannes Brahms—have lived in Vienna. The city is home to a world-famous orchestra, opera house, and boys' choir.

Vienna is famous for its palaces and other grand buildings. The Hofburg is a large group of buildings that originally housed Austria's royal family. One of its buildings now houses the Spanish Riding School and its performing horses of the Lipizzaner breed.



The Schönbrunn Palace near Vienna was once the summer home of the Hapsburg family. The Hapsburgs were the ruling family of Vienna and Austria for many years.

Economy

The economy of Vienna is based on manufacturing and services such as trade, banking, and tourism. Many people in the city work for the government. Factories in Vienna make car parts, electrical machinery, and chemicals. Vienna also has many companies that develop medical



In addition to its music and history, Vienna is known for its many coffeehouses. Tourists and local people alike go to the coffeehouses to eat, drink, read, or visit with friends.

products, software, and other high-technology products.

History

Celtic peoples settled in the Vienna area in ancient times. In the 1st century AD the Romans established a military post at the site. Different groups later controlled Vienna.

Vienna was the capital of the Hapsburg family from the late 1200s until the early 1900s. The Hapsburgs ruled the Austria area as part of a series of powerful empires. Vienna was their capital. During their rule Vienna became one of the world's great cities.

The Ottoman Turks attacked Vienna in 1529 and again in 1683. They were defeated both times.

Hapsburg rule ended in 1918. Vienna then became the capital of the new country of Austria.

German troops captured Austria in 1938. During World War II Vienna was often bombed. Foreign troops controlled the city from 1945 to 1955.

Since then Vienna has again become an important city. It is one of the headquarters of the United Nations and other international organizations. Vienna's culture and architecture continue to attract tourists from all over the world.

► More to explore

Austria • Classical Music • Hapsburgs
• Opera

Vientiane



Population
(2003
estimate), city,
194,200;
(2005
estimate), urban
area, 702,000

Vientiane is the capital of Laos, a country in Southeast Asia. It is the country's largest city by far. It lies on the Mekong River, which is a major transportation route. Vientiane is the main port for shipping goods into Laos.

Laos is a poor country with little industry. Vientiane is the country's center of business. It is also one of the main

manufacturing areas. Tourism is also slowly becoming part of Vientiane's economy.

Vientiane was founded in the late 1200s. It became the capital of the Lao kingdom in the 1500s. In 1778 Siam—which is now the country of Thailand—took control of Vientiane.

France controlled Laos from the late 1800s until the 1950s. Vientiane was the capital of Laos during French rule. In the 1950s France's colonies in Asia fought for independence. Many groups also fought for control of Vientiane. In 1954 Laos became an independent country. Vientiane remained its capital.

► More to explore

Laos • Mekong River



That Luang is a Buddhist religious building in Vientiane, Laos.



Vietnam

The Asian country of Vietnam split into northern and southern parts in 1954. After the long Vietnam War, the two parts of Vietnam reunited in 1976. Vietnam's capital is Hanoi.

Geography

Vietnam is a long, narrow country in Southeast Asia. It shares borders with China, Laos, and Cambodia. The South China Sea lies to the east and south. The Gulf of Tonkin lies to the northeast, and the Gulf of Thailand is to the southwest.

Mountains cover about two thirds of the land, especially in the north. The Mekong River forms a delta, or triangle of rich land, in the south.

Vietnam has a warm, rainy climate. Storms called typhoons (like hurricanes) sometimes strike during the warmest seasons.



People live in houseboats on the Gulf of Tonkin in northern Vietnam.

Plants and Animals

Forests of oak, beech, pine, teak, and ebony trees cover about a third of the land. Bamboo plants grow in many places. Mangrove trees grow along the coast.

Deer, elephants, tigers, leopards, bears, and monkeys live in the forests. Vietnam also has crocodiles, boars, jackals, otters, skunks, and flying squirrels.

People

Most of the people are Vietnamese. Chinese and Hmong peoples form small groups in the north. In the south there are small groups of Khmer (or Cambodians) and Cham. Many other small groups live in the mountains.

The country's main language is Vietnamese. Many people also speak Chinese, Khmer, English, French, or a local language. Buddhism is the major religion. Vietnamese religions and Chris-

tianity are also common. Most of the people live in villages in the river deltas.

Economy

Most of Vietnam's workers are farmers. The most important crop is rice. Other food crops include cassava, corn, sweet potatoes, and peanuts. Farmers also grow sugarcane, coffee, tea, and rubber trees. They raise ducks, pigs, cattle, and buffalo.

Vietnam's factories make food products, clothing, shoes, cement, chemicals, steel, and electronics. Vietnam also produces coal, oil, and other minerals.

History

The first Vietnamese lived in a kingdom called Nam Viet beginning in 207 BC. China soon conquered Nam Viet. The Vietnamese gained independence from China in AD 939.

French Rule

France invaded the region in the 1800s. By 1883 the French controlled all of

Vietnam. France later combined Vietnam, Cambodia, and Laos into one territory called French Indochina.

After World War II a Communist group called the Viet Minh took control of northern Vietnam. In 1946 a war broke out between the French and the Viet Minh. The Viet Minh won the war in 1954.

Vietnam War

Vietnam was then divided into two parts. North Vietnam set up a Communist government. A president with strong powers ruled South Vietnam.

Communist rebels called the Viet Cong soon began fighting the government of South Vietnam. North Vietnam supported the rebels. The United States supported South Vietnam. In 1965 the United States began bombing North Vietnam. It also sent U.S. soldiers into the south. However, the United States could not defeat the Communists. Communist forces took over South Vietnam by 1975.

Recent History

North and South Vietnam joined together in 1976. In 1978 Vietnam attacked Cambodia. Vietnam's actions led to trouble with China and other countries. Vietnamese forces finally left Cambodia in 1989. Vietnam's relationships with other countries then began to improve.

► More to explore

Communism • Hanoi • Mekong River
• Vietnam War

Facts About VIETNAM



Population
(2008 estimate)
88,537,000

Area
128,379 sq mi
(332,501 sq km)

Capital
Hanoi

Form of government
Socialist republic

Major cities
Ho Chi Minh City,
Hanoi, Haiphong,
Da Nang, Bien
Hoa



Farming is very important to Vietnam's economy. Some farmers sell fruit from baskets on their bicycles.

Vietnam War

The Vietnam War was a long conflict in Southeast Asia. It began in 1954, after the country of Vietnam was split into two parts, North Vietnam and South Vietnam. North Vietnam wanted to reunite the country under Communism, its political and economic system. South Vietnam fought to keep this from happening. The United States helped South Vietnam, but North Vietnam won the war in 1975. Soon Vietnam was a united, Communist country.

The Vietnam War had a huge cost in human lives. More than 1.3 million Vietnamese soldiers and about 58,000 U.S. troops were killed. More than 2 million civilians (people not fighting the war) also died.

Background

Vietnam had many troubles before the Vietnam War. In the early 1900s the country was part of a French colony. Japan seized the colony in 1940 and

held it until 1945. Then a Vietnamese group called the Viet Minh declared Vietnam's independence. But the French still wanted to rule Vietnam as a colony. The two sides fought an eight-year war, called the French Indochina War. The Viet Minh defeated the French in 1954.

France and the Viet Minh then took part in a meeting to decide what would happen to Vietnam. People from the United States, the Soviet Union, and several other countries also participated. The meeting divided Vietnam into North and South Vietnam. The Viet Minh got control of North Vietnam. A Communist named Ho Chi Minh was the president. The Vietnamese who had supported the French got control of South Vietnam. Ngo Dinh Diem, who opposed Communism, led the south. The French soon left the country.

Civil War

By 1957 Communist rebels in South Vietnam had begun fighting Diem's government. They were called the Viet Cong. The Viet Cong hid by day and attacked by night. The North Vietnamese army trained and supported the Viet Cong. Communist fighters from the north later joined the fighting themselves.

The United States supported Diem because U.S. leaders hated Communism. U.S. military advisers trained the South Vietnamese army. Nevertheless, the Viet Cong seized control of much of South Vietnam in the early 1960s.



The Vietnam Veterans Memorial is in Washington, D.C. It includes a wall with the names of U.S. soldiers who died or were missing because of the Vietnam War.



U.S. Marines wade through a marsh during the Vietnam War.

Meanwhile Diem was losing support among the South Vietnamese people. One reason was his harsh treatment of followers of the Buddhist religion. Most Vietnamese were Buddhist, but Diem was a Roman Catholic. Diem imprisoned and killed hundreds of Buddhists. More and more people turned against him. In 1963 members of the South Vietnamese army murdered Diem. A group of army officers took over the government.

More U.S. Troops Arrive

The United States continued to help South Vietnam. In August 1964 the North Vietnamese attacked a U.S. warship in a waterway called the Gulf of Tonkin. Afterward the U.S. Congress gave President Lyndon B. Johnson the power to expand the U.S. role in the Vietnam War.

By 1968 the United States had more than 500,000 troops in Vietnam. Small units from South Korea, Australia, New Zealand, Thailand, and the Philippines also helped the South Vietnamese. The

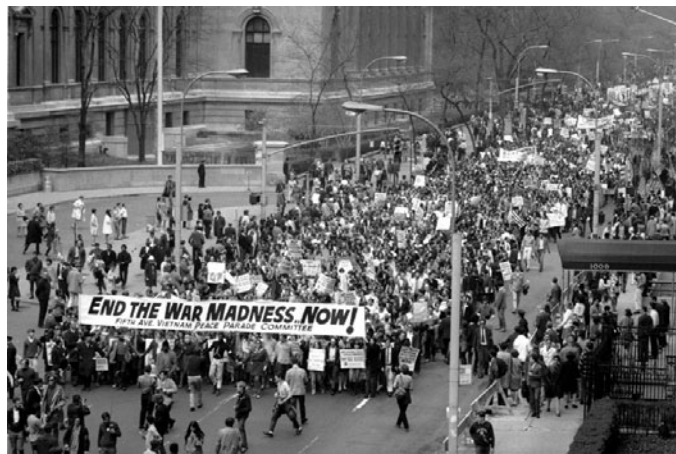
Communist governments of the Soviet Union and China supported North Vietnam and the Viet Cong.

U.S. warplanes dropped bombs on highways and bridges in North Vietnam. The United States also bombed the Ho Chi Minh Trail, a Viet Cong supply road in Laos and Cambodia. Soon U.S. bombers were striking Hanoi and other North Vietnamese cities.

In February 1968, during a Vietnamese holiday called Tet, the Communists attacked about 30 cities in South Vietnam. The Viet Cong suffered heavy losses in these battles. But many U.S. soldiers died, too. Some people in the United States started to think that the war could not be won. Other people protested the war.

U.S. Troops Leave Vietnam

In 1968 President Johnson gradually ended the bombing of North Vietnam. Peace talks began. In 1969 Richard M. Nixon became president. Nixon began



People march in New York City in 1968 to protest the Vietnam War. Many Americans were against the war. They participated in protests and demonstrations.

to remove U.S. troops from Vietnam. But he also started bombing North Vietnam again, and he expanded the war to neighboring countries. U.S. and South Vietnamese troops attacked North Vietnamese and Viet Cong hiding places in Cambodia and Laos.

In January 1973 North and South Vietnam, the Viet Cong, and the United States signed an agreement to stop fighting. The United States then removed almost all its troops from Vietnam. But the war did not end. The United States continued to give money and equipment to South Vietnam.

The War Ends

In August 1974 the United States cut back its military aid to the south. The South Vietnamese army fell apart quickly after that. In 1975 the North Vietnamese launched a massive invasion of South Vietnam. North Vietnamese troops entered Saigon, the capital of South Vietnam, on April 30, 1975. The war was over, and the Communists had won. Thousands of South Vietnamese people fled the country.

In 1976 the Communists combined North and South Vietnam into one country, called Vietnam. They made Hanoi the capital. They renamed Saigon as Ho Chi Minh City in honor of Ho, who had died in 1969.

► More to explore

Communism • Ho Chi Minh
• Johnson, Lyndon B. • Nixon, Richard M. • Vietnam

Vikings



A picture from a handwritten book shows the Vikings in their ships. They are preparing to attack the island of Great Britain.

The Vikings, who are also called Norsemen or Northmen, were warriors from northern Europe. They sailed the seas from the late 700s to the 1000s. They attacked many countries and took away much treasure. Their northern European neighbors gave them the name of Viking, which means “pirate.”

People

The homeland of the Vikings was in the region that is now called Scandinavia. The region now contains the modern countries of Denmark, Norway, and Sweden. Vikings also settled peacefully on Iceland, Greenland, and other islands in the North Atlantic Ocean. At home the Vikings were farmers. They belonged to clans, or large families, and were ruled by chiefs.

Did You Know?

The U.S. government sometimes used the term Vietnam Conflict instead of Vietnam War because the United States never officially declared war.

The Vikings were good sailors. They sailed in ships called longships. Rowers and sails moved the longships across the seas. In about 1000 a Viking named Leif Eriksson sailed all the way to North America.

The Vikings also were fierce warriors. The gods they worshipped were warriors, too. Their chief god was called Odin. Odin ruled over a warrior heaven called Valhalla.

The Vikings buried their chiefs with the supplies they thought they would need to get to Valhalla—tools, weapons, and even boats. Modern scientists have learned much about Viking life by opening Viking graves.

Writings called sagas provide even more information about Vikings. Sagas are Viking stories that Icelanders wrote down in the 1100s and 1200s.

Conquests

Vikings first attacked England in the late 700s. In 865 a Viking group from Denmark called the Danes conquered several

English kingdoms. The English drove out the Danes in 954, but the Danes soon returned. The Danish king Canute I ruled England from 1016 to 1035 as a part of his Viking empire. England finally threw off Danish rule in 1042.

However, in 1066 the Normans conquered England. The Normans were descendants of Vikings who had settled in France. The name Norman means “Northman.”

Vikings first attacked Ireland in 795. They started several kingdoms there. They threatened all of Ireland until 1014, when the Irish beat them in the battle of Clontarf.

Some Vikings roamed eastward. They attacked and looted the coasts of the Baltic Sea. After invading Russia, they moved far inland and mixed with the native people. The name of Russia comes from a Viking word.

After the 1000s the Vikings were no longer an independent group of warriors. Some mixed with the peoples of the lands that they conquered. Others settled down in their homelands. Eventually they also became Christians.

► More to explore

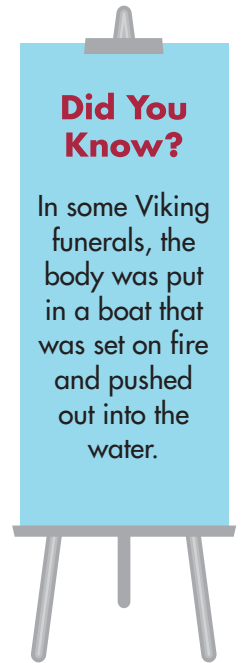
Denmark • Leif Eriksson • Norway
• Sweden

Vila

Vila is the capital of Vanuatu, an island country in the Pacific Ocean. The town is on Éfaté Island. Vila is a small town,

Did You Know?

In some Viking funerals, the body was put in a boat that was set on fire and pushed out into the water.



A Viking burial ship is on display in a museum in Oslo, Norway.



Vila, the capital of Vanuatu, is on the coast of Éfaté Island. A small island called Iririki sits in Vila's harbor.

but it is the largest town in Vanuatu. It is also one of the country's main ports. The town is also called Port-Vila.

Tourism, banking, and other service industries are important to Vila's economy. The town is Vanuatu's center of trade.

Melanesian peoples have lived on the islands of Vanuatu for thousands of years. In the 1880s the French and British together took control of the islands. In the 1940s, during World War II, the U.S. Navy used Vila's harbor as a base. U.S. troops built many roads and buildings in the town. In 1980 Vanuatu became an independent country. Vila was made the capital.

► More to explore

Vanuatu

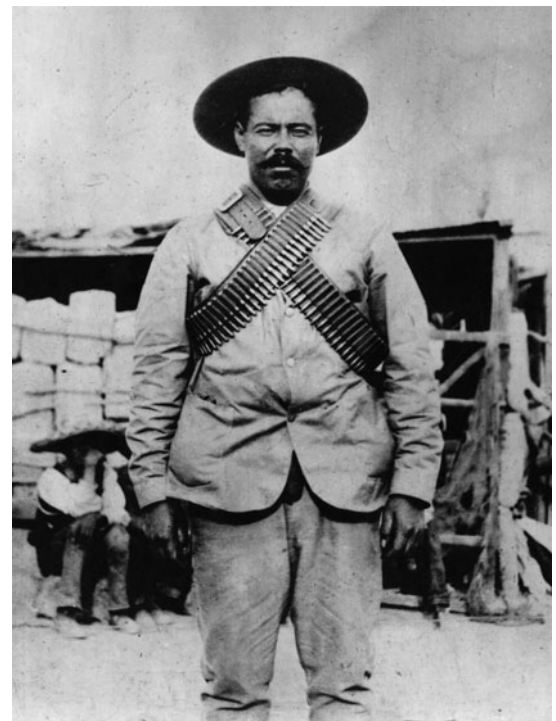
Villa, Pancho

Pancho Villa was a leader of the Mexican Revolution in the early 1900s. Some

people called him a dangerous revolutionary. Many others saw him as a defender of the poor.

Pancho Villa was born on June 5, 1878, in San Juan del Río, in northern Mexico. His name at first was Doroteo Arango. As a young man he led a gang of criminals and changed his name to Francisco Villa. Pancho was a nickname.

The president of Mexico, Porfirio Díaz, was hard on the common people. Villa helped a leader named Francisco Madero to overthrow Díaz in 1911. This began the Mexican Revolution. Victoriano Huerta, who was Madero's army chief, did not trust Villa. He put Villa in prison. But Villa escaped to the United States. In 1913 Huerta seized control of Mexico from Madero. Then Villa returned to Mexico.



Pancho Villa

Villa put together a group of fighters called the Division of the North. In 1914 Villa and Venustiano Carranza, another leader of the revolution, defeated Huerta. Carranza became the new leader of Mexico.

Carranza and Villa soon turned against each other. Carranza forced Villa and Emiliano Zapata, another rebel leader, out of Mexico City, the capital. In 1915 the United States gave its support to Carranza. Villa then murdered U.S. citizens in both Mexico and the United States. U.S. soldiers invaded Mexico in 1916, but they did not find Villa.

Carranza was overthrown in 1920. Then Villa stopped fighting the government. Someone killed Villa on his ranch near Parral, Mexico, on June 20, 1923. Police never solved the murder.

► More to explore

Mexico • Zapata, Emiliano

Vilnius



Population
(2008 estimate)
544,200

Vilnius is the capital of Lithuania, a country in northeastern Europe. It is the largest city in Lithuania.



The cathedral of Vilnius stands at the end of a street in the city's Old Town. The original cathedral was built in the 1300s. The current building dates from 1801.

Service industries such as banking, trade, and tourism are important to the economy of Vilnius. The city is also a major manufacturing area. The leading industries include clothes making, food processing, and printing and publishing.

Vilnius dates back to about the 900s. In the 1500s the city grew as a trading center. For hundreds of years it was also a center of Jewish culture and learning.

Many countries—including Russia, Sweden, and Poland—controlled Vilnius throughout its history. The Soviet Union captured Lithuania in 1940.

German troops ruled Vilnius in the early 1940s, during World War II. The city suffered heavy damage. The Germans murdered nearly all the city's Jews. This was part of a mass killing called the Holocaust.

After the war the Soviet Union again ruled Lithuania. In 1991 Lithuania

became a fully independent country. Vilnius once again became its capital.

► **More to explore**

Holocaust • Lithuania

Vinegar

Vinegar is a sour liquid that is used to flavor and preserve food. It is made by putting alcohol through a chemical change called fermentation.

The word vinegar comes from the French words for sour wine. Vinegar that is made from grapes is called wine vinegar. But vinegar can be made from other foods as well. Vinegar made from apples is called cider vinegar. Vinegar made from barley or oats is called malt vinegar.

The process of making vinegar starts with liquid that comes from the grapes, apples, or other foods. When a substance called yeast is added to the liquid it converts sugars in the liquid into alcohol. Tiny living things called *Acetobacter* bacteria then make the alcohol combine with oxygen in the air to form acetic acid and water. The acetic acid is what gives vinegar its sour taste.

Acetic acid is a strong acid. The vinegar that is sold in supermarkets is only about 4 percent acetic acid. Water and flavorings make up the other 96 percent.

Vinegar is used to add a sour taste to foods. Cooks make a sour salad dressing called vinaigrette by mixing vinegar with cooking oil and spices. Cooks also use

vinegar to preserve foods. This practice is called pickling. Pickles are cucumbers that have been pickled. Many other kinds of vegetables and fish can also be pickled.

► **More to explore**

Acid and Base • Fermentation

Violet

Violets are popular garden plants with delicate flowers. They also grow in the wild. There are about 500 species, or types, of violet. They include the common blue violet and the pansy. The popular houseplants called African violets are not in the same family as true violets.

Violets grow in places that have warm summers and cold winters. They are hardy plants and can grow well under trees and shrubs. The smallest violets are about 2 inches (5 centimeters) high. The largest can reach a height of more than 20 inches (50 centimeters).



The common blue violet has heart-shaped leaves and purple or white flowers.

Did You Know?

Some people use vinegar to treat wasp stings. However, the vinegar treatment probably does not work.

Violets often have large, heart-shaped leaves. The flowers have five petals. They are most commonly deep purple, blue, or lavender. They also can be white, yellow, reddish purple, or a combination of colors.

Some people eat the flowers of violets. In addition, sweet-smelling violets are used to make perfume.

► More to explore

Flower • Plant

Viper

The vipers are a group of poisonous snakes that have sharp fangs. There are about 200 species, or types, of viper. Some of the deadliest snakes in the world are vipers. Well-known types include rattlesnakes and adders.

Vipers are found throughout the world except in Australia and Antarctica. They live in both dry and wet climates. Vipers may spend time on the ground, in trees, or in water.

Some vipers are less than a foot (30 centimeters) long. Others are more than 10 feet (3 meters) long. A viper's body may be thin or thick. The color ranges from tan to black to green. Vipers blend in well with their surroundings. This helps to protect them from their enemies.

Vipers have a triangular head. Many have scales that stand up straight above their eyes. These scales make it seem like the snake has horns. Vipers have long



The common adder is a viper. Common adders live on the island of Great Britain and in many other parts of Europe and Asia.

fangs compared to other snakes. When a viper closes its jaw, its fangs fold up against the roof of its mouth. Some female vipers lay eggs. Others give birth to live young.

Vipers do not really hunt for food. Instead they wait for small animals to come to them. Once a prey animal is near, a viper bites quickly and injects venom, or poison, into it. The prey usually dies nearby. The viper then finds the prey using its sense of smell. It swallows the prey whole.

Some types of viper are called pit vipers. Pit vipers have special organs called pits on both sides of their face. These pits help them sense heat coming from the body of their prey. Once a pit viper senses the heat, it can attack its prey even in the dark. Pit vipers include rattlesnakes, copperheads, fer-de-lances, and moccasins.

► More to explore

Rattlesnake • Snake



Virginia

Virginia has one of the longest continuous histories among the U.S. states. Its history dates back to the English settlement of Jamestown in 1607. Virginia was named for Queen Elizabeth I of England. She was often called the Virgin Queen because she never married. The state is also referred to as the Birthplace of Presidents. Eight presidents of the United States were born in Virginia, including George Washington and Thomas Jefferson. Richmond is the capital.

Geography

Virginia is located in the southeastern part of the United States. The Potomac River separates northeast Virginia from Maryland and Washington, D.C. The Atlantic Ocean runs along part of eastern Virginia. Tennessee and North Carolina border Virginia at the southern end. West Virginia and Kentucky border Virginia to the west.

Five different natural regions exist in the state. Eastern Virginia is a low-lying coastal plain. To the west of the coastal



Shenandoah National Park covers a large section of the Blue Ridge Mountains in Virginia. The mountains stretch from northeast to southwest through the western part of the state.

plain is a large region of low rolling hills. Further west is a highland region. It is the site of Mount Rogers, the highest point in the state. Most of western Virginia is a region of valleys and ridges. The region includes the Shenandoah River valley. A plateau region covers a small area in far western Virginia. It contains a maze of deep ravines and winding ridges. Virginia's weather tends to be mild and pleasant.

People

Most of Virginia is populated by people whose ancestors came from Europe. Northern Virginia, near Washington, D.C., tends to have a greater mix of ethnic groups than other parts of the state. More than 70 percent of Virginia's population is white. About 20 percent of



the population is African American, and about 5 percent is Hispanic.

Economy

About one fifth of Virginia's workforce is involved in public administration. These people are employed by the local, state, or federal government. Some of these are members of the military, such as the Marines stationed at the base in Quantico. Many military employees work at the Pentagon, the headquarters of the United States Department of Defense.

Major agricultural products in Virginia are chickens, cattle, and dairy goods. Important crops include tobacco, soybeans, and corn. The production of food products is the most valuable manufacturing industry in the state. Major products include processed meat, baked goods, and beverages. Chemical, computer, and electronic products are also profitable manufactured goods.

Tourism is a vital part of Virginia's economy. Many tourists visit sites related to the history of the United States. Some like to see historical buildings, such as the homes of presidents George Washington and Thomas Jefferson. Others are interested in Virginia's many American Revolution and American Civil War battlefields. Another popular tourism site is Colonial Williamsburg. The village looks much like it did in colonial times. To re-create the village's early years, actors behave and dress like early colonists.

History

Before the arrival of the English in the 1600s the largest group of Native Americans in the region was the Powhatan Confederacy. The first permanent English settlement in America was Jamestown, near Chesapeake Bay. It was named for James I of England, who was king when the settlers arrived in May 1607. The people of Jamestown had a hard time surviving during the first years. In 1624 Jamestown became an English royal colony.

Many farmers in Virginia became rich by growing and selling tobacco. England wanted to benefit from the money being made in Virginia and in other colonies in America. To do that, it kept putting taxes on the colonists. In May 1776, Virginia patriots asked the Continental Congress to declare the American Colo-



An instrument maker carves a violin neck in Colonial Williamsburg. The village of Williamsburg re-creates daily life in early Virginia.

Facts About VIRGINIA

Flag



Population

(2000 census)
7,078,515—
rank, 12th state;
(2008 estimate)
7,769,089—
rank, 12th state

Capital

Richmond

Area

42,774 sq mi
(110,785 sq
km)—rank, 35th
state

Statehood

June 26, 1788

Motto

*Sic Semper
Tyrannis* (Thus
Ever to Tyrants)

State bird

Cardinal



State flower

Dogwood



nies free from British rule. Members of that legislative body agreed. This decision led to the Declaration of Independence, which was adopted on July 4, 1776.

Virginia was the scene of many battles during the American Revolution. The war's final battle took place in Yorktown, Virginia. After the battle, the British commander surrendered to George Washington on October 19, 1781. The former colonies then turned to the task of creating a system of national government. Virginia's state constitution was used as a guide. In 1788 Virginia entered the Union as the new nation's 10th state.

Virginia legalized slavery in 1661. By the 1860s, however, states in the North wanted slavery to end. Southern states such as Virginia considered slave labor necessary to their economies. Eventually, Southern states withdrew from the Union to form their own government. This Southern government was known as the Confederacy.

Virginia joined the Confederacy in 1861. Richmond, Virginia, soon became the Confederate capital. The American Civil War began soon after the Confederacy was founded.

At the time, Virginia included what is now West Virginia. People in the western part of Virginia had smaller farms than those in the east, and they did not use slaves to run them. They often disagreed with the slaveholders in eastern Virginia. In 1863, more than 50 coun-

ties in northwest Virginia decided to become the separate state of West Virginia.

Virginia was the site of Bull Run and many other bloody battles during the Civil War. By April 1865, Confederate leaders realized that the South could not win. Confederate general Robert E. Lee surrendered to Union commander Ulysses S. Grant at Appomattox, Virginia. This surrender ended the war.

Virginia rejoined the Union in 1870. It took a long time for the state to rebuild all the structures that had been damaged during the war. It also took many years for African Americans in the state to gain the same rights as whites.

In the 20th century Virginia began to show characteristics of both the North and the South. Virginia's northern counties reflected the worldly city character of the nearby national capital, Washington, D.C. Other areas of the state remained more rural. In rural Virginia the history and culture of the Deep South could still be felt.

In the late 20th century some cities began to spread into the countryside. Some people in the state were unhappy with this growth. They complained that important American Civil War battlefields were sometimes threatened by people wanting to take over the land to build more houses.

► More to explore

American Revolution • Richmond

Virunga Mountains

The Virunga Mountains are a mountain range, or group of mountains, in east-central Africa. They span parts of Uganda, Rwanda, and the Democratic Republic of the Congo. There are eight major peaks. All are volcanoes.

Six of the major peaks in the Virunga Mountains are extinct volcanoes, meaning that they no longer erupt. The extinct volcanoes are named Mikenno, Sabinio, Visoke, Mgahinga, Muhavura, and Karisimbi. Karisimbi is the highest peak in the Virunga Mountains. It is 14,787 feet (4,507 meters) high. It is on the border between Rwanda and the Democratic Republic of the Congo.

The other two major peaks are active volcanoes. This means that eruptions



Muhavura is one of the main peaks of the Virunga Mountains.

still take place there. The active volcanoes are named Nyiragongo and Nyamulagira. In 2002 a flow of lava, or melted rock, from Nyiragongo destroyed much of the city of Goma in the Democratic Republic of the Congo.

Forests on the slopes of the Virunga Mountains are home to the mountain gorilla. The mountain gorilla is very rare and in danger of dying out. All three countries in the region have set aside areas as national parks. In a national park, wild animals and their habitat are protected by law.

► More to explore

Africa • Gorilla • Volcano

Virus

Viruses are tiny particles that cause disease in people, other animals, and plants. Different viruses cause the common cold, influenza (flu), chicken pox, measles, AIDS, and many other diseases.

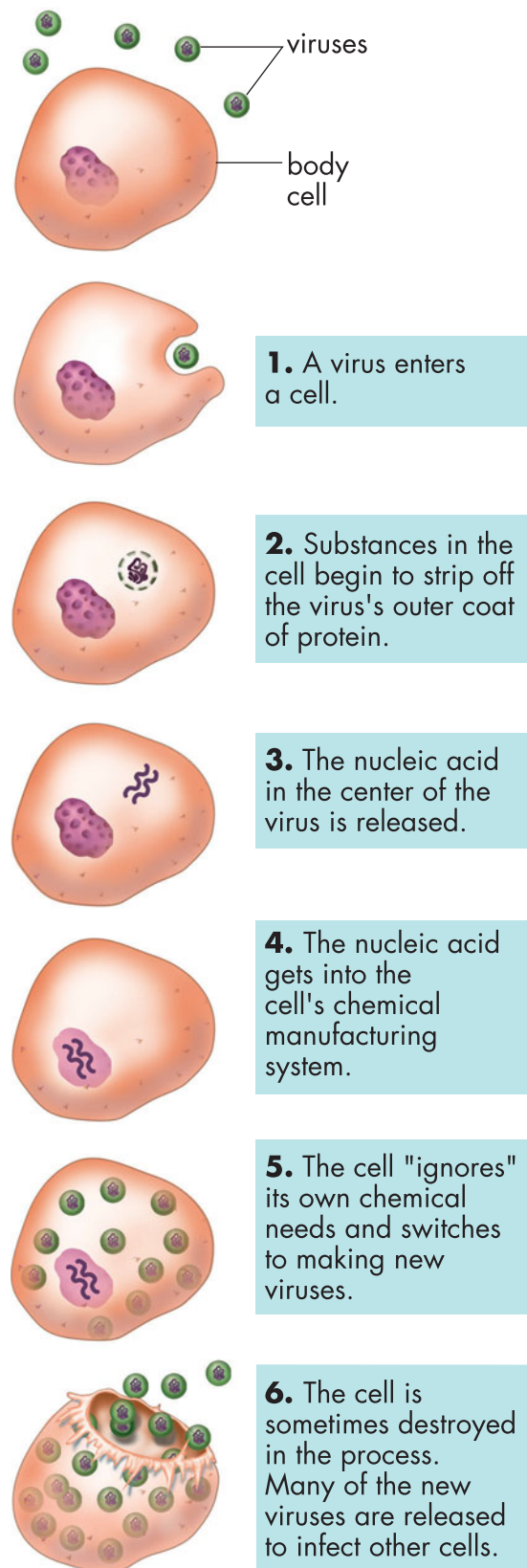
Viruses are so tiny that people can see them only with powerful microscopes. Some viruses have a spherical, or round, shape. Others are shaped like rods. Viruses are made up mostly of a substance called nucleic acid surrounded by protein.

On its own, a virus is lifeless. However, it becomes active when it infects, or enters, a cell of an animal or a plant. Once inside a cell, a virus can reproduce itself, like living things can. The copies that a virus makes of itself are called virions. These virions can leave the origi-

Did You Know?

Antibiotic drugs kill bacteria but have no effect on viruses. Drugs that work against viruses are called antiviral drugs.

How a Virus Invades a Cell



A virus reproduces itself by taking over a living cell and making it into a virus factory.

nal cell and infect other cells. Viruses also can live in bacteria, which are living things made up of only one cell.

Humans and other animals have natural defenses against viruses. Fever is one important way that the human body fights viruses. A fever is when a body's temperature rises. A fever causes some viruses to become inactive. The body's immune system also fights viruses. It produces white blood cells and substances called antibodies to attack viruses. After these cells and antibodies have attacked a virus, they stay in the body. This prevents future infection by the same virus.

Doctors use vaccines to prevent many diseases caused by viruses. Vaccines are substances made from dead or weakened viruses. They prepare the immune system to fight off active forms of these viruses.

► More to explore

Cell • Disease, Animal • Disease, Human • Immune System • Vaccine

Vitamins

Vitamins are nutrients that humans need in order to grow, reproduce, and be healthy. Only two vitamins are made in the human body. People get most of the vitamins they need from food or vitamin pills.

Scientists have identified 13 vitamins: A, eight B vitamins, C, D, E, and K. These vitamins can be obtained through a healthy diet filled with a variety of



Apples and other fresh fruits contain many of the vitamins that growing children as well as adults need.

foods, including plenty of fruits and vegetables.

Vitamins D and K are both found in foods and produced by the human body. The body makes vitamin D when the skin is exposed to sunlight. Bacteria in the intestines produce vitamin K.

Certain vitamins (the B complex vitamins and vitamin C) dissolve in water. The body stores a small amount of these vitamins but gets rid of most of those it does not use. For this reason, people need to take in plenty of these vitamins every day.

Other vitamins (A, D, E, and K) do not dissolve in water. The vitamins that the body does not use right away are stored in the body's fat and liver. Getting too much of these vitamins can be dangerous over time.

► More to explore

Food and Nutrition

Volcano

A volcano is an opening in Earth's crust. When a volcano erupts, hot gases and melted rock from deep within Earth find their way up to the surface. This material may flow slowly out of a fissure, or crack, in the ground, or it may explode suddenly into the air. Volcanic eruptions may be very destructive. But they also create new landforms.

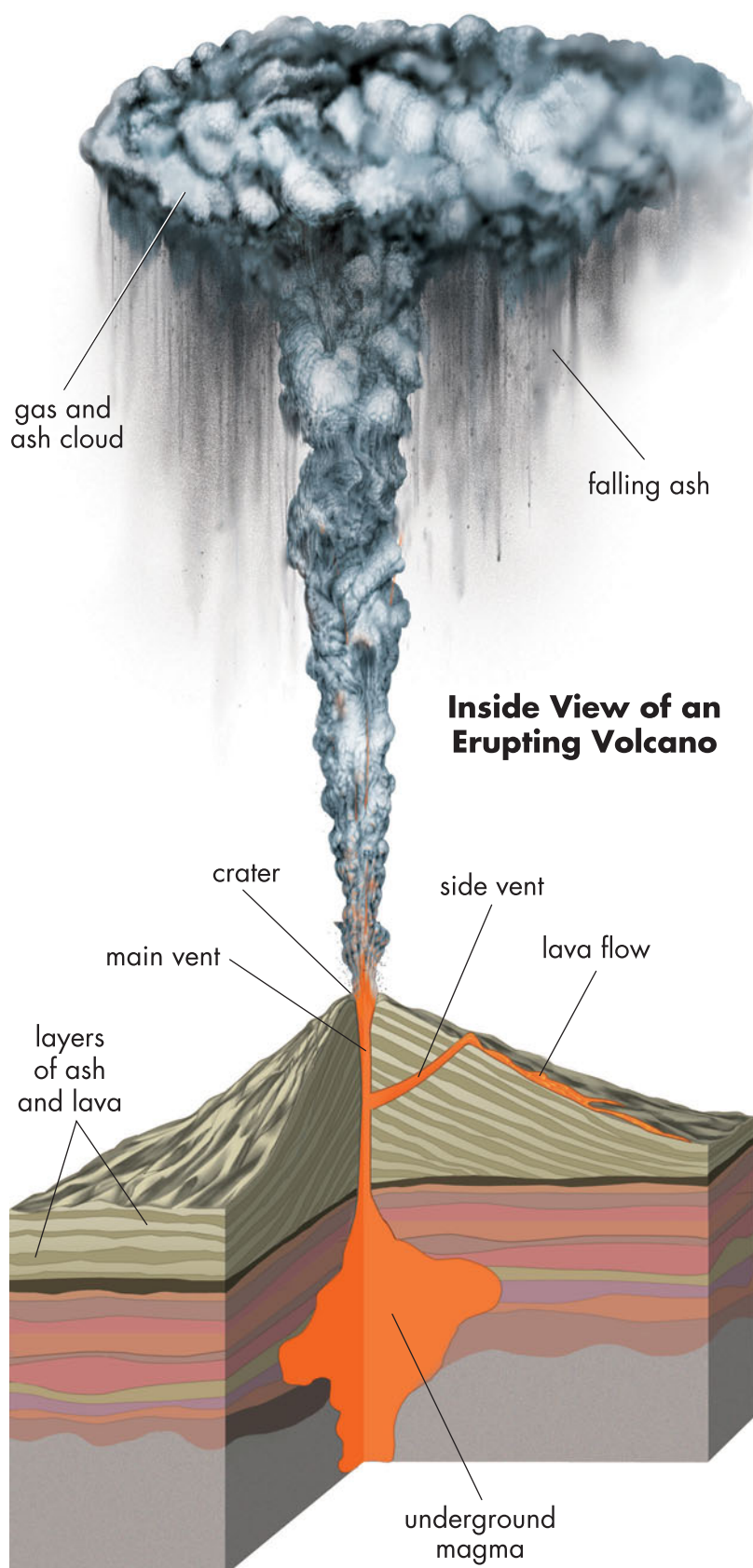
A Volcanic Eruption

During a volcanic eruption, hot melted rock called magma escapes from a vent, or opening, in Earth's surface, or crust. Magma released from a volcano is known as lava. Fresh lava ranges from 1,300° to 2,200° F (700° to 1,200° C) in temperature. It glows red as it flows out of the volcano's opening. As it cools, it hardens into rock.

Strong volcanic eruptions throw bits of magma into the air. These bits cool into tiny pieces of rock, called volcanic dust or volcanic ash. Wind can carry volcanic



An erupting volcano threatens a village in Indonesia. Glowing liquid rock called lava flows down the side. Clouds of smoke and ash fill the air.



During a volcanic eruption, lava flows from vents. Ash and gas shoot into the air.

dust thousands of miles away. Volcanic ash can coat the land for miles around the volcano.

Steam and poisonous gases also escape from volcanoes. Sometimes these gases mix with ash to create destructive fiery clouds.

Where Volcanoes Form

Earth's crust is made up of huge, rocky pieces called plates. The plates move slowly over the crust. Most volcanoes lie along the boundaries between these plates.

Some of the most violent eruptions take place where the edge of one plate is forced beneath the edge of another. This forces magma to rise to the surface. Hot gases in the magma make these volcanoes very explosive. Most volcanoes of this type are found around the edges of the Pacific Ocean. This huge circle of volcanoes is known as the ring of fire.

Volcanoes also form in places where two plates slowly pull apart. Molten rock rises through the gap between the plates. It causes fissure eruptions, in which lava flows out over the ground. This type of volcano is common along the Mid-Atlantic Ridge, a mountain chain under the Atlantic Ocean. Volcanoes in the northern part of this ridge formed the island country of Iceland.

A small number of volcanoes are not located along the edges of plates. They form at "hot spots" in Earth's crust. At a hot spot, molten rock rises from deep below the crust. The volcanoes of

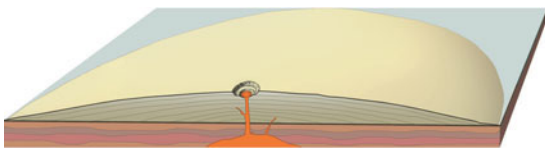
Hawaii are the best examples of hot-spot volcanoes.

Volcanic Landforms

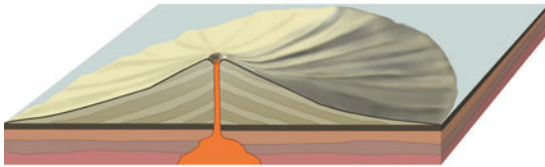
Volcanic eruptions create new landforms that are also called volcanoes. The two most common types are stratovolcanoes and shield volcanoes.

Stratovolcanoes are mountains shaped like cones. They have a narrow top with steep sides and a wide bottom. A crater, or bowl-shaped pit, usually lies at the

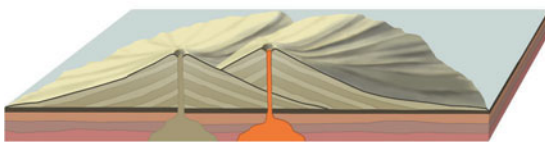
Volcanic Landforms



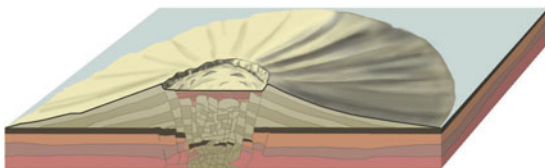
shield volcano



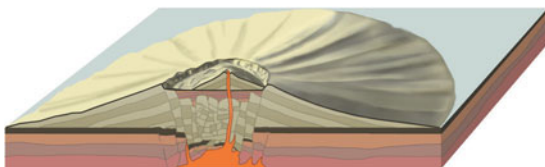
stratovolcano



complex volcano



caldera



somma volcano

Eruptions of volcanoes can create several different types of landforms.

top. Stratovolcanoes are made up of layers of hardened lava and ash. Thousands of eruptions left these layers over millions of years. Mount Fuji in Japan is a stratovolcano.

Shield volcanoes are dome-shaped mountains built by lava flows. They are not as steep as stratovolcanoes. The volcanoes of Hawaii are shield volcanoes.

Sometimes the top of a volcano collapses and forms a pit called a caldera. A caldera is larger than a crater. Some calderas fill up with water to form lakes. A somma volcano forms when a new volcanic cone partially fills a caldera.

A complex volcano has more than one vent. A volcano can have more than one vent when two cones overlap one another. Or a volcano can form new vents during an explosion.

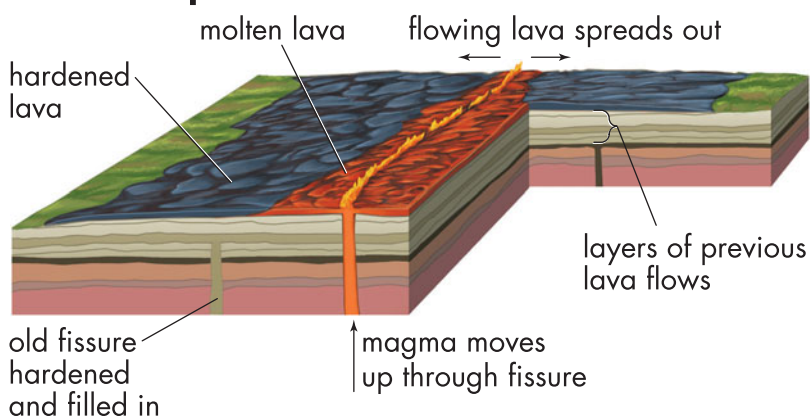
Hot Springs, Geysers, and Fumaroles

Hot springs, geysers, and fumaroles are other types of volcanic activity. They happen in places where magma heats underground water. A hot spring is a place where warm water comes up through the ground. A geyser is a kind of hot spring that shoots water and steam into the air. Fumaroles are vents that release gas and steam.

Studying Volcanoes

Volcanology is the branch of geology that focuses on volcanoes. Scientists who study volcanoes keep track of earthquakes and other signs of volcanic activ-

Fissure Eruption



The mildest type of volcanic eruption consists of a flow of lava from fissures, or cracks, in the ground. This type of eruption takes place in Iceland.

ity. They try to predict when an eruption may take place.

History

Volcanoes have a long history of destruction. In AD 79 the eruption of Mount Vesuvius destroyed the Roman cities of Pompeii and Herculaneum. Two of the deadliest volcanic eruptions happened in 1815 and 1883 on islands in what is now Indonesia. The eruptions killed tens of thousands of people.

The 1980 eruption of Mount Saint Helens, in the U.S. state of Washington, was one of the biggest in North America. The 1991 eruption of Mount Pinatubo, in the Philippines, was the largest of the 1900s. These eruptions killed fewer people than earlier volcanoes, but they still destroyed much property.

► More to explore

Fuji, Mount • Geology • Hawaii
• Iceland • Mountain • Ring of Fire
• Vesuvius, Mount

Vole

Voles are small mammals that belong to the rodent family. They look like mice.

There are more than 100 species, or types, of vole. They are found in North America, Europe, and Asia. A small number of voles live in the African country of Libya. Voles can be found in many different habitats, including forests, prairies, and meadows.

Voles have small eyes and ears. Their snout is blunt rather than pointy. The tail is shorter than the body. Voles have long, soft fur that is usually gray, brown, or reddish in color.

Most voles grow between 4 to 10 inches (10 to 26 centimeters) long, including the tail. The woodland vole is one of the smallest. It weighs less than 1 ounce (35 grams) and is under 5 inches (13 centimeters) long. One of the larger voles is the European water vole. It weighs up to



Most voles live in underground tunnels. They come aboveground to find food.

9 ounces (250 grams) and is 14 inches (35 centimeters) long.

Voles are active year-round. They eat plants and sometimes insects. Most voles live in burrows, or underground tunnels. But some, such as the Sonoma tree vole, live in trees. Water voles are found near ponds and streams. They are excellent swimmers.

► More to explore

Mammal • Rodent

Volga River



The Volga is Europe's longest river. It flows 2,325 miles (3,740 kilometers) through western Russia. The Volga has played an important part in the life of the Russian people. In Russian folklore it is called Mother Volga.

The Volga begins in the Valdai Hills northwest of Moscow, Russia's capital. It flows generally southward to the Caspian Sea. Canals and other rivers connect the Volga to the Baltic Sea, the White Sea, the Sea of Azov, and the Black Sea.



The Volga River now has dams to control flooding. People build houses close to the riverbank because they are not afraid of rising waters.

The Volga gets about 60 percent of its water from melting snow. The rest of its water comes from underground sources and rainfall. The Volga used to flood during the spring. Today dams and artificial lakes called reservoirs store its water and prevent floods.

The Volga is important to Russia's economy. Power stations at the reservoirs use the river to produce electricity. Boats on the Volga carry more than half of the goods shipped within Russia. Construction materials, including timber, make up most of the shipments. Many passenger boats also use the Volga.

► More to explore

Caspian Sea • River • Russia

Volleyball

Volleyball is a team sport in which players use their hands or arms to knock a ball over a net. Two teams, usually with six players each, compete in a volleyball

game. Volleyball can be played inside, in a gym, or outside, on a beach or in a park.

Court and Equipment

Volleyball is played on a court that is 30 feet (9 meters) wide by 60 feet (18 meters) long. A center line divides the court into two equal areas. A net runs along the center line. Each team defends one side of the net. A volleyball is filled with air and weighs 9 to 10 ounces (260 to 280 grams).

Playing the Game

Play begins when one player serves. A player serves by hitting the ball over to the receiving team's side of the net. The receiving team tries to return the serve, or hit the ball back over the net. The receiving team can return the serve with a single hit. More often, though, the receiving team tries to set the ball. To do this, players hit the ball into the air on their own side of the net. A good set allows a teammate to drive the ball over



Many people enjoy playing a casual game of volleyball at the beach or in a backyard.

the net with great force. This makes it harder for the other team to hit it back.

The teams hit the ball back and forth over the net until one team scores a point. A team scores a point when it lands the ball on the floor inside the other team's playing area. A team also scores a point if the other team hits the ball out of bounds or makes some other error. Scoring 25 points wins a game. A team has to win by at least two points.



Players from Cuba and China face each other during an international volleyball tournament.

History

William G. Morgan invented the game of volleyball in 1895 at the Young Men's Christian Association (YMCA) in Holyoke, Massachusetts. It quickly became popular in schools and on playgrounds throughout the United States. In the early 1900s the sport spread throughout the rest of the world. In 1947 an organization called the Fédération Internationale de Volleyball (FIVB) was formed to govern the sport worldwide. In 1964 volleyball became a sport for both men and women in the Summer Olympics.

Today the FIVB sponsors several other international tournaments as well.

► More to explore

Olympic Games • Sports

Voting

Voting is a process by which a group of people can decide things fairly when they do not all agree. Voting is an important part of the type of government called democracy. In a democracy people use voting to choose government leaders. They also may vote for or against certain laws or projects in their community. The right to vote is called suffrage.

Elections

When a group of people votes, it is called an election. In an election for a government job, the people who want the job are called the candidates. Candidates often run a campaign before an election. During a campaign a candidate tries to convince voters that he or she is

right for the job. Candidates often make speeches and run advertisements on television.

On election day people usually go to a polling place to vote. Polling places are often in schools, community centers, or other public buildings. At the polling place people vote for their favorite candidate. They use a machine to make their choice, or they mark their choice on a form called a ballot. Everyone's choice remains secret. After the election, machines or election workers count the votes for each candidate. The candidate with the most votes usually wins the election.

The Right to Vote

Every country that holds elections sets its own rules about who can vote. Today most countries allow nearly all adult citizens to vote. Sometimes people who have committed serious crimes cannot vote. People who have certain mental disabilities sometimes cannot vote either.

In the past many countries allowed only white men to vote. In the United States African American men gained the right to vote in 1870, after the end of slavery. Women in New Zealand, Australia, the United Kingdom, and the United States won the right to vote by 1920. Women in most other countries gained suffrage by the end of the 1900s. Black men and women in South Africa first voted in national elections in 1994.

► More to explore

Citizenship • Civil Rights • Democracy
• Women's Rights

Did You Know?

Voting is a duty in Australia and some other countries. Australians who fail to vote must pay a fine.



Workers in India learn how to use a new voting machine.

Vulcan

► see Hephaestus.

Vulture

Vultures are large birds of prey. Unlike other birds of prey, vultures usually do not hunt for live animals. They mostly eat dead meat and garbage instead.

When one vulture finds a dead or dying animal, others fly in from miles away to share in the meal.

Some of the biggest of all flying birds are vultures. Vultures can fly for hours, soaring gracefully on their long, broad wings. Their feathers are usually brown, black, or white. However, most vultures do not have feathers on their heads and necks. Vultures have excellent eyesight.

Vultures live mainly in warm regions. There are two groups of vultures, New World vultures and Old World vultures. They have many similar characteristics, but they are not closely related.



A source of food attracts crowds of vultures in Africa. Dead animals and garbage form most of their diet.

New World Vultures

The New World vultures live in North and South America. They are probably related to storks. These vultures do not build nests. Females lay their eggs on cliffs or in trees. Larger types of New World vulture lay one egg at a time. Smaller types lay two.

The black vulture is a New World vulture that is about 24 inches (61 centimeters) long. The California condor is a huge New World vulture. It may reach 55 inches (139 centimeters) long with a wingspread of about 9.5 feet (2.9 meters). The California condor nearly died out in the late 20th century, but scientists are trying to save it. Other New World vultures include the turkey vulture and the Andean condor.

Old World Vultures

The Old World vultures live in Europe, Asia, and Africa. They are closely related to eagles and hawks. Old World vultures build nests out of sticks on cliffs or in trees. Sometimes many vultures build nests in groups called colonies. The larger types usually lay one egg at a time.

The cinereous vulture is a large bird in this group. It is about 39 inches (99 centimeters) long. The lappet-faced vulture is about the same size. Large folds of skin, called lappets, hang down from its head. Other Old World vultures include the griffon vulture and Egyptian vulture.

► More to explore

Bird • Bird of Prey • Eagle • Hawk
• Stork

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The U.S. artist Andy Warhol is famous for his paintings of soup cans.

(See Warhol, Andy.)

The whippoorwill, a kind of bird, is named for its call—three whistled notes that sound like “whip-poor-will.”

(See Whippoorwill.)

Winds are named after the direction from which they come, not the direction toward which they blow.

(See Wind.)

There are three species, or types, of wolf: gray, red, and Ethiopian.

(See Wolf.)

The 19th Amendment to the U.S. Constitution gave women throughout the United States the right to vote.

(See Women’s Rights.)

Wabanaki

► see Abnaki.

Wales



Wales is part of the United Kingdom, a country of western Europe. The other three parts of the United Kingdom are England, Scotland, and Northern Ireland. The people and the special language of Wales are called Welsh. In the Welsh language, Wales is known as Cymru. The capital of Wales is Cardiff.

Geography

Wales is in the southwestern part of the island of Great Britain. It borders England on the east. On the other three sides it is surrounded by water. The land is rugged. The Cambrian Mountains extend from north to south through Wales. The other major mountain areas are the Snowdonia in the north and the Brecon Beacons in the south. The coast has many cliffs and beaches. The Severn, Wye, and Dee

are the longest rivers. The climate is cool and wet.

People

The Welsh people can trace their roots back to the Celts. The Celts were people who lived in the area thousands of years ago. The Welsh language came from the language of the Celts. About one fifth of the people of Wales speak Welsh. English is the other main language. Schools have classes in both English and Welsh. Most of the Welsh people are Protestant.

Economy

Most of the people of Wales work in services such as government, education, banking, and tourism. Manufacturing, farming, and forestry are also important to the economy. Factories make electrical, automotive, chemical, and metal products. Farmers raise sheep, cattle, and poultry. Major crops include barley, wheat, potatoes, and oats.

History

The Celts lived in Wales in prehistoric times. The Romans invaded in the 1st



Conwy Castle is one of many castles in Wales. King Edward I of England had it built in the 1280s.

century AD. The Romans used the name Britons for the Celts they found. Roman rule ended in about 400. Then a number of new Celtic kingdoms were formed. The English considered the Britons to be Welsh. The name Welsh comes from an Old English word meaning “foreigner.” But the people of Wales called themselves Cymry, which means “countrymen” in Welsh.

In the 800s and 900s Welsh princes tried to unite the kingdoms. They were not successful. In 1093 French invaders, called the Normans, brought all of southern Wales under their rule. In the 1100s and 1200s the kings of England made several attempts to conquer Wales. King Edward I was finally successful in 1277. In 1301 he gave his son the title prince of Wales.

In 1401 the Welsh revolted against the English. For a few years Wales was independent. By 1410, however, the English had regained control. In 1536 Wales was officially united with England. In 1801 Wales became part of the United Kingdom along with England, Scotland, and Ireland. (Later most of Ireland split from the United Kingdom, but Northern Ireland remained.)

In the 1800s and 1900s the people of Wales worked for the right to govern themselves. In 1997 the people voted to form a lawmaking body of their own. The body, called the National Assembly for Wales, was formed in 1999. It took

control of many things that the national Parliament in London had handled before.

► More to explore

Cardiff • Celt • England • Northern Ireland • Scotland • United Kingdom

Walkingstick



A walkingstick rests on a plant. The insect's color and shape make it look like a twig.

Walkingsticks are insects that look like the twigs of a plant. They are also called stick insects. There are about 2,000 species, or kinds, of walkingstick. They are most numerous in the tropics.

Walkingsticks are long and thin. They can be more than 12 inches (30 centimeters) long. Tropical species are the largest. Walkingsticks have wings, but they do not fly. Instead they walk with a rocking motion that makes them look like a stick being blown in the wind.

Lizards and birds eat walkingsticks. The insects try to blend in with their surroundings so they will not be noticed. Walkingsticks are green or brown, which makes them look like the plants on which they feed. Some species have sharp spines or give off a bad smell to help keep enemies away. If a walkingstick loses legs or antennas to an enemy, it can grow new ones.

Female walkingsticks scatter their eggs on the ground. The eggs of some walkingsticks look like seeds. This helps keep the eggs from being discovered. The eggs hatch within several months. A walkingstick usually lives for less than a year.

► More to explore

Insect • Protective Coloration

Walrus

The walrus is a large mammal that lives in cold Arctic seas of Europe, Asia, and North America. It is closely related to the seals. The walrus can be told apart from seals by the two large upper teeth, called tusks, that stick down from its



Walrus often live in large groups.

mouth. The scientific name of the walrus is *Odobenus rosmarus*.

The walrus has a stocky body and a rounded head. It has flippers instead of legs. Its mouth is covered with stiff whiskers. The skin is wrinkled and grayish brown. A thick layer of fat below the skin, called blubber, keeps the walrus warm. Walrus can be 12 feet (3.7 meters) long and weigh more than 2,600 pounds (1,200 kilograms).

The walrus has a tusk on each side of its mouth. The tusks can be 3 feet (1 meter) long. The walrus uses its tusks to fight. It also uses them to cut holes in ice and to pull itself out of water.

Walrus live in groups that can include more than 100 animals. They spend most of their time in the sea. They sometimes rest on ice or rocky islands. In the water a walrus uses its flippers to swim. On land it turns its rear flippers forward under its body to waddle around.

Walrus eat mostly clams. They dig clams from the seafloor with their tusks. They shovel food into the mouth with their whiskers.

► More to explore

Mammal • Seal

Wampanoag

The Wampanoag are a Native American people of New England. They traditionally lived in villages in Massachusetts, Rhode Island, and on nearby islands.



An engraving shows a Wampanoag man dressed for battle.

The Wampanoag built dome-shaped houses called wigwams. Several families lived in each wigwam. The Wampanoag hunted and fished. They also grew corn, beans, and squash.

The Wampanoag were the first Native Americans to deal with the English settlers known as the Pilgrims. The Pilgrims established a colony at Plymouth, Massachusetts, in 1620. Massasoit, the Wampanoag chief, made a peace treaty with the Pilgrims that lasted for 40 years. The Wampanoag taught the Pilgrims the skills they needed to survive in their new home.

Massasoit died in 1661. By that time the relationship between the Wampanoag and the settlers had become tense. Some settlers were taking Wampanoag lands without payment. Massasoit's son Metacom—known to the Pilgrims as King Philip—became chief in 1662. He

got other tribes to help the Wampanoag fight the settlers in what became known as King Philip's War. Metacom was killed, and the Wampanoag were defeated.

The Wampanoag survivors fled their lands. Some traveled to the islands of Nantucket and Martha's Vineyard. At the end of the 20th century there were about 2,000 Wampanoag, mostly on Martha's Vineyard.

► More to explore

- King Philip's War • Massasoit
- Metacom • Native Americans
- Plymouth Colony

Wapiti

The wapiti is a North American deer that is often called American elk. Scientists sometimes consider wapiti to be of the same species, or type, as the red deer of Eurasia. The wapiti is the second largest deer after the moose. Its scientific name is *Cervus canadensis*.



A male wapiti blends in with the dry grass of a meadow in Yellowstone National Park in the U.S. state of Wyoming.

At one time wapiti roamed over most of North America. They are now only in the northwestern United States and southwestern Canada. Wapiti like open woodlands and mountain meadows.

Wapiti weigh about 650 to 1,100 pounds (295 to 500 kilograms). Males may stand taller than 5 feet (1.5 meter) at the shoulder. Wapiti have brown fur with a yellowish white patch on the rump. The shoulders and neck are covered with long, shaggy, dark brown hair. Males have large antlers that are shed and regrown each year.

Wapiti eat a variety of grasses and plants. They generally look for food in the early morning and late evening. In the winter they stay in large groups, but in the summer they break up into smaller ones. In early summer the females give birth to one white-spotted calf.

► More to explore

Deer • Moose

Italian explorers visited Wappinger territory in 1524. In 1609 an English explorer named Henry Hudson arrived. He was working for the Dutch. Hudson claimed the tribe's land for the Netherlands.

The Wappinger gladly traded animal furs to the Dutch for European goods such as metal pots and tools. But the Wappinger also caught diseases such as smallpox and measles from the Dutch. Many Wappinger died of disease.

In the early 1640s the Wappinger and other nearby Indians went to war against the Dutch. They were trying to protect their land from Dutch settlers. The Indians lost the war in 1645.

Most of the surviving Wappinger joined the Nanticoke tribe in the middle of the 1700s. These Wappinger and Nanticoke later merged with other tribes, including the Delaware (Lenni Lenape) and the Mohican. By the 1800s the Wappinger were no longer a separate people.

► More to explore

Delaware • Mohican • Native Americans

Did You Know?

Wappinger chiefs were called sachems. Both men and women could become sachems.

Wappinger

The Wappinger were a group of seven Native American tribes. They lived in what are now New York State and Connecticut.

The Wappinger lived in bark-covered homes called wigwams. They also lived in longhouses. Longhouses were large enough for several related families. They grew corn and other crops. They also hunted and fished.

War

When countries or other large groups of people use weapons to fight each other, the fight is called a war. Throughout history groups of people have used war as a way of settling differences.

Types of War

There are two main kinds of war: international and intranational.

International wars are fought between countries or groups of countries. The Iran-Iraq War (1980–90) was an international war between two countries, Iran and Iraq. World War I (1914–18) and World War II (1939–45) were international wars fought between groups of countries.

Intranational wars are fought between groups within a country. Intranational wars are also known as civil wars, rebellions, or revolutions. Civil wars are wars between two groups of citizens of the same country. The American Civil War (1861–65) started when the Southern states seceded, or separated, from the United States. The Northern states fought to keep this from happening. A rebellion is when citizens rise up against their government and demand change. It may or may not be successful. Revolutions are like rebellions, but in a revolution a group succeeds in overthrowing

the existing government. That group usually establishes a new government.

Causes of War

Countries and other groups of people go to war with one another for a number of reasons. A country may feel that it does not have enough land or resources. It then may try to take these things from a neighboring country by force. Sometimes groups fight wars simply because one group wants to show it is more powerful than another. Civil wars can start when a group within a country wants more power or money. A group also may fight to gain religious freedom.

History

Early Wars

In the earliest wars people fought with simple weapons—for example, wooden clubs, rocks, spears, and bows and arrows. After people learned how to use metals, they fought with swords and



Warriors in ancient times fought on foot, on horseback, on war elephants, and on wheeled vehicles. They fought with bows and arrows, spears, and other weapons. They protected their bodies with shields and armor.

other sharp weapons. They also made better bows and arrows.

For many centuries people fought on foot. About 4,000 years ago armies began to use horses to pull carts called chariots. Armed fighters later began to ride horses into battle.

European fighters first used gunpowder in the 1300s. They used it to blast castle walls and to shoot arrowlike missiles from tubes. Europeans invented the big guns called artillery, including cannons, during this time. In the mid-1400s European inventors made the first rifles and handguns. For the first time soldiers on foot could carry guns.

Modern War

A huge change in war happened in the 1800s, during the Industrial Revolution. (The Industrial Revolution was a time when people invented new ways to make goods quickly and cheaply.) Large numbers of guns became available for armies. Guns also

became more powerful and accurate. The first machine guns appeared in the late 1800s.

Other inventions allowed people to fight much larger wars. Steam engines allowed warships to move around without depending on wind. Telegraphs allowed fast communication between troops. Railroads moved troops and supplies farther and faster. All these new developments made war much more destructive.

The next major advance in war came with the use of airplanes during World War I. Pilots could now drop bombs from the air. Armies also used tanks, submarines, and chemical weapons (weapons that released poisonous gas) during this war.

During World War II tanks and many other kinds of weapons improved. But the biggest change of all was the development of the atomic bomb, the first nuclear weapon. The United States dropped two atomic bombs on Japanese cities during World War II. These bombs killed more than 100,000 people instantly.

After World War II a group of countries formed the United Nations. This organization tries to keep countries from going to war. Many countries also agreed to some new rules of war. These rules are included in a set of agreements called the Geneva Conventions. One of the rules is that warring countries should try



Shallow water does not stop a modern tank. A tank is an armored vehicle that runs on crawler tracks and carries a powerful gun. The first tanks were used in World War I (1914–18).

not to harm civilians (people not in the military).

► More to explore

Bomb • United Nations • World War I
• World War II

Warhol, Andy

Andy Warhol was a U.S. artist famous for his paintings of Campbell Soup cans and portraits of celebrities. Warhol himself became a celebrity, in part because of his unusual personality and sense of style.

Andrew Warhola, as he was originally named, was born in Pennsylvania in about 1928. He studied art at the Carnegie Institute of Technology. After graduating in 1949, he moved to New York City. There he drew illustrations for advertisements. But he wanted to be an artist whose works were shown in art galleries.

In 1962 Warhol showed some of his paintings at a gallery. He had painted 32 pictures of different flavors of Campbell's soup. The soup cans were all painted in the same flat style.

Warhol's paintings were a new kind of art. Warhol took familiar objects and made them into art. Warhol and other artists were called pop artists because they took images from popular culture, or everyday life.

By 1963 Warhol had begun to make pictures from photographs. He started creating portraits of such stars as Mari-



Andy Warhol created paintings of everyday objects and celebrities.

lyn Monroe and Elvis Presley. He made numerous portraits of the same person using different bright colors for each picture.

Warhol called the place where he created his art the Factory. Unlike other artists, he did not treat his works as unique. Instead he mass-produced his art, similar to the way factories make products. The Factory became a place for unusual and famous people to meet. Warhol worked with some of these people to create films. The films were known for not having plots and for being very long.

In 1968 one of Warhol's followers shot and nearly killed him. After recovering, Warhol continued to make art. He died in New York City on February 22, 1987.

► More to explore

Advertising • Arts • Painting

The War of 1812 was the second war between the United States and Great Britain. The United States won its independence in the first war—the American Revolution. Neither country won anything important in the War of 1812.

In the early 1800s Great Britain was fighting a war against France. The

People who lived in newly settled areas of the United States were also angry with Britain. They accused the British of getting Native Americans to attack settlers.



Henry Clay of Kentucky led a group in Congress called “war hawks.” The war hawks got President James Madison to sign a declaration of war against Britain on June 18, 1812.

Early Battles

The United States was not ready for war. The Army first tried to take Canada, which belonged to Britain. The attacks failed. Britain struck back by taking Detroit, Michigan. The U.S. Navy was more successful at first. The USS *Constitution* (“Old Ironsides”) won several battles in the Atlantic.

U.S. forces won two notable victories in 1813. On September 10 ships commanded by Oliver Hazard Perry defeated British ships on Lake Erie. He then helped recapture Detroit. In October, Perry’s ships and troops commanded by William Henry Harrison chased the British into Canada. There the U.S. forces defeated the British in the battle of the Thames. The Native American leader Tecumseh died while helping the British. After this battle, most of the Native Americans stopped fighting.

Later Battles

These victories did not stop the British, however. In August 1814 British troops sailed up Chesapeake Bay and entered Washington, D.C. They burned the White House and other government buildings. They then tried to capture Baltimore, Maryland, but failed. Francis Scott Key wrote the words to “The Star-Spangled Banner” after this battle.



A painting shows the USS *Constitution* and a British warship fighting a sea battle during the War of 1812. Smoke from the guns fills the air between the ships.

On January 8, 1815, British soldiers attacked troops led by Andrew Jackson at New Orleans, Louisiana. Jackson’s forces defeated the British. Both sides fought this battle without knowing that their countries had signed a peace treaty in Ghent, Belgium, on December 24, 1814.

The war was over, but there was no clear winner. The boundaries returned to where they were before the war. Andrew Jackson and William Henry Harrison were considered heroes because of the battles that they won. Both were later elected president of the United States. Another result of the war was that the United States became more independent from Europe. The country developed more of a sense of national identity.

► More to explore

Harrison, William Henry • Jackson, Andrew • Key, Francis Scott • Madison, James • Tecumseh • United Kingdom • United States • White House

Warsaw



Population
(2008 estimate)
1,706,620

Warsaw is the capital of Poland, a country in eastern Europe. It is Poland's largest city and center of culture. Warsaw lies on a flat plain. The Vistula River cuts through the city.

Many people in Warsaw work in service industries such as trade, insurance, education, and tourism. The city is Poland's center of banking. Factories in Warsaw make electronics, cars, processed foods, and other products.



Most of the buildings in the older section of Warsaw, Poland, were rebuilt after World War II. The builders made them look just like the old buildings that were destroyed in the war.

Warsaw was once a small trading settlement. The town grew after a castle was built there in the late 1200s. It became the capital of Poland in 1596.

Warsaw survived great destruction several times. Sweden attacked the city in the 1650s. Russia invaded Warsaw in the 1790s.

Poland fell under foreign rule in the late 1700s. In 1918, after World War I, it became an independent country again. Warsaw was its capital.

Nazi troops from Germany ruled Poland during World War II, from 1939 to 1945. They murdered hundreds of thousands of Jews, Poles, and other people from Warsaw. This was part of a mass killing called the Holocaust.

The Nazis forced Warsaw's Jews to live in terrible conditions in an area called a ghetto. In 1943 the Jews fought an uprising against the Nazis. The Jews were greatly outnumbered, however. The Nazis recaptured the ghetto and destroyed it.

The people of Warsaw fought the Nazis again in 1944, but they lost. The Nazis then destroyed most of the city.

After the war Warsaw was rebuilt. By the end of the 20th century the city's population was larger than it had been before the war.

► More to explore

Holocaust • Nazi Party • Poland

Washington

The U.S. state of Washington is called the Evergreen State because of its great fir, pine, and hemlock forests. It is also sometimes called the Chinook State, after a Native American tribe of the Columbia River area. Washington is the only state named after a president—George Washington. Olympia is the capital.

Geography

Washington lies in the northwestern United States. On the north the state borders the Canadian province of British Columbia. Idaho is to the east, and Oregon is to the south. The Pacific Ocean lies to the west. Puget Sound is an arm of the Pacific that reaches into the state.

The greatest physical feature of Washington is the Cascade Range, or the Cascades. This mountain chain has the highest point in the state, Mount Rainier. It rises 14,410 feet (4,392 meters). The Cascades divide Washington into two parts. About one third of the state lies west of the Cascades. The area around Puget Sound is a lowland where more than half of the state's people live. Much of the land east of the Cascades is high, flat land called a plateau. The main river in Washington is the Columbia.

The climate in western Washington is wet and mild. Eastern Washington is much drier, with hot summers and cold winters.

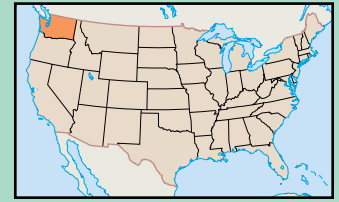
People

During the 1800s many settlers came to Washington along the route called the Oregon Trail. Most of them were from the Midwest. Immigrants from Canada and northern Europe arrived later.

Today whites make up about four fifths of Washington's population. Hispanics and Asians are the largest minority groups. More than 90,000 Native Americans live in the state, too.

Economy

Washington's economy depends mostly on manufacturing and services. The Boeing Company makes aircraft and spacecraft in a huge factory near Seattle. The Microsoft Corporation, in Redmond, is a leader in the production of computer software. Service industries such as real estate and tourism grew quickly in the late 20th century.



Facts About WASHINGTON

Flag



Population

(2000 census)
5,894,121—
rank, 15th state;
(2008 estimate)
6,549,224—
rank, 13th state

Capital

Olympia

Area

71,300 sq mi
(184,665 sq
km)—rank, 18th
state

Statehood

November 11,
1889

Motto

Alki (By and By)

State bird

American
goldfinch



State flower

Coast
rhododendron



The snowy peaks of Washington's Mount Rainier attract mountain climbers.

Other industries in Washington include the making of wood products and the processing of seafood and farm products. The main farm goods are apples, dairy products, and cattle. Fishing boats bring in salmon, crabs, and other seafood.

History

Native American tribes lived in the Washington region long before white settlers arrived. They included the Chinook, the Salish, and the Yakima. In 1792 both Great Britain and the United States claimed the region. The U.S. claim was strengthened in 1805, when the explorers Meriwether Lewis and William Clark arrived.

The region's early settlers made their living mainly by fur trading. Beginning in 1826 logging camps and sawmills were established. In 1846 Britain and the United States signed a treaty that set the border between Canada and the

United States. In 1853 the U.S. Congress established the Washington Territory north of the Columbia River. Washington became the 42nd state in 1889.

In the 1890s a gold rush in Alaska spurred the growth of cities and shipping ports on Puget Sound. Early in the 1900s Washington began projects to improve navigation and create power plants on the Columbia River. The Bonneville and Grand Coulee dams were built in the 1930s and 1940s.

In the second half of the 1900s the Seattle area became famous for the manufacture of airplanes and other high-technology products. Microsoft has been a major force in the state's economy since the 1980s.

► More to explore

Lewis and Clark Expedition • Olympia
• Oregon Trail

Washington, Booker T.

Booker T. Washington was an educator who spoke for many African Americans during the late 1800s and early 1900s. Washington taught that hard work and patience were the best ways for them to improve their lives.

Booker Taliaferro Washington was born into slavery in Franklin County, Virginia, on April 5, 1856. Washington and his mother gained their freedom in 1865, after the end of the American Civil War. They moved to Malden, West Virginia. At age 9 Washington started working to help support the family.

Washington taught himself the alphabet and studied at a local school. He later attended the Hampton Normal and



Booker T. Washington

Agricultural Institute. After graduating in 1875 he became a teacher.

In 1881 Washington was selected to head a new school for African Americans in Alabama. The school was called the Tuskegee Normal and Industrial Institute. It had few students, only two buildings, and very little money. By 1915 Washington had built the institute into a university with about 1,500 students and almost 200 teachers.

During this time, although slavery had ended, African Americans still did not have the same rights that white people had. Washington wanted African Americans to win the respect of whites by learning farming skills and trades, such as brickmaking, mattress making, and wagon building. This, he said, would gradually break down the divisions between the two races.

Washington had many African American followers, but W.E.B. Du Bois and other leaders disagreed with him. These leaders believed that African Americans should protest and fight directly for more rights.

Many whites admired and honored Washington. He became one of the most powerful African American leaders of his time. Washington died in Tuskegee, Alabama, on November 14, 1915.

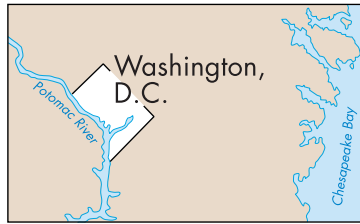
► More to explore

African Americans • Du Bois, W.E.B.

Did You Know?

Booker T. Washington told his own story in a famous book titled *Up from Slavery*.

Washington, D.C.



Population
(2000 census),
city, 572,059;
(2007
estimate),
588,292

The city of Washington is the capital of the United States, a country in North America. It was named after George Washington, the country's first president. He helped plan the city.

Washington is not part of a state. Rather, it is in a separate district called the District of Columbia. The city is thus known as Washington, D.C. The city and the district take up the same space.

Washington lies on the Potomac River. The state of Maryland surrounds the city on all other sides. The state of Virginia lies across the river from Washington to the southwest.



The U.S. Congress meets in a building called the Capitol. The Capitol sits on Capitol Hill in Washington, D.C.

Places of Interest

The most important U.S. government buildings are arranged around a broad lawn in Washington called the Mall. These buildings include the Capitol, where U.S. laws are made, and the White House, where the U.S. president lives. The city also has more than 300 monuments and statues. Among them are memorials honoring war veterans and former U.S. presidents George Washington, Abraham Lincoln, and Thomas Jefferson.

The Smithsonian Institution operates many large national museums in Washington. The city is also home to the world's largest library, the Library of Congress.

Economy

The economy of Washington depends heavily on government activity and tourism. The U.S. government is the largest employer. Many large national and international organizations also have headquarters in the city. Business services, research, law, health care, and other services are also important.

History

Washington is one of the world's few cities built to be a national capital. George Washington chose its location in 1790. An engineer named Pierre-Charles L'Enfant designed the city.

The U.S. government offices were moved to Washington in 1800. During the War of 1812 British troops burned

the White House and other buildings in Washington. They were rebuilt.

The population of Washington doubled after the American Civil War ended in 1865. Many freed slaves moved to the city. In the 1900s the city continued to grow.

In 2001 terrorists crashed airplanes into buildings outside Washington and in New York City. Many people were killed. After that the United States increased security around many government buildings.

► More to explore

Congress of the United States • United States • United States Government
• Washington, George • White House

Washington, George

George Washington led the American colonists to victory in the American Revolution. After the war he helped produce the U.S. Constitution. Finally, he served as the first president of the United States. Washington is often called the Father of His Country.

Early Life and Career

George Washington was born in Westmoreland County, Virginia, on February 22, 1732. He was the eldest child of Augustine and Mary Ball Washington. His father owned plantations, businesses, and mines. After his father died, George lived with his half brother Lawrence at an estate on the Potomac



George Washington was the first president of the United States.

River called Mount Vernon. George learned how to survey (measure) areas of land and to farm.

At age 16 Washington joined a group sent to survey the Virginia frontier. In 1749 he became the official surveyor of Culpeper County. After Lawrence's death in 1752, Washington became head of Mount Vernon and one of the richest planters in Virginia. Slaves did most of the work on his estate.

Beginning in 1754 Washington fought in the French and Indian War. He eventually became commander of all Virginia's troops. Washington also served in the House of Burgesses, Virginia's assembly of representatives. In 1759 he married Martha Dandridge, a widow with two children. The couple had no children together.



TIMELINE

Washington is born in Westmoreland County, Virginia.

Great Britain surrenders.

Washington becomes the first U.S. president.

Washington dies at Mount Vernon.

February 22, 1732

1775

1781

1787

1789

1797

December 14, 1799

Washington leads the Continental Army into the American Revolution.

Washington heads the Constitutional Convention.

Washington retires to Mount Vernon.

American Revolution

Before the American Revolution Washington was loyal to Great Britain. By the late 1760s, however, he began protesting unfair British policies. In 1774 and 1775 Washington served in the Continental Congress. In April 1775 fighting between British and colonial troops began. The Continental Congress chose Washington to lead the colonial forces, called the Continental Army.

The fighting lasted for six difficult years. The army's lowest point was the winter of 1777–78, which it spent at Valley Forge, Pennsylvania. Many soldiers died from the cold, and more than 2,000 deserted. Washington held the army together, however, and continued fighting. Finally, in 1781, the British surrendered.

Presidency

In 1787 Washington served as president of the Constitutional Convention.

There, representatives designed the new U.S. government, laid out in a document called the Constitution. After the states accepted the Constitution, a group of men called electors chose Washington to be the country's first president. Washington took the oath of office in New York City on April 30, 1789. He was reelected in 1792. John Adams was his vice president.

Washington believed in a strong federal, or central, government. He also believed that the United States should remain neutral, or not take sides, in foreign affairs. Political parties developed because of his views. The Federalists, such as Alexander Hamilton, supported Washington's ideas. The Democratic-Republicans, such as Thomas Jefferson, defended the power of the states. Washington tried to keep a balance between the two parties.

Another problem faced by Washington was finding ways to pay the expenses of

the new government. Congress passed taxes on certain products, including whiskey. In 1794 farmers in Pennsylvania rebelled against the whiskey tax. Washington sent about 13,000 soldiers to end the rebellion. His actions showed the power of the federal government.

Retirement and Death

After eight years as president, Washington refused to run for a third term. He retired to Mount Vernon in March 1797. On December 14, 1799, he died of a throat infection. In 1800 the U.S. capital was moved from Philadelphia to the new city of Washington, D.C., named in honor of the first president.

► More to explore

Adams, John • American Revolution • Continental Congress • French and Indian War • United States • United States Constitution

Wasp

Wasps are insects related to bees and ants. There are more than 20,000 species, or types, of wasp. Yellow jacket and hornet are common names for several wasp species.

Wasps live on every continent except Antarctica. They are plentiful in tropical areas.

Wasps vary in color and size. Yellow jackets and hornets are black and yellow. Other wasps may have green, blue, or red markings. Some species measure up to 2.5 inches (6 centimeters) long. Others are among the world's smallest



A potter wasp constructs a nest out of mud.

insects. Wasps usually have two pairs of clear wings and six legs. Females often have a powerful stinger.

Some wasps live in groups called colonies. These insects are called social wasps. A female known as the queen starts the colony. She builds a paperlike nest and lays eggs in it. Her first batch of offspring gathers food and works to make the nest bigger.

Most types of wasp do not form colonies. They are known as solitary wasps. They may build nests in the ground, lay eggs inside plants, or even sneak their eggs into the nests of other insects.

Many people fear the sting of wasps. However, wasps usually sting only people who swat at them or touch their nest. In fact, wasps can be helpful. They feed many troublemaking insects to their young. They also help to spread pollen when they visit flowers to drink nectar. Spreading pollen allows flowers to make seeds.

► More to explore

Ant • Bee • Insect

Watch

▶ see Clock.

Water

Water is the most important liquid on Earth. It covers almost 75 percent of Earth's surface in the form of oceans, rivers, and lakes. All plants and animals need water to live.

People have many uses for water besides drinking. They use it for washing and cooking. They use it to irrigate crops and lawns, to clean streets, and to operate air-conditioning units and heating systems. They also use the power of flowing water to produce electricity.

Makeup and Physical States

Water is made of tiny units called molecules, which are combinations of even smaller units called atoms. A molecule of water is made of two hydrogen atoms



Everyone should drink water every day. Water makes up about 60 percent of an adult's body by weight. Children's bodies have an even higher percentage of water.



River water gushes down rapids. Liquid water can flow freely. Water also occurs as a solid, called ice, and as a gas, called steam or water vapor.

and one oxygen atom. The scientific formula for water is H_2O .

Water can be found in three physical states: liquid, solid (ice), or gas (steam or vapor). The molecules in all three states are constantly moving. The speed of this movement determines water's physical state. In ice, the water molecules vibrate but basically stay in place. In liquid water, the molecules move more quickly but stay near each other. In vapor, the molecules move so quickly that they fly away in all directions.

Heat causes water to change from one physical state to another. When ice is heated, the water molecules move faster and farther apart. This causes the ice to melt into liquid. When liquid water is heated, the molecules speed up even more. Molecules at the surface of the liquid begin to break loose and fly into the air. In this way the liquid evaporates, or becomes vapor.

This process also works in reverse. Cooling temperatures slow down the molecules so that vapor turns back into liquid. Very cold temperatures turn liquid into ice.

Boiling and Freezing

Boiling is the formation of bubbles of vapor inside liquid. As water boils, the bubbles of vapor rise to the surface and escape into the air. At most places on Earth, freshwater boils when it reaches 212°F (100°C). Once it reaches this temperature, the water cannot get any hotter. Any heat added to the water just causes more water to evaporate.

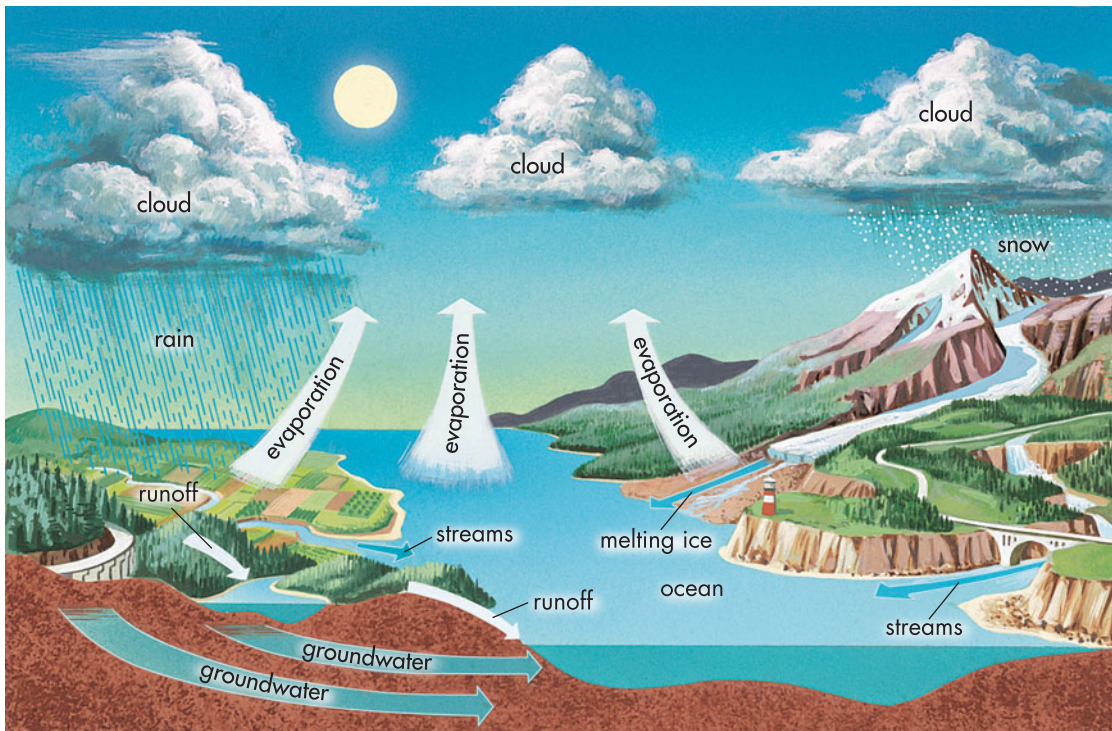
Freezing is the transformation of liquid water into ice. Freshwater freezes at

32°F (0°C). Water is lighter as a solid than as a liquid. This is why ice floats and why it forms on top of a lake instead of at the bottom. Water also expands when it freezes. This is why water pipes can burst on very cold nights. The water inside the pipes pushes outward as it turns into ice.

The Water Cycle

Water on Earth is always moving. It moves from Earth's surface into the atmosphere and then returns to the surface. This movement is called the water cycle.

The sun, air, and gravity work together to create the water cycle. Heat from the sun causes water to evaporate from the



Most of Earth's water is in the oceans. But water is constantly being recycled. Through a process called evaporation, water moves from Earth's surface into the air as water vapor. The vapor can form clouds, which make rain and snow. Rain and snow bring water back to the ground again and into lakes, streams, and oceans. Some of the water seeps underground, where it is called groundwater.

surface of lakes, streams, oceans, and plants. The water vapor moves into the atmosphere. In the cool air high above the ground, the water vapor changes into droplets of water. Large groups of these droplets are called clouds. Gravity pulls the droplets back to Earth as rain. The rain falls into oceans and lakes, enters rivers, and seeps into the ground.

► **More to explore**

Cloud • Evaporation and Condensation
• Lake • Molecule • Ocean • Rain
• River

Waterfall

A waterfall is a place in a river where water spills suddenly downward. Waterfalls are known for their beauty and awesome power.

The world's tallest waterfall is Angel Falls, in Venezuela. Its water plunges 3,212 feet (979 meters). Angel Falls and other large waterfalls are sometimes called cataracts. Cataracts often drop straight down. The falling water may not even touch the rock behind it.

Smaller or less steep waterfalls may be called cascades. Cascades often fall over a number of short rock walls.

The action of flowing river water is one of the most common causes of waterfalls. Flowing water wears away the rock in a riverbed. Riverbeds sometimes contain areas of hard rock and areas of soft rock. In these cases the river wears away the soft rock before the hard rock. The hard rock that is left creates a steep wall.



Havasu Falls is a scenic waterfall in the Grand Canyon.

The river water plunges over the rock wall, forming a waterfall.

Waterfalls also form as a result of movements in Earth's crust. These movements can cause huge blocks of rock to rise or drop. This creates rock walls over which rivers may fall. Large, moving sheets of ice called glaciers also can cut away rock to form waterfalls.

► **More to explore**

River • Rock

Water Lily

Water lilies are plants that grow in still or slowly moving water. They like ponds, streams, and the edges of lakes in tropical and mild areas. Their floating leaves are often called lily pads. Frogs like to sit on them.

Did You Know?

Niagara Falls is the best-known waterfall in North America. It is partly in Canada and partly in the United States.

Water lilies grow from the muddy bottom of a body of water. Thick underwater stems are buried in the mud. Long stalks reach up from the stems to support the round, waxy leaves. Some leaves grow to 6 feet (2 meters) across. The leaves usually float on the surface, but sometimes they are underwater.

A single flower blooms at the end of each stalk. The flowers are shaped like stars or cups. They can be white, cream, pink, yellow, red, orange, purple, or blue. Some flowers open only in the morning. Others open only in the evening. For example, the Egyptian lotus has white flowers that bloom in the night and stay open only until midday.

Water lily plants also produce a fruit. It looks like a nut or a berry. Inside are seeds. When the fruit opens the seeds sink or float away to produce new plants.

Water lilies provide shade and hiding places for fish and other water animals. Fish, ducks, and other animals eat them,

too. Some people grow water lilies in garden ponds.

► More to explore

Frog • Plant

Weapon

A weapon is an object used to harm or kill living creatures or to destroy property. Individual people and armed forces use weapons to defend themselves or to attack an enemy. People also use weapons for hunting.

Early Weapons

The first weapons were things such as stones and wooden clubs. Early peoples used such objects to protect themselves and to hunt for food. Later, ancient people made weapons out of bronze and iron. They developed special swords, spears, and bows and arrows for warfare.

Ancient people also invented special weapons to get past the thick walls of cities and castles. Catapults were weapons that hurled objects over the walls. Battering rams were large wooden beams that could break down doors and walls.

During the Middle Ages (about AD 500 to 1500) Europeans began to use more complex and deadlier weapons. By the 900s they were using powerful crossbows that released arrows with a trigger. In the 1300s they developed large guns called cannons. These weapons were powered by gunpowder, an explosive mixture of chemical substances. (The Chinese had developed gunpowder hun-

Did You Know?

Poisonous chemicals and deadly germs can be made into weapons called chemical and biological weapons.



Water lilies bloom in the water. The plant's leaves float on top of the water.



The crossbow was a powerful weapon that could shoot a bolt (short arrow) as far as 1,000 feet (300 meters). At close range it could shoot through a knight's armor.

dreds of years before.) In a cannon, exploding gunpowder shot a heavy stone or metal ball out of a tube.

Modern Weapons

In the mid-1400s the Spanish invented the first gun that could be fired from a man's shoulder. It was called a *harquebus*. A larger shoulder gun, called a *musket*, replaced the *harquebus* in the 1500s. The first pistols, or handheld guns, also came into use at this time.



A powerful military rifle has two supports to hold it steady. A small telescope, or *scope*, helps the soldier to take aim.

Rifles came into wide use in the 1800s. Bullets shot from a rifle spin around as they travel. This makes shots fired from rifles very accurate. In the mid-1800s the first successful machine guns also began to be made. Machine guns could quickly fire many bullets in a row.

Armed forces used many deadly new weapons during World War I (1914–18) and World War II (1939–45). Some of these included tanks, poison gas, flamethrowers, and missiles (rockets that carry explosives to a target). Airplanes also played a major role in these wars because they could drop explosive weapons called bombs.

The deadliest weapon ever used was the atomic bomb, a kind of nuclear weapon. World War II ended after the United States dropped two atomic bombs on Japan. More than 100,000 Japanese people were killed.

Weapons Today

Today armed forces continue to use guns, missiles, bombs, and other modern weapons. Police officers in many countries carry clubs, handguns, rifles, or stun guns. (Stun guns use electrical shocks to stop people from moving.)

► More to explore

Army • Bomb • Nuclear Energy • Police • Rocket • War

Weasel

Weasels are meat-eating mammals that are excellent hunters. They are closely related to mink, ferrets, and wolverines.



The stoat, or short-tailed weasel, has mostly brown fur in summer. In winter the fur may turn white.

Weasels live on every continent except Australia and Antarctica. There are about 10 species, or types, of weasel. The least weasel lives in Europe, Asia, and North America. The long-tailed weasel is common in North America and South America.

Weasels have very long, thin bodies. The neck is long and flexible. Weasels usually have brown fur. Some species turn white during winter.

Weasels are small animals. Not including its tail, the long-tailed weasel is about 10 to 12 inches long. It weighs 3 to 12 ounces (85 to 350 grams). The least weasel is the smallest living carnivore, or meat-eater. It weighs only 1 to 2.5 ounces (30 to 70 grams). The least weasel is about 6 to 8 inches (15 to 20 centimeters) long.

Weasels hunt alone at night. They move quietly and use scent to track their prey. They also have very good hearing. Weasels usually eat mice, rats, fish, and frogs.

Many weasels are valued for their skins and furs. Tail hair from some weasels is used to make paintbrushes.

► More to explore

Mammal • Mink • Wolverine

Weather

Weather is the daily state of the atmosphere, or air, in any given place. It is different from climate. Climate is the average of weather conditions in an area over a long period.

Elements of Weather

Many different elements combine to create weather. Temperature is one of the basic elements of weather. Temperature is how warm or cold it is outside.

Wind, or the movement of air across Earth's surface, is a second element of weather. Winds may be gentle or very powerful.

A third element of weather is humidity, or the amount of moisture in the air. Warm air can hold more moisture than cold air can.

Precipitation is a fourth element of weather. Precipitation may come in many forms, including rain, hail, sleet, and snow. The form precipitation takes depends on other weather conditions, such as temperature.

A fifth element of weather is atmospheric pressure. This is the weight of air above a given area. Changes in pressure help people to predict approaching

Did You Know?

Scientists sometimes try to control weather. For example, they may add chemical particles to clouds in order to cause raindrops to form.



A meteorologist, or weather scientist, studies computer images of a hurricane. Meteorologists study satellite images of storms to find out how strong they are and which way they are headed.

storms. A storm is a disturbance in the atmosphere—for example, a thunderstorm or a hurricane.

Meteorology

Meteorology is the scientific study of weather. People who study and predict weather are called meteorologists.

Meteorologists use many instruments to gather information about weather. The thermometer and the barometer are two of the oldest and most common weather instruments. The thermometer measures temperature, and the barometer measures atmospheric pressure. Another common instrument is the wind vane, which shows the direction in which winds are blowing.

Today satellites in space collect weather information worldwide. Computers help meteorologists to track weather patterns and to make weather forecasts, or predictions.

► More to explore

Climate • Rain • Snow • Storm • Wind

Wellington



Population

(2007 estimate), urban area, 379,100

Wellington is the capital of New Zealand, an island country in the South Pacific Ocean. The city is New Zealand's cultural center. It is located on the coast of North Island. The city and its port lie on a bay called Port Nicholson, one of the world's finest harbors.

Many people in Wellington work for the government or in service industries such as trade, health care, education, or com-



A cable car carries people between downtown Wellington, New Zealand, and the Wellington Botanical Garden.

munications. The city is New Zealand's center of business and banking. The tourism and film industries also bring money to Wellington. Factories in the city make cars, furniture, plastics, and other products.

The Maori people have lived in the Wellington area for hundreds of years. Great Britain took control of New Zealand in the 1800s. The British founded Wellington in 1840. The capital of New Zealand was moved from Auckland to Wellington in 1865. New Zealand became an independent country in 1947. Wellington remained its capital.

► **More to explore**
New Zealand

Wells-Barnett, Ida B.

Ida B. Wells-Barnett was a writer and public speaker in the United States during the late 1800s and early 1900s. Her speeches and writings tell a shocking story of how whites killed African Americans in attacks called lynchings.

Early Life

Ida Bell Wells was born on July 16, 1862, in Holly Springs, Mississippi. Her parents were slaves. Wells's family gained their freedom after the American Civil War ended in 1865.

Wells was about 16 years old when both her parents died. Wells then looked after



Ida B. Wells-Barnett

the rest of her family. She taught school to earn money.

Career

As a young woman, Wells moved to Memphis, Tennessee. There she fought racial segregation—the forced separation of the races. In 1884 she refused to leave a railroad car that was reserved for whites. One of the railroad workers dragged her from the car. Wells began writing articles against segregation in African American newspapers. She soon became a part owner of a newspaper.

Wells started writing about lynching in 1892. White Southerners used lynching as a weapon of terrorism against African Americans. Mobs of whites would seize and murder African Americans, often by hanging. Police usually made no arrests. Wells wrote and spoke in public about lynchings so that people would know

what had really happened. She wanted people to become angry and put a stop to lynching.

Some whites disliked Wells's antilynching articles so much that they destroyed her newspaper office. Wells eventually moved to Chicago, Illinois, where she married Ferdinand L. Barnett in 1895.

Later Life

Besides fighting lynching, Wells-Barnett worked for women's right to vote. She also helped to found the National Association for the Advancement of Colored People. Wells-Barnett died in Chicago on March 25, 1931.

► More to explore

African Americans • National Association for the Advancement of Colored People

Western Australia

Western Australia is Australia's largest state. It covers nearly one third of the country. However, only about 10 percent of Australia's people live there. The



Formations of limestone thrust upward through the sand of the Pinnacles Desert in Western Australia.

state capital is Perth, a city on the southwestern coast.

Geography

Western Australia borders the Indian Ocean on the south, west, and northwest. The Timor Sea makes up its northern coast. The Northern Territory and the state of South Australia lie to the east. Western Australia covers an area of 976,790 square miles (2,529,875 square kilometers).

The Fitzroy and Ord rivers flow through the northern part of the state. South of the rivers is the Great Sandy Desert. Other deserts, the Gibson and the Great Victoria, cover the central part of the state. Mountains rise in parts of the west. Mount Meharry, in the northwest, is Western Australia's highest point. It rises 4,104 feet (1,251 meters) above sea level.

Several different climate areas are found in Western Australia. The northern section is warm throughout the year, with a

wet and a dry season. The southwest has cool, mild winters and warm, breezy summers. Hot, dry winds blow from the desert areas to the east.

People

Western Australia has a population of nearly 2 million. Most people have British, Irish, or other European ancestors. A small number of people have Asian roots. Australia's native people, called Aborigines, make up about 3 percent of the population.

Most people live in the southwestern quarter of the state. More than 1 million people live in Perth. Albany, a much smaller city on the southern coast, has the state's only good harbor. Other cities include Kalgoorlie-Boulder, Bunbury, and Geraldton.

Economy

Many Western Australians work in services such as education, health care, and retail (shops). A smaller number of people work in manufacturing. Workers produce steel, furniture, food products, and other goods.

Mining is also important to the economy. Western Australia is rich in valuable minerals, including gold, diamonds, nickel, iron, coal, tin, uranium, and bauxite. The state also has major deposits of oil and natural gas.

Western Australia has little freshwater and poor soil, so growing crops is hard. Farmers mainly produce grains, wool, and mutton (sheep meat). They also grow grapes for wine.

History

Aborigines have lived in what is now Western Australia for at least 40,000 years. In 1616 the Dutch explorer Dirck Hartog became the first European to land on the coast. The British made the first lasting settlement in 1826, at Albany. The British made the land a colony. They later sent thousands of prisoners to work in the colony.

In the 1880s people discovered gold in southern Western Australia, and settlers poured in. Western Australia became a state of the new country of Australia in 1901.

► More to explore

Aboriginal Peoples • Australia • Great Victoria Desert

West Indies

The West Indies is a group of islands that stretches from near the U.S. state of Florida to the northern coast of South America. The islands separate the Caribbean Sea from the rest of the Atlantic Ocean. People also call this area the Caribbean.





Charlotte Amalie, on the island of Saint Thomas, is a port for tourist ships. The city is the capital of the U.S. Virgin Islands, in the West Indies. Tourism is important to the economies of many islands in the region.

Greater Antilles

A group of large islands in the northwestern Caribbean is known as the Greater Antilles. The Greater Antilles include Cuba, Puerto Rico, Jamaica, and Hispaniola. Two countries share the island of Hispaniola: Haiti and the Dominican Republic.

Lesser Antilles

The Lesser Antilles are smaller islands that lie southeast of the Greater Antilles. The northern Lesser Antilles are also known as the Leeward Islands. They include the British and U.S. Virgin Islands, Anguilla, Saint Martin, Saint Kitts and Nevis, Antigua and Barbuda, Montserrat, and Guadeloupe.

South of the Leewards are the Windward Islands. The Windward Islands include Dominica, Martinique, Saint

Lucia, Saint Vincent and the Grenadines, and Grenada.

Aruba, the Netherlands Antilles, and Trinidad and Tobago also belong to the Lesser Antilles. These islands are close to the coast of South America.

Other Islands

Several other islands lie outside the Antilles groups. The Bahamas are east and southeast of Florida. The Turks and Caicos Islands are southeast of The Bahamas. The Cayman Islands are northwest of Jamaica. Barbados lies east of the Windward Islands.

Foreign Ties

There are many independent countries in the West Indies. However, many other islands have ties to foreign countries. Puerto Rico and the U.S. Virgin Islands have ties to the United States. The British Virgin Islands, the Turks and Caicos Islands, the Cayman Islands, Anguilla, and Montserrat have ties to Great Britain. The Netherlands



The red-billed tropicbird is a seabird of the West Indies. The islands of the region have a rich variety of native birds, including parrots, hummingbirds, doves, and pigeons.

Antilles and Aruba have ties to The Netherlands. Guadeloupe and Martinique are parts of France. The Netherlands and France each control a part of Saint Martin.

History

Between 200,000 and several million Native Americans lived in the region before Europeans arrived in 1492. In that year Christopher Columbus landed on several islands in the West Indies. He probably landed first on an island in The Bahamas, then Cuba, and finally Hispaniola. Columbus thought he was in Asia, in the area now called the East Indies. Therefore, he called the people on the islands Indians.

Europeans soon controlled all of the West Indies. Haiti won independence from France in 1804. By 1902, the Dominican Republic and Cuba were independent, too. Most of the other countries in the West Indies gained independence in the second half of the 1900s.

► More to explore

Antigua and Barbuda • Bahamas, The
• Barbados • Caribbean Sea • Cuba
• Dominica • Dominican Republic
• East Indies • Grenada • Haiti
• Jamaica • Puerto Rico • Saint Kitts and Nevis • Saint Vincent and the Grenadines • Trinidad and Tobago

West Nile Virus

West Nile is a virus that kills many types of birds. It also infects humans and other mammals. Most human infections

are mild, but some are deadly. For years West Nile virus was found mostly in the Middle East, Africa, and western Asia. In the 1990s it spread to Europe and the United States.

West Nile virus is spread from bird to bird through mosquito bites. Mosquitoes also carry the virus from birds to mammals. The virus does not pass from one person to another.

Only about one out of every five people infected with West Nile virus becomes ill. The symptoms, or signs, of illness start 3 to 14 days after infection. They include fever, headache, muscle aches, vomiting, and skin rash. These symptoms generally last a few days.

A small number of people infected with the virus become seriously ill. This mostly happens to people over the age of 50. In these people the virus reaches the brain, causing a condition called encephalitis. Symptoms of encephalitis include severe headache, high fever, neck stiffness, muscle weakness, and confusion. A person with encephalitis may become paralyzed or die.

There is no cure for infection with West Nile virus. The best way to keep from getting infected is to avoid being bitten by mosquitoes. Treatment focuses on relieving the symptoms. In severe cases people need to stay in a hospital for treatment.

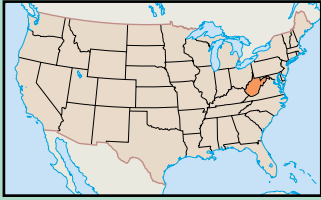
► More to explore

Encephalitis • Virus

Did You Know?

The first human case of West Nile virus was found in 1937 in the West Nile district of Uganda, a country in Africa.





West Virginia

The U.S. state of West Virginia was created during the American Civil War. In 1861 the state of Virginia voted to withdraw from the Union. But leaders from the state's northwestern counties rebelled and set up their own government. This division of Virginia lasted until June 20, 1863, when West Virginia became the 35th state of the Union.

West Virginia is nicknamed the Mountain State because of its rugged landscape. Charleston is the capital.

Geography

West Virginia is in the east-central part of the United States. It is bordered on the north by Pennsylvania and Maryland. Ohio and Kentucky lie to the west. Virginia is to the east and south.



Sandstone Falls are part of the New River Gorge National River in southern West Virginia. The river is part of the national park system.

All of West Virginia lies within the Appalachian Mountains. It is a state of forested hills and mountains separated by narrow valleys. The Allegheny Mountains, a section of the Appalachians, have the highest peaks. Many of them are more than 4,000 feet (1,200 meters) high. The Great Kanawha, Little Kanawha, Monongahela, and Shenandoah rivers cross the state.

West Virginia has a humid climate with warm summers and cold winters. The Alleghenies are the wettest part of the state. The mountains are often foggy.

People

The first European settlers in what is now West Virginia were Germans. Later came English and Scots-Irish settlers. In the late 1800s many European immigrants came to West Virginia to work in coal mines.

West Virginia's population today is about 95 percent white. African Americans are the largest minority group. They make up about 3 percent of the population.

Economy

Mining has been the traditional basis of West Virginia's economy. The state is rich in natural resources, including coal, natural gas, oil, and salt. But the mining industry decreased beginning in the late 1970s. Service industries, such as tourism, sales, and health care, helped the state's economy improve in the 1990s. Another boost to the economy was the transfer of government jobs to the state from Washington, D.C. Growth in the timber industry was important as well.

History

European explorers in the West Virginia region found Shawnee, Iroquois, and



Glass objects are on display at a museum in Huntington, West Virginia. The state has many glass-making factories because it has a great deal of sand, which is the main ingredient of glass.

Cherokee tribes already living there. In 1726 the first lasting European settlement was established in the northeast. The English controlled the region during the 1750s and 1760s. Though eastern Virginia was rapidly settled, the west's rugged land limited settlement there. After the American Revolution (1775–83), mostly nonslaveholding settlers moved west.

The Western part of Virginia was always different from the east. The land in the west was so mountainous that there were few plantations, or large farms, there. This meant that there was little need for slave labor. Eastern Virginia, however, had many plantations. Virginia broke away from the Union in 1861 to join the Confederacy with other slave states. Soon after that, the northwestern counties broke away from Virginia. In June 1863, while the American Civil War (1861–65) was being fought, these counties joined the Union as the new state of West Virginia.

After the Civil War, industry grew rapidly in the state. West Virginia's raw materials helped the growth of industry in other states as well. The state's population increased steadily up to 1950. After that, however, many people left West Virginia in search of jobs. Unemployment soared again in the 1980s, and almost one tenth of the population moved away. The population increased slightly by the year 2000.

► More to explore

American Civil War • Appalachian Mountains • Charleston

Facts About WEST VIRGINIA

Flag



Population

(2000 census)
1,808,344—
rank, 37th state;
(2008 estimate)
1,814,468—
rank, 37th state

Capital

Charleston

Area

24,230 sq mi
(62,755 sq km)—
rank, 41st state

Statehood

June 20, 1863

Motto

*Montani Semper
Liberi*
(Mountaineers
Are Always Free)

State bird

Cardinal



State flower

Rhododendron



Wetland



Marsh grasses grow in a saltwater marsh. Marshes and swamps can form in fresh-water or salt water.

Wetlands are areas where the land does not drain well. The ground in a wetland is saturated, or full of water. Often the ground is covered with shallow water.

Wetlands are usually classified as swamps, marshes, or bogs. The different types of wetlands have different kinds of soil and plants. Both swamps and marshes have soils that contain many minerals. They differ in their plant life. Most of the plants in swamps are trees, but marshes have grassy plants. Bogs differ from swamps and marshes because their soil has few minerals. Only mosses and a few other types of plants can grow in bogs.

Wetlands play a major role in the environment. They are home to a great vari-

ety of plants and animals. A wetland system can also protect shorelines, cleanse polluted waters, prevent floods, and restore underground water supplies.

► More to explore

Bog • Marsh • Swamp

Whale

Whales are large animals that live in water. Whales may look like fish, but they are mammals. They breathe air and produce milk for their young. Whales make up an order, or large group of animals, called Cetacea. The order includes dolphins and porpoises.

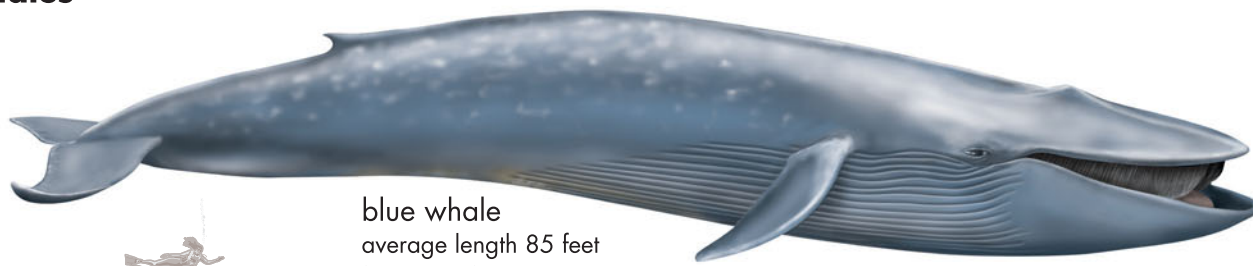
Toothed and Baleen Whales

There are two basic kinds of whale: toothed and baleen. Toothed whales have sharp teeth and eat mainly fish and squid. There are about 70 species, or types, of toothed whale. These include the sperm whale, the beluga, the killer whale, the narwhal, beaked whales, and



Humpback whales are very acrobatic. They often leap out of the water and then arch backward as they fall back down. They make a loud slapping sound when they hit the surface.

Whales



blue whale
average length 85 feet
(26 meters)



fin whale
average length 75 feet
(23 meters)



killer whale, or orca
average length 26 feet (8 meters)



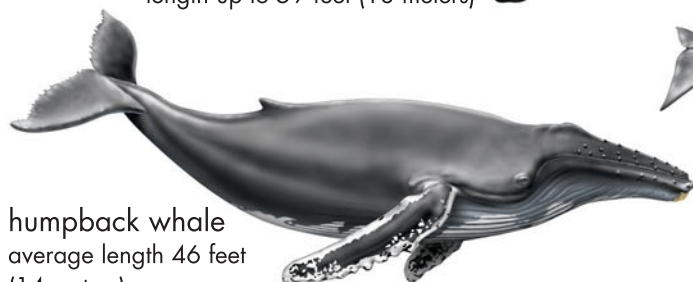
sei whale
average length 46 feet
(14 meters)



bowhead, or Greenland right whale
length up to 66 feet (20 meters)



northern right whale
length up to 59 feet (18 meters)



humpback whale
average length 46 feet
(14 meters)



gray whale
length up to 49 feet (15 meters)



narwhal
average length 13 feet
(4 meters)



sperm whale
length up to 62 feet (19 meters)



There are about 80 species, or types, of whale. The blue whale is the largest of all.

pilot whales. Dolphins and porpoises also belong to this group.

There are about 10 species of baleen whale. These include the blue whale, the gray whale, the fin whale, the humpback whale, the sei whale, and right whales. Baleen whales do not have teeth. A baleen whale feeds either by swimming with its mouth open or by gulping water. A series of filters in the mouth called baleen acts as a strainer. The baleen lets water out but holds in small fishes, shrimps, and other creatures.

Where Whales Live

Whales live in oceans and seas all over the world. Some species can be found in rivers. Large species often migrate, or travel from one place to another, at certain times of the year. Some types travel thousands of miles.

Physical Features

Whales are generally more than 10 feet (3 meters) long. Several species, mainly baleens, may be 60 feet (18 meters) long or more. The blue whale is the largest animal that has ever lived. It may be more than 100 feet (30 meters) long.

Whales are usually black, gray, black and white, or white. Some types are bluish gray. A whale's skin is smooth. A thick layer of fat, called blubber, beneath the skin protects the animal from cold water.

A whale's torpedo-shaped body helps it to move quickly through the water. It

pushes its tail up and down to move. The tail is divided into two broad sections called flukes. These extend horizontally (side to side) instead of vertically (up and down), as the fins of a fish do. A whale also uses two flippers on the front of its body for steering.

Whales go to the surface of the water to breathe. A whale takes in air through one or two openings, called blowholes, on the top of the head.

Behavior

Many kinds of whale, especially toothed whales often can be found in groups called schools or pods. These groups can range in size from a few animals to more than 1,000. Baleen whales are more likely to live alone or in small schools.

Whales make many sounds—including whistles, barks, and screams—to communicate with other whales. Toothed whales also make special sounds to locate objects they cannot see. These sounds bounce off solid surfaces and travel back to the whale's sensitive ears. This process is called echolocation.

Life Cycle

About one year after mating, a female whale gives birth to a single baby, or calf. She nurses her calf for a number of months. Some types of whale may live for 100 years or longer.

► More to explore

Dolphin • Fish • Mammal • Porpoise

Did You Know?

For many years people hunted whales for the oil in their blubber. People used whale oil as fuel and to make soap. Today whale hunting is very limited.

Wheat

Wheat is a very important grain. It is a major source of nutrients for people. More of the world's farmland is devoted to wheat than to any other food crop. Wheat belongs to the grass family.

People first grew wheat as early as 9,000 years ago in the Middle East. Today China, India, and the United States are leading wheat producers.

There are thousands of kinds of wheat. Wheat plants grow to between 2 and 5 feet (0.6 and 1.5 meters) tall. Most types have a hollow stem. At the end of the stem is a structure called a head, or spike. The spike is made up of 20 to 100 tiny flowers. These flowers produce the seeds, or kernels, of wheat. Wheat kernels vary in color depending on the type of wheat. Some are dark reddish brown. Others are brown, tan, white, cream, or yellow.

Farmers harvest wheat using a machine called a combine. The combine cuts down the plants. Then it separates the seeds from the rest of the plants.

Most wheat is used to make food for people. Whole or coarsely chopped wheat kernels are cooked and used in cereals and soups. But wheat is more commonly used in the form of flour. To make flour, the kernels are cleaned and then crushed into tiny pieces. Wheat flour is used to make bread, cakes, crackers, cookies, and pasta.



Golden spikes of wheat are ready to harvest.

Wheat is also used to feed livestock. The dried plants are used as straw for animal beds.

► More to explore

Grain • Grass

Wheatley, Phillis

Phillis Wheatley was the first African American to write a book. Her book of poetry was published in 1773. Wheatley proved to many people that blacks were equal to whites in creative ability.

Phillis Wheatley was born in West Africa. Her date of birth and her African name are not known. A slave ship took her to Boston, Massachusetts, in 1761. She was then about 8 years old. A couple named John and Susanna Wheatley bought her. They gave her their own last name.

Wheatley quickly learned to speak, read, and write English. In 1767 a newspaper



A statue in Boston, Massachusetts, honors Phillis Wheatley.

published one of her poems. Three years later Wheatley wrote another poem to honor a clergyman named George Whitefield. The poem was published throughout the North American colonies and in England. Wheatley became famous.

By 1772 Wheatley had written enough poems to fill a book. Susanna Wheatley helped Phillis to publish the book in England. The book was called *Poems on Various Subjects, Religious and Moral*. Wheatley traveled to England in 1773. The English welcomed her as a famous author, though she was still a slave. Wheatley gained her freedom when she returned from England.

Some of Wheatley's poems could not be published in England because they supported American independence. Her

most famous patriotic poem is *To His Excellency, General Washington*.

In 1778 Wheatley married John Peters, a free black man. She had three children with him. Wheatley was working as a servant when she died on December 5, 1784.

► More to explore

African Americans • Poetry

Whippoorwill

The whippoorwill is a North American bird that is nocturnal, or active at night. It is named for its call—three whistled notes that sound like “whip-poor-will.” It may repeat this call 400 times without stopping.

Whippoorwill is in the same scientific family as nightjars and nighthawks. They are also related to owls. The scientific name of the whippoorwill is *Caprimulgus vociferus*.

Whippoorwill live in woodlands. They can be found in southeastern Canada, in the eastern and southwestern United States, and in Mexico. They may spend the winter as far south as Costa Rica.

The whippoorwill is about 9.5 inches (24 centimeters) long. It has spotted brownish and grayish feathers. The bird has very short legs and large eyes. Its bill is small, but its mouth can open very wide. The corners of the male's tail are white. The male also has a thin band of white feathers around the neck.



A whippoorwill rests on a log. The bird's color helps it blend in well with the wood.

Around dawn and dusk the whippoorwill swoops across the sky, searching for insects to eat. By day it sleeps on the forest floor or perches lengthwise on a branch.

► More to explore

Bird • Owl

White House

The president of the United States lives and works in the White House. The president's family lives there also. The White House is in Washington, D.C., at 1600 Pennsylvania Avenue N.W. Its walls are made of sandstone and painted white.

Layout

The president uses part of the White House for social events. The biggest room, called the East Room, is where dances and large gatherings take place. The State Dining Room is only slightly smaller. As many as 140 people can sit down to eat there. The Red, Blue, and Green rooms are named for the colors

that were used to decorate them. All these rooms are on the first floor.

The second and third floors contain private living space for the president, the president's family, and the president's guests. The family and guests can enjoy the White House's movie theater, swimming pool, tennis court, jogging track, and library. In addition, the White House has its own doctor's office, dentist's office, and barber shop.

The West and East wings of the White House connect with the main building. They contain offices for government workers. The office of the president—called the Oval Office—is in the West Wing. The office of the vice president is also in the West Wing. The East Wing holds other offices, including those of the first lady (the president's wife) and her staff.

History

The first president of the United States—George Washington—did not



The White House is the official residence of the president of the United States. It is one of the best-known sites in the U.S. capital, Washington, D.C.



The Green Room is one of the public rooms on the first floor of the White House.

live in the White House. It had not been built yet, and Washington, D.C., did not exist when he was elected. The capital at the time was New York City. During Washington's first term the capital was moved to Philadelphia. In 1790 the U.S. Congress chose the area that is now Washington, D.C., to be the site of the new permanent U.S. capital. In 1792 an architect named James Hoban drew up plans for a house where the president could live. The house was not ready until 1800. John Adams was the first president to live there.

In 1814, during the War of 1812, British soldiers entered Washington, D.C. They set a fire that damaged the inside of the White House. Workers finished making repairs in 1817.

In 1902 workers built the West Wing to make office space. In 1942 workers built

the East Wing to make even more space. From 1948 to 1952 much of the interior of the building was rebuilt. The outside walls were not changed. Over the years several presidents and their wives have redecorated the rooms of the White House. Today the public can tour parts of the main building.

► More to explore

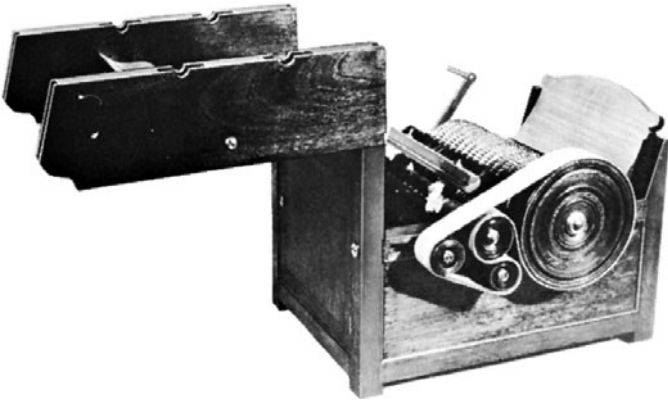
War of 1812 • Washington, D.C.

Whitney, Eli

Eli Whitney was one of the first great inventors in the United States. He invented the cotton gin, which helped to make cotton the most important crop of the Southern states. He also invented methods of producing many goods quickly and cheaply. Factories still use these methods, called mass production, today.

Eli Whitney was born in Westboro, Massachusetts, on December 8, 1765. He graduated from Yale College in 1792. He then moved south to Georgia.

Many farmers in Georgia grew cotton. Whitney found out that they had no easy way to separate cottonseeds from cotton fiber so that the cotton could be used. Whitney solved the problem by inventing a machine called the cotton gin (short for "engine"). The cotton gin was an immediate success. Farmers were able to produce far more cotton each year. Between 1793 and 1800, U.S. cotton production rose from about 3,000 bales (bundles) a year to 73,000 bales a year.



Eli Whitney invented a machine called a cotton gin in 1793. The machine had a set of wire spikes set on a revolving cylinder, or drum. As the cylinder turned around it pulled raw cotton through the spikes. The spikes combed the seeds from the cotton and left the fibers.

Whitney also had ideas about how to make things in factories. He first used these ideas to make guns for the U.S. government. Before his time, one skilled worker made all the parts of a gun by hand and then fitted them together. Whitney used machines to make many copies of each part. He then hired unskilled workers to put the parts together. Whitney's factory made guns faster and more cheaply than ever before. His ideas changed the way factories made all kinds of products. Whitney died in New Haven, Connecticut, on January 8, 1825.

► More to explore

Cotton • Technology and Invention

Wichita

The Wichita are Native Americans of Oklahoma. They once lived in what is now Kansas. The city of Wichita, the

largest city in Kansas, was named after the tribe.

The Wichita traditionally grew corn, pumpkins, beans, squash, and tobacco. They also hunted deer, antelope, bear, and bison (buffalo). The Wichita lived in round houses that looked like haystacks. They built their homes by covering a wood frame with grass. While hunting the Wichita lived in cone-shaped tents called tepees, which they carried from place to place. They made the tepees with animal skins.

Spanish explorers arrived in Wichita lands in the middle of the 1500s. At that time the Wichita lived near the Arkansas River in what is now Kansas. By the early 1700s they had moved south to Indian Territory (now Oklahoma). French explorers met the tribe there. The Wichita became allies and trading partners of the French.



A photograph from the 1870s shows a Wichita man named Esadewar.

In the late 1700s war with the Osage Indians forced the Wichita to move farther south, into what is now Texas. During the American Civil War (1861–65) the Wichita returned to Kansas. In 1867 they moved to a reservation in Indian Territory. At the end of the 20th century there were about 1,500 Wichita living in the United States, mostly in Oklahoma.

► **More to explore**

Native Americans

Wilder, Laura Ingalls



Laura Ingalls Wilder

Laura Ingalls Wilder wrote children's books about pioneer life in the United States. She based her famous "Little House" stories on her own childhood on the American frontier.

Laura Elizabeth Ingalls was born on February 7, 1867, in Pepin, Wisconsin. She had three sisters. During her child-

hood she and her family moved often from one part of the frontier to another. They lived in Minnesota, Iowa, Missouri, Kansas, Indian Territory (now Oklahoma), and Dakota Territory (now North and South Dakota).

At age 15 Laura began teaching in country schools to help support the family. In 1885 she married Almanzo J. Wilder.

While in her 40s Wilder began writing articles for magazines. The Wilders' only daughter, Rose, liked hearing stories about her mother's youth. When Rose became an adult, she asked her mother to write down her tales of growing up on the frontier. From 1932 to 1943 Ingalls published six books in the "Little House" series. They included *Little House in the Big Woods* and *Little House on the Prairie*.

Wilder died in Mansfield, Missouri, on February 10, 1957. The American Library Association honored her in 1954 by creating the Laura Ingalls Wilder Medal. The award is given to outstanding writers and illustrators of children's books.

► **More to explore**

Pioneer Life

Williams, Venus and Serena

Venus and Serena Williams are sisters who play tennis. They won many important tournaments from 1999 to the early 2000s. The two sometimes



Serena (left) and Venus Williams show the trophies they won at the 2001 U.S. Open tennis tournament.

teamed up to win doubles (two against two) championships. Each sister won several singles championships as well. In 2002 they were the top two women tennis players in the world.

Venus Williams was born on June 17, 1980, in Lynwood, California. Serena was born on September 26, 1981, in Saginaw, Michigan. The sisters' father, Richard, taught them to play tennis when they were very young.

The Williams sisters both became professional tennis players at about age 14. Being professional means that they earned money for playing. In 1999 Serena won the U.S. Open, a major tennis tournament.

In 2000 Venus won another of the major tournaments, this one in Wimble-

don, England. She and Serena won the women's doubles competition at Wimbledon as well. Later that year Venus won the U.S. Open for the first time. She and Serena won the gold medal for doubles at the 2000 Olympics. In 2001 Venus won both Wimbledon and the U.S. Open again.

In 2002 Serena beat her sister at the French Open, Wimbledon, and the U.S. Open. She became the number-one player in the world. In 2003 Serena beat Venus at Wimbledon and the Australian Open. The Australian Open victory gave her wins in all four of the major tournaments. Both sisters won many more titles after that. They won their second doubles gold medal at the 2008 Olympic Games.

► More to explore

Tennis

Willow

The name willow applies to a wide variety of shrubs and trees. There are more than 300 species, or types, of willow. One of the most familiar is the weeping willow. This large tree has drooping branches and twigs. The pussy willow is another member of the willow family. It is a bush that has silvery white, furry buds on its branches in the spring.

Willows grow in North and South America, Europe, and Asia in generally cool areas. Most grow near rivers, lakes, or swamps. Willow trees have tough, deep roots. They help to keep the soil of the coastline from washing away.

Did You Know?

The furry buds of a pussy willow are called catkins. Catkins are clusters of tiny flowers. All willows grow catkins.



The weeping willow tree is usually found near water.

Willows vary greatly in size and shape. They may be low shrubs that grow just a few inches above the soil. Some are large trees that reach more than 100 feet (30 meters) in height. The bark may be gray, brown, or nearly black. The leaves are narrow and green. On some trees the twigs are bright yellow, orange, or red.

Willow wood is used to make products such as tool handles, baseball bats, and furniture. A substance in some willow bark is also used to make pain medicine.

► More to explore

Tree

Wilson, Woodrow

Elected in 1912, Woodrow Wilson was the 28th president of the United States. He led the country through World War I. Afterward he helped create the League

of Nations, an international peace organization.

Early Life and Career

Thomas Woodrow Wilson was born on December 28, 1856, in Staunton, Virginia. His parents were Joseph Ruggles Wilson, a Presbyterian minister, and Janet Woodrow. The Wilsons moved to Augusta, Georgia, after their son's birth.

Wilson graduated from Princeton University in 1879. In 1886 he earned an advanced degree in government and history from Johns Hopkins University. Four years later Wilson returned to Princeton as a professor. In 1902 he became president of Princeton.

In 1885 Wilson married Ellen Louise Axson. They had three daughters. Ellen died in 1914. Wilson married Edith Bolling Galt in 1915.



Woodrow Wilson was the 28th president of the United States.



TIMELINE

Wilson is born in Staunton, Virginia.

December 28, 1856

Wilson is elected president.

1912

Wilson is elected governor of New Jersey.

1910

1917

The United States enters World War I.

World War I ends.

1918

Wilson retires from office.

1921

Wilson dies in Washington, D.C.

February 3, 1924

Political Career

In 1910 Wilson was elected governor of New Jersey. In 1912 the Democratic Party chose him to run for president. Wilson faced two opponents in the election: President William Howard Taft and former president Theodore Roosevelt. Wilson won the election.

Presidency

Wilson successfully pushed Congress to pass a number of laws. One law introduced an income tax. Another law created the Federal Reserve System, a powerful economic agency. Other laws regulated business and stopped child labor.

In foreign affairs, revolution in Mexico caused problems for Wilson. In 1916 the Mexican rebel Pancho Villa crossed the border and killed about 17 people in New Mexico. Wilson sent U.S. forces into Mexico, but they failed to catch Villa.

World War I

In 1914 World War I began in Europe. Wilson kept the United States neutral, meaning it did not take sides. After winning reelection in 1916, Wilson tried to end the war through peace talks. In early 1917, however, German submarines began attacking neutral ships. In April Wilson asked Congress to declare war.

In May 1917 Congress passed the Selective Service Act, which gave the government the right to order U.S. citizens to join the military. The 2 million U.S. soldiers sent to France helped defeat the Germans. The war ended on November 11, 1918.

Making Peace

Wilson attended the peace conference in Paris, France, after the war. He hoped to include his Fourteen Points, or 14 ideas for peace, in the agreement. The Treaty of Versailles, signed in 1919, left out many of Wilson's ideas. However, it

included the League of Nations, an organization to maintain world peace.

When Wilson presented the treaty to Congress, Republicans rejected it. They especially opposed the League of Nations. The league held its first meeting in 1920 without the United States.

Later Years

Working on the treaty left Wilson exhausted. He had a medical emergency called a stroke in October 1919, but he stayed in office until March 1921. He died in Washington, D.C., on February 3, 1924.

► More to explore

League of Nations • Roosevelt, Theodore • Taft, William Howard • United States • Villa, Pancho • World War I

Wind

Wind is the movement of air near Earth's surface. Wind can be a gentle



A strong winter wind blows snow and bends trees.

breeze or a strong gale. The most powerful wind happens during storms called tornadoes, cyclones, and hurricanes.

Changes in the temperature of air, land, and water cause wind. When air flows over a warm surface, it heats up and rises. This leaves room for cooler air to flow in. The flowing air is wind.

Winds are named after the direction from which they come, not the direction toward which they blow. For example, wind blowing from west to east is called a westerly.

Winds greatly affect the weather. They bring cool air into warm areas. They also can bring rain, snow, or even dust and sand. For example, in southern Asia winds known as monsoons bring rain during the summer. This happens because cool, moist air from over the ocean moves in over the warm land.

Large movements of air around Earth are called planetary winds. Some of the best-known planetary winds are the tropical easterlies, or trade winds. The trade winds are two large belts of wind on either side of the equator. They blow steadily toward the west.

Since early times people have harnessed the power of wind. Early sailors relied on the planetary winds to travel across oceans. Early peoples also built windmills, or machines that used wind power to turn stones or other machines to grind grain. Today people use

windmills to power machines that create electricity.

► More to explore

Air • Earth • Weather

Windhoek



Population
(2001 estimate)
216,000

Windhoek is the capital of Namibia, a country in southern Africa. It is Namibia's largest city by far. A ring of hills surrounds the city.

The economy of Windhoek is very important to Namibia. Windhoek is the country's main center of trade, banking, industry, and transportation. Factories in the city make such products as cloth, clothing, leather goods, and processed foods.

The first settlers in what is now Windhoek were the Khoekhoe and Herero peoples. The town was once called Aigams, meaning "hot water." The name referred to the region's natural hot springs, where steaming-hot water spouts from the ground. Europeans later changed the name to Windhoek.

Germany took over the town in the late 1800s. South Africa took control of



German colonists designed some of the buildings of Windhoek, Namibia, to look like buildings in Germany. Modern buildings now rise nearby.

Windhoek and the rest of Namibia in 1915. In 1990 Namibia became an independent country with Windhoek as its capital.

► More to explore

Namibia

Windmill

A windmill is a machine that harnesses the power of the wind. Windmills may be used to grind grain into flour, to pump water, or to produce electricity.

A windmill has a number of blades that spin around when wind blows on them. The blades are mounted on a tall tower or building. They are connected to a vertical shaft, or rod. When the blades spin, they turn the shaft. The turning shaft powers a device that does work—for example, a water pump or millstones, which grind grain. The shaft also may provide power to a machine called a generator, which produces electricity.



Windmills on a hillside in California are used to generate electricity.

People in western Asia built the earliest known windmills more than 1,000 years ago. They used these windmills to grind grain. Windmills spread to Europe by the 1100s. The Dutch used them to pump water out of low-lying areas near the sea. By the 1800s, however, many people used steam engines rather than wind power to run mills and to do other work. Today modern windmills, called wind turbines, produce electricity for many communities.

► **More to explore**
Machine • Wind

Winnebago

The Winnebago are Native Americans of the midwestern United States. They call themselves Ho-Chunk, which means “people of the first voice.”

The Winnebago traditionally lived in dome-shaped homes called wigwams. They made their wigwams by covering a wood frame with bark. The Winnebago grew corn, squash, and beans. They hunted small animals in the forest. They

also traveled to the prairies to the southwest to hunt bison (buffalo).

The Winnebago knew only other Native Americans until 1634. In that year French explorers arrived in their lands near Green Bay, in what is now eastern Wisconsin. The Winnebago traded with the French for such goods as metal pots and guns. But many Winnebago died from diseases brought by the French, especially smallpox.

By the early 1800s the Winnebago had spread into southwestern Wisconsin and



A Winnebago of Wisconsin weaves a basket in the early 1900s.

northwestern Illinois. In the 1820s and 1830s the U.S. government forced the Winnebago to give up all their land east of the Mississippi River. The government moved the tribe first to Iowa, then to Minnesota, and then to South Dakota. Hundreds of Winnebago died during the moves.

In 1865 about 1,200 Winnebago finally settled on a reservation in Nebraska. In the 1880s half of the tribe returned to Wisconsin. At the end of the 20th century there were about 7,500 Winnebago in the United States. Most still lived in Nebraska or Wisconsin.

► More to explore

Native Americans

Winnemucca, Sarah

Sarah Winnemucca was a Native American speaker and writer. She worked throughout her life to improve the lives of her people, the Paiute. As a writer, she is best known for her book *Life Among the Piutes*, published in 1883.

Sarah Winnemucca was born in about 1844 in what is now Nevada. Her original name was Thocmetony, which means “shell flower.” She was the daughter of a Paiute leader named Old Winnemucca. During Sarah’s childhood white people moved onto Paiute lands.

By age 14 Winnemucca could speak English, Spanish, and several Native American languages. Eventually the U.S.



Sarah Winnemucca

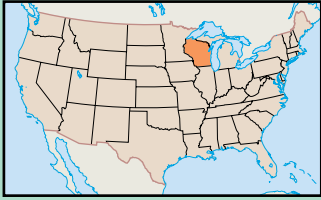
government asked her to be an interpreter between white settlers and Native Americans. An interpreter helps people who do not speak each other’s language to communicate.

During the 1870s the U.S. government forced many of the Paiute to move long distances to reservations (lands set aside for them). In 1879 Winnemucca went to San Francisco, California, to speak out about how her people had been wronged. In the 1880s she gave more speeches in the eastern United States.

As Winnemucca’s fame grew, President Rutherford B. Hayes and other government leaders met with her. They promised to give some land back to the Paiute. However, they did not keep their promises. Winnemucca died on October 16, 1891.

► More to explore

Native Americans • Paiute



Wisconsin

Wisconsin has long been noted for its lakes, rivers, and beautiful rolling hills. The state was named for its main river, the Wisconsin. The name is believed to have come from a Native American word meaning “gathering of waters.” Wisconsin is also known as a center of the dairy industry. The slogan on Wisconsin’s license plates is “America’s Dairyland.” Madison is the state capital.

Geography

Wisconsin is located in the north-central part of the United States. In the north Wisconsin borders Lake Superior and the Upper Peninsula of Michigan. Lake Michigan lies to the east, and Illinois is to the south. The Mississippi and Saint

Croix rivers form most of Wisconsin’s western border with Minnesota and Iowa.

The northernmost part of Wisconsin, along Lake Superior, is a narrow plain. But most of the northern part of the state is a highland region with many lakes. To the south is a plain that stretches across the center of the state. The southwest is a region of ridges and valleys. Wisconsin has long, cold winters and warm summers.

People

In the early 1800s white settlers came to the Wisconsin area from other parts of the United States. In later years immigrants came from Germany, Poland, Scandinavia, and other parts of Europe. The majority of Wisconsin’s people are descendants of these settlers. African Americans are the largest minority group, making up about 6 percent of the population. Hispanics represent almost 4 percent of the population.

Economy

Wisconsin is known as America’s Dairyland because the state has long been a leading producer of milk, butter, and cheese. The state is famous for its cheddar cheese, but it also produces Swiss, Colby, and many other varieties.

Manufacturing and services are Wisconsin’s major sources of income. Many of the state’s factories produce industrial





Cheesemakers work on a large vat of cheese at a plant in Wisconsin. Wisconsin is known for its cheese and other dairy products.

machinery. Others make metal and paper products. The processing of food and the brewing of beer are also major industries.

Service industries such as health care, real estate, and tourism were the fastest-growing part of the state's economy in the late 20th century. Tourism provides more than 300,000 jobs to Wisconsinites. Tourists spend about 9 billion dol-

lars in Wisconsin each year. One popular tourist attraction is Wisconsin Dells, which is famous for its riverside cliffs, sandstone formations, and family vacation spots.

History

Several Native American tribes lived in the Wisconsin area when Europeans arrived. Among them were the Ojibwa (or Chippewa), Potawatomi, and Winnebago (Ho-Chunk).

The French explorer Jean Nicolet landed on the shores of Green Bay in 1634. In 1763, after many wars, France was forced to give the region to Great Britain. After losing the American Revolution (1775–83), Britain gave the land to the United States.

Settlement of Wisconsin was slow until immigrants began arriving from northern Europe in the 1830s. The U.S. Congress made Wisconsin a territory in 1836. In 1848 Wisconsin became the 30th state.

In the second half of the 1800s wheat farming, lumbering, and dairying were Wisconsin's main economic activities. Wheat farming and lumbering eventually became less valuable. In the early 1900s Wisconsin became the country's leading dairy state. Later in the 1900s manufacturing and service industries became important to the state's economy.

► **More to explore**
Madison

Facts About WISCONSIN

Flag



Population

(2000 census)
5,363,675—
rank, 18th state;
(2008 estimate)
5,627,967—
rank, 20th state

Capital

Madison

Area

65,498 sq mi
(169,639 sq
km)—rank, 23rd
state

Statehood

May 29, 1848

Motto

Forward

State bird

Robin



State flower

Wood violet



The modern-looking Quadracci Pavilion of the Milwaukee Art Museum was designed by Spanish architect Santiago Calatrava and completed in 2001.

Woden

► see Odin.

Wolf

Wolves are members of the dog family. They are known for their intelligence and courage. Wolves are also noted for traveling very long distances. North American Indians named their most powerful warriors after wolves.

Where Wolves Live

There are three species, or types, of wolf. The best known is the gray wolf. It lives in North America, Europe, and Asia. The red wolf once lived throughout the southeastern United States. Now most red wolves live in captivity. Some can still be found in the wild in North Carolina. The Ethiopian wolf was once considered a jackal. Many people now believe it is a wolf. It lives in Ethiopia.

Physical Features

The gray, or timber, wolf has long legs and large feet. The males are larger than the females. A male gray wolf usually



Gray wolf, or timber wolf

weighs about 100 pounds (45 kilograms). Including the tail, it may be about 6.5 feet (2 meters) long. The gray wolf's fur is usually gray. It may also be brown, red, white, or black. The legs and belly are yellowish white.

The red wolf weighs 44 to 82 pounds (20 to 37 kilograms). Its coat is reddish brown or sandy colored. The Ethiopian wolf also has reddish brown fur. A male Ethiopian wolf weighs only about 35 pounds (16 kilograms).

Behavior

Wolves are social animals. They live in groups called packs. A wolf pack usually has a pair of adult wolves and their offspring. The male and female leaders are known as the alpha pair. Wolves normally hunt at night in groups. They eat deer, moose, squirrels, and mice.

Survival

All species of wolf are in danger of dying out. This is partly because their habitats are being destroyed. People also kill wolves because the wolves attack cattle. Today there are many programs to protect wolves.

► More to explore

Dog • Jackal

Wolof Empire

The Wolof Empire was an African state that was powerful from about 1200 to the 1550s. The empire covered parts of what is now Senegal, in western Africa.



A king called a *burba* ruled the empire. He also served as the empire's religious leader.

The Wolof people came from what is now the country of Mali in the 1000s. They set up a kingdom soon after 1200. During the 1300s Wolof took over neighboring kingdoms. One of these kingdoms, called Cayor, controlled lands along the coast of the Atlantic Ocean. By the 1400s Wolof had become a powerful empire.

In about 1440 Portuguese traders came to the area. They traded many goods with the Wolof Empire. They also tried to take control of the Wolof people. But the Wolof kept their independence.

In 1556 the Cayor people became independent of the Wolof Empire. They set up a state of their own on the coast. This weakened the Wolof because now they had no way to reach the ocean. As a

result the Wolof were cut off from trade with Europeans.

Over the next 300 years Europeans set up more trading centers along the coast. The power of the Wolof shrank further. During the 1800s the French settled in the Wolof lands and fought the Wolof people. In 1895 the Wolof lands became part of a colony of France.

► More to explore

Empire • Senegal

Wolverine

The wolverine is a mammal of the weasel family. Like its relative the skunk, the wolverine can give off an unpleasant smell. It is sometimes called a skunk bear. Its scientific name is *Gulo gulo*.

The wolverine is found mostly in the northern parts of North America, Europe, and Asia. It is known for its great strength and big appetite.

The wolverine looks like a small, thick-bodied bear. It ranges from about 26 to



The wolverine is a strong animal. It has a thick neck and big claws.

Did You Know?

The scientific name for the wolverine means "glutton," or "big eater," in the Latin language.

36 inches (66 to 91 centimeters) in length and has a long, bushy tail. It can weigh from 20 to 66 pounds (9 to 30 kilograms). The wolverine has short legs and ears, strong teeth, and sharp claws. The thick coat is blackish brown. A light brown stripe runs from each side of the neck down to where the tail starts.

The wolverine lives alone and is usually active at night. It can travel up to 40 miles (64 kilometers) a day looking for food. The wolverine eats small animals that it kills and larger animals that it finds dead. Some wolverines will attack large animals such as sheep and deer. The wolverine has no enemies except for people.

► More to explore

Skunk • Weasel

Women's Rights

In many countries today women have the same rights as men. They have the right to own property. They have the right to get an education. They have the right to work at any job they choose. They have the right to vote. They have the right to be elected president or prime minister of their country. But it has not always been this way. Women called feminists worked for many years to get these rights.

Early Ideas About Women

Through much of history, women have not been treated as equals with men. Women were thought to be naturally weaker and less smart than men. Some



A British poster from the early 1900s backs voting rights for women.

myths and religions even presented women as a source of evil.

For all these reasons, women were not given the same rights as men. But when women were given some freedom, they made important achievements. For example, some women became powerful leaders. Queen Elizabeth I ruled England for 45 years in the 1500s. Catherine the Great was empress of Russia in the 1700s.

In the late 1700s many people in Europe and North America began to speak of individual freedom. They said that people had rights that governments must respect. But they used such phrases as "the rights of man," which some people thought did not include women. During this time some free-thinking women spoke up for women's rights. One of them was the English feminist Mary

Wollstonecraft. She said that women should receive the same opportunities as men in education, work, and politics.

The Right to Vote

Women knew that if they were going to change society they must win suffrage, or the right to vote. In this way they could take part in government. Then they could influence policies and laws.

The United States

In the United States the women's rights movement grew out of the abolitionist, or antislavery, movement. Lucretia Mott and Elizabeth Cady Stanton were abolitionists who also led the first women's rights convention. It was held in Seneca Falls, New York, in 1848.

Stanton and Susan B. Anthony formed the National Woman Suffrage Association in 1869. Lucy Stone formed the American Woman Suffrage Association in the same year. The two groups united in 1890.

The struggle to win the vote was slow. Starting in 1869, some territories and states gave women the vote. But efforts to create a federal law failed again and again. Victory finally came in 1920, when the 19th Amendment to the U.S. Constitution was passed. It gave women the right to vote nationwide.

Around the World

Women in other countries also worked for voting rights. Women gained the vote in New Zealand in 1893, in Australia in 1902, in Finland in 1906, and in Norway in 1913.

In the United Kingdom, Emmeline Pankhurst got women to march in the streets for voting rights. In 1918 British women over age 30 won the vote. In 1928 the age was lowered to 21.

Other countries changed more slowly. Women in Switzerland could not vote until 1971. Even in the 21st century women in some Middle Eastern countries still did not have the right to vote.

The Modern Women's Movement

A new women's rights movement began in the 1960s. This movement was commonly called "feminism" or "women's liberation." Feminists in the United States formed the National Organization for Women (NOW) in 1966.

NOW worked to make the Equal Rights Amendment (ERA) a part of the U.S. Constitution. The amendment would have guaranteed all legal rights, not just



People gather in the late 20th century to demand equal pay for women workers in the United States. The Equal Pay Act of 1963 said that men and women should get equal pay for equal work.



In 1999 Helen Clark became the first woman to be elected prime minister of New Zealand.

voting rights, to women. It died in 1982 because not enough states ratified, or approved, it.

But the women's rights movement still made gains. For example, it helped make birth control available to more women. Birth control gives women greater control over when they have children. Birth control allowed more women to have careers.

Women who chose careers at first faced much unfairness in the workplace. Congress passed laws to help them. The Equal Pay Act of 1963 said that men and women had to get the same pay for doing the same job. The Civil Rights Act of 1964 included equal rights for women as well as for racial minorities. The act made it illegal to set aside some jobs for men and others for women.

Education also became more available to women. By the end of the 20th century

women were earning more than half of all college degrees in the United States.

Many women were elected to government offices, too. Women served as president or prime minister in India, Ireland, Israel, New Zealand, Pakistan, Sri Lanka, the United Kingdom, and many other countries.

► More to explore

Anthony, Susan B. • Mott, Lucretia
• Stanton, Elizabeth Cady • Voting

Woodchuck

► see Groundhog.

Woodpecker

The birds called woodpeckers are known for pecking holes in tree bark to find



A great spotted woodpecker feeds its young. Great spotted woodpeckers live in Europe, Asia, and North Africa.

insects to eat. Most woodpeckers live in forests, spending their lives mainly in trees.

There are about 180 species, or types, of woodpecker. They include the birds called flickers and sapsuckers. Woodpeckers look like songbirds in many ways. But scientists classify woodpeckers in a different grouping, the order Piciformes. They are related to toucans.

Woodpeckers live nearly all over the world. They are most common in South America and Southeast Asia.

Woodpeckers vary in length from about 6 to 18 inches (15 to 46 centimeters). They are often black and white with patches of red or yellow on the head.

Most woodpeckers fly with short swoops. Each of their feet has two toes pointing forward and two toes pointing backward. This helps the birds cling to tree trunks. The strong, rigid tail feathers help the bird hold itself against the tree. The long, sticky tongue helps the bird trap insects.

Most woodpeckers eat insects found in tree bark. The bird uses its bill to tap holes into the bark. This normally does not hurt the trees. In fact, woodpeckers eat insects that are harmful to trees. Some kinds also eat fruit. Sapsuckers also feed on sap, a liquid made by trees. Flickers eat mainly ants on the ground.

Woodpeckers are usually silent, except in spring. Then males call loudly and

drum on hollow wood or even metal. This warns other males to stay away.

► More to explore

Bird • Songbird

Woods, Tiger



Tiger Woods watches the golf ball he has just hit as it moves closer and closer to the hole.

The U.S. golfer Tiger Woods achieved outstanding success at his sport. He began winning golf championships at a very young age. He was just 21 when he first won the Masters Tournament, in 1997.

Woods was born on December 30, 1975, in Cypress, California. His father was African American, and his mother was from Thailand. His first name is Eldrick. His father gave him the nickname Tiger.

Woods first picked up a golf club at the age of 18 months. He won more than

30 junior tournaments before becoming a teenager. At age 15, Woods won his first of three U.S. Junior Amateur titles. He then won three U.S. Men's Amateur titles.

Woods went to college at Stanford University in California. While he was there he became the national college champion. Soon afterward he decided to become a professional (paid) golfer.

The four most important golf tournaments are the Masters, the Professional Golfers' Association (PGA) championship, the U.S. Open, and the British Open. Winning all four during one's career is known as a Grand Slam. In 2000 Woods became only the fifth player in golf history to complete a Grand Slam. At age 24, he was also the youngest.

Because he was so successful, several companies paid Woods to advertise their products. He used some of this money to form a charity to help children.

► **More to explore**
Golf

World Music

The term world music describes types of music that come from places other than the United States or Great Britain.

Therefore, the singers of world music often do not sing in English. But world music is not just one style of music. Different types of music from Africa, Asia,



African musician Youssou N'Dour, from Senegal, sings at the Montreux Jazz Festival in Switzerland.

South America, the Caribbean islands, and Europe all can be called world music.

The first popular examples of world music came from Africa in the 1980s. One of the early African world music stars was King Sunny Ade, from Nigeria. He led a large band that included guitars, drums, and singers. The style was new to people outside Africa, and his records sold well.

Record companies soon began selling more and more world music. Fans liked it because it was different from other styles of popular music. It allowed them to hear music from cultures very different from their own. Some U.S. rock musicians, including David Byrne and Paul Simon, began working with musicians from other countries. In 1990 the music magazine *Billboard* started a world music chart—a list of the top-selling world music albums. In 1991 the first Grammy awards for world music were given.

Did You Know?

Tiger Woods won six straight golf tournaments in 1999–2000. This was the second-longest winning streak in professional golf history.

Popular world music performers have included Cesaria Evora, from Cape Verde; Nusrat Fateh Ali Khan, from Pakistan; and Youssou N'Dour, from Senegal. The Gipsy Kings, from France, and the Buena Vista Social Club, from Cuba, were popular world music groups.

► More to explore

Music • Popular Music

World War I



A poster encouraged British people to join the army during World War I. There was also a U.S. version, in which the man with the pointing finger was a character called Uncle Sam.

World War I lasted from 1914 to 1918. It was known at first as the Great War and the War to End All Wars. It was the largest war that the world had seen up to that time. Most of the battles took place in Europe and the Middle East. More than 8 million soldiers and sailors died, and more than 20 million were injured.

The war was so bad that many people thought no one would ever start another war. However, the results of World War I helped to cause World War II, which broke out in 1939.

War Breaks Out

A murder in the city of Sarajevo led to the war. Sarajevo was the capital of Bosnia, a region of the Austro-Hungarian Empire. On June 28, 1914, a Bosnian who was loyal to the country of Serbia shot and killed the Austro-Hungarian emperor's nephew, Archduke Francis Ferdinand. Austria-Hungary accused Serbian government workers of planning the crime.

On July 28 Austria-Hungary declared war on Serbia. Both countries asked for help from their friends. Austria-Hungary's friends were Germany and Italy. Their group was called the Triple Alliance. Serbia was a small country, but Russia protected it. Russia's friends were France and the United Kingdom (Great Britain). Their group was called the Triple Entente.

Within a few weeks most of the countries of Europe were at war. Both sides soon got new names. The Triple Alliance became the Central Powers, and the Triple Entente became the Allies. Italy did not go to war at first.

The Western Front

Battlefields west of Germany were called the Western Front. The Germans had hoped for an easy victory on the Western Front. But in September 1914 the

Did You Know?

Gavrilo Princip was the name of the Bosnian who killed Archduke Francis Ferdinand.

Allies forced back the Germans at the battle of the Marne, a river in France.

The armies on the Western Front then began four years of trench warfare. Each side dug long trenches into the ground. The soldiers stayed in these trenches for protection. A “no-man’s land” covered with barbed wire lay between the trenches. Both sides used rapid-firing machine guns against anyone who tried to get across the no-man’s land.

Soldiers fought two of the war’s worst battles on the Western Front in 1916. The battle of the Somme took place

near the Somme River in France from July to November. More than 600,000 Allied soldiers were killed, wounded, captured, or missing. They gained only about 5 miles (8 kilometers) of ground. The French and the Germans fought another long battle near the French town of Verdun in 1916.

Both sides tried new ways to break through trench defenses. The Germans used a poison gas called chlorine against Allied troops in April 1915. Both sides then tried other chemical weapons. Soldiers got gas masks for protection against them. The British invented an



Almost all the battles of World War I were fought in Europe and the Middle East. The two sides fighting each other were known as the Allies and the Central Powers. Countries that did not side with either group were called neutral.



African American troops served in the trenches of the Western Front during the last years of World War I.

armored car called a tank. Tanks had crawler tracks to move them through trenches and barbed wire. The British first used tanks in 1916.

The Eastern Front and the Middle East

Battlefields east of Germany were called the Eastern Front. Armies moved faster on the Eastern Front. In 1914 Russian armies pushed west into Germany and Austria-Hungary. In 1915 the Germans drove them back. Bulgaria then joined the Central Powers. The troops of Germany, Austria, and Bulgaria took Serbia. An Allied force landed at Salonika (now Thessaloníki) in Greece to help the Serbians. However, the Allies made little progress until the end of the war.

At the end of 1914 the Ottoman Empire (centered in what is now Turkey) joined the Central Powers. The Ottomans attacked Russia. British, Australian, and New Zealand troops tried to

stop the Ottomans on Turkey's Gallipoli Peninsula, but they failed.

In 1915 Italy joined the Allies. The Italians lost many soldiers fighting the Austrians.

When the war began, the Ottoman Empire ruled Syria, Palestine, and Mesopotamia (now Iraq). In 1915 British-led troops tried and failed to take Baghdad (now the capital of Iraq). In March 1917 they finally succeeded. Later that year, the British took Palestine. In 1918 they took Syria as well.

The War at Sea

The British had more and better warships than the Germans. The British Navy was able to stop some ships from reaching German ports. Such an action is called a naval blockade.

However, the British were not able to stop German submarines. In 1915 the Germans announced that they would try to sink all enemy ships in British waters. On May 7, 1915, a German submarine sank the British passenger ship *Lusitania*. Nearly 1,200 people died, including many U.S. citizens.

The submarine attacks hurt the United Kingdom. By April 1917, one of every four supply ships that left the country never returned. By the end of that month, the country had only a six weeks' supply of grain left.

The Allies tried to defend their supply ships by putting guns on them. They also had them sail in convoys, or groups,

Did You Know?

German submarines were called U-boats. The term was short for "undersea boat" (*Unterseeboot* in German).

protected by warships. In all, German submarines caused the loss of about 6,000 Allied ships. The United Kingdom alone lost 13,000 lives in these attacks.

The War in the Air

The airplane had been invented only 11 years before the war began. At first Germany used floating aircraft called zeppelins, rather than airplanes, to bomb the United Kingdom. Then the British built anti-aircraft guns to shoot down the zeppelins.

During the war both sides built several kinds of warplanes. Fighter airplanes had machine guns to shoot at other airplanes. In 1917 the Germans started dropping bombs from airplanes. In the United Kingdom these bombings killed about 1,300 people and injured about 3,000.



Fighter pilots got into battles called dog-fights as they tried to shoot each other down.

Events of 1917

The Russian Revolution in 1917 changed the Eastern Front. A group called the Bolsheviks took over Russia in November. They made peace with the Central Powers almost immediately. The Germans were then able to move their troops elsewhere.

Meanwhile, the United States entered the war on the side of the Allies. President Woodrow Wilson at first did not want to go to war. He changed his mind because Germany kept attacking U.S. supply ships. The United States also found out that Germany had promised to give Texas, New Mexico, and Arizona to Mexico in return for Mexico's help in the war. The United States declared war on Germany on April 6, 1917.

The Tide Turns

During the winter of 1917–18, there were more German soldiers than Allied soldiers on the Western Front. In 1918 the situation changed, as nearly 10,000 U.S. troops landed each day in France. By November, the Allies had driven back the Germans to the battle lines of 1914.

The Central Powers started surrendering. The Bulgarians gave up on September 29, 1918. On October 30 the Austrians asked for a cease-fire (an end to fighting). The Ottomans gave up on the same day.

By this time, the German people were starving. The naval blockade was keeping food shipments from reaching the country. On November 11, 1918, Ger-

man government leaders signed an armistice—an agreement that ended the fighting.

The Peace

The Allies met in January 1919 and wrote a document called a peace treaty. The treaty allowed Germany to keep only a small army and navy. Germany was also forced to pay a large amount of money to the Allies. In addition, the treaty started the League of Nations, an organization that was supposed to prevent future wars.

German and Allied representatives signed the Treaty of Versailles on June 28, 1919. (Versailles is a town near Paris, France.) Separate treaties made peace with Austria, Bulgaria, and the Ottoman Empire. However, the U.S. Senate refused to ratify, or agree to, the Treaty of Versailles. Some senators were against the treaty because they did not like the League of Nations.

The Allies' dreams of peace did not last long. The German people did not like being punished. They brought Adolf Hitler to power in 1933. He built up the German military and started to conquer neighboring countries. The League of Nations could not stop him. His actions led to World War II.

► More to explore

Bosnia and Herzegovina • Europe
• France • Germany • Italy • League of Nations • Lusitania • Ottoman Empire
• Russian Revolution • Sarajevo
• United Kingdom • Wilson, Woodrow

World War II

World War II started in 1939. By the time it ended in 1945, the war involved nearly every part of the world. The two sides that fought the war were called the Axis powers and the Allies. Germany, Italy, and Japan were the major Axis powers. The major Allies were the United States, the Soviet Union, the United Kingdom (Great Britain), and France. China also aided the Allies.

More people died in World War II than in any other war. Experts guess that 40 to 50 million people lost their lives. Many were civilians (people not fighting the war). About 6 million were victims of the Holocaust—a German plan to kill people that they thought were inferior.

Events Leading to War

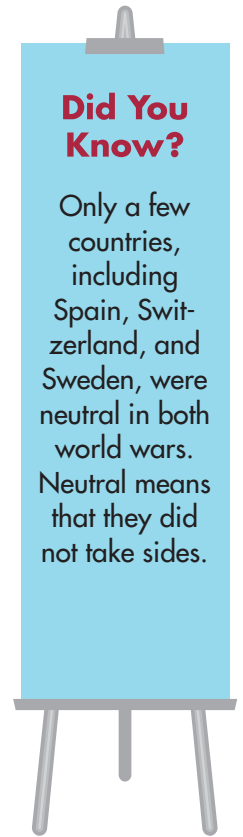
Japan, Italy, and Germany all committed warlike acts in the 1930s. In 1931 Japan began an invasion of China. Italy, led by Benito Mussolini's Fascist Party, conquered the East African country of Ethiopia in 1935.

Germany was the biggest threat to world peace. Adolf Hitler and his National Socialist, or Nazi, Party wanted Germans to rule over everyone else. In March 1938 German troops marched into Austria.

Hitler next wanted a part of Czechoslovakia where German-speaking people lived. Great Britain and France agreed to let him have it. They hoped to satisfy

Did You Know?

Only a few countries, including Spain, Switzerland, and Sweden, were neutral in both world wars. Neutral means that they did not take sides.



Hitler so that he would make no more demands. Their plan—called appeasement—was a failure. Within six months Germany took control of all of Czechoslovakia.

Hitler then planned to take over Poland. Britain and France promised to help Poland in case Germany attacked it. Germany prepared for war by making peace with the Soviet Union (which was not yet on the Allies' side) in August 1939. Germany did not want to fight Britain, France, and the Soviet Union all at the same time.

War with Germany Begins

Poland

On September 1, 1939, Germany invaded Poland. This began World War II. The Germans used a new kind of attack. They called it blitzkrieg, or “lightning war.” Blitzkrieg relied on fast-moving tanks and warplanes to shock the enemy into surrendering.

After this invasion, Britain and France declared war on Germany. Australia, New Zealand, Canada, India, and South Africa joined Britain on the side of the Allies. But no one could help when the Soviet Union attacked Poland on September 17. Germany and the Soviet Union divided Poland between them. The Soviet Union also invaded Latvia, Lithuania, Estonia, and Finland during 1939.

Scandinavia and the Low Countries

Between April and June 1940 the Germans took over Norway and Denmark.

In May they moved into the Low Countries—Belgium, The Netherlands, and Luxembourg.

France

In mid-May 1940 the first German troops crossed into France. By June 14 the Germans had entered Paris, the French capital.

On June 22 France agreed to let Germans rule most of their country. However, many French people continued to fight the Germans. They were called the Free French. They took orders from Charles de Gaulle. De Gaulle's headquarters were in Britain.

As France was falling to the Germans, Italy declared war against France and Britain. On June 10, 1940, Italy entered the war as an Axis power.

Great Britain

Hitler's next target was the island of Great Britain. Starting in June 1940,



Firefighters try to control the damage from a German bombing attack on London, England, in 1941, during World War II.

German warplanes began bombing Britain. However, the British had a new invention called radar. Radar warned the British when German aircraft were nearing. British fighter airplanes shot down many attackers. This battle, called the battle of Britain, was the world's first major battle fought in the air.

The Germans soon decided not to invade Britain. Instead, they dropped more bombs on London and other cities until May 1941.

The Atlantic Ocean

The British also fought the German navy in the Atlantic Ocean. Early in the

war, German submarines sank many of the supply ships that delivered food and weapons from North America. In 1943 the Allies began to use aircraft carriers to protect convoys, or groups, of supply ships. Using radar to spot enemy submarines also helped the Allies. The number of supply ships reaching Britain started to increase in mid-1943.

North Africa

In the autumn of 1940 the Italians invaded Egypt. They wanted to control the Suez Canal, which linked the Mediterranean Sea to the Red Sea and the Indian Ocean. However, the British drove the Italians back.



Then the German general Erwin Rommel led the Germans to victories in North Africa. In 1942 British forces finally stopped Rommel in two battles at El-Alamein, Egypt. By November 6 the British had driven the Germans from Egypt.

The Soviet Union

After conquering the countries on Germany's borders, Hitler invaded the Soviet Union. The attack began on June 22, 1941. The Soviet Union joined the Allies soon afterward. The Soviets stopped the Germans on the edges of Moscow (the Soviet capital) and Leningrad (now Saint Petersburg).

In 1942 Hitler decided to take the Soviet city of Stalingrad (now Volgograd). The fight at Stalingrad was the largest single battle in World War II.

About 1.9 million soldiers died on both sides. The Germans surrendered in January 1943. After Stalingrad, the Soviets gradually drove out the Germans.

War with Japan Begins

Great Britain, France, and The Netherlands ruled many islands in the Pacific Ocean. They ruled much of Southeast Asia as well. With these countries now at war, Japan saw an opportunity to take away their colonies. The Japanese began by taking French Indochina (now Laos, Cambodia, and Vietnam) in 1940 and 1941.

Pearl Harbor

On the morning of December 7, 1941, Japanese warplanes attacked U.S. warships at the Pearl Harbor naval base in Hawaii. They sank or crippled eight big battleships, destroyed more than 180





During World War II, many U.S. women worked in factories that made warplanes and other products. They took the places of men who were fighting the war.

aircraft, and killed more than 2,000 Americans.

The Pearl Harbor attack brought the United States into the war. Within a few days, the United States was at war with Germany and Italy as well.

The Philippines

Japan also bombed the Philippine Islands, which were a U.S. possession. U.S. and Philippine forces fought until the Japanese defeated them. The Philippines surrendered in May 1942. Japan also conquered Singapore, the Netherlands Indies (now Indonesia), and Burma (now Myanmar).

Coral Sea and Midway

The battles of the Coral Sea and Midway stopped the Japanese push. In the Coral Sea, near Australia, the Allies

stopped a Japanese attack on the island of New Guinea in May 1942. In June, near the tiny island of Midway in the North Pacific Ocean, U.S. airplanes destroyed many of Japan's ships. However, Japan still controlled a vast area.

End of the War with Germany

North Africa and Italy

In November 1942 Allied forces landed in Morocco and Algeria in North Africa. They defeated German and Italian forces in May 1943.

The Allies followed up their North African successes by invading Italy. Soon afterward, Italians overthrew Mussolini. Italy surrendered in September 1943. However, German troops still held most of the country. The Allies took Rome, the capital, on June 4, 1944.

D-Day and Battle of the Bulge

June 6, 1944, is called D-Day. On that day, 156,000 troops from the United



U.S. troops waded to shore on D-Day, June 6, 1944. Their goal was to drive the Germans out of France.

States, Britain, and Canada attacked the beaches of Normandy in northern France. After fierce fighting, the Allied armies moved inland. They freed Paris on August 25.

The Allies then moved toward Germany. The Germans made one last attack on the Allies in December 1944. The Germans lost this fight, called the battle of the Bulge, by January. In March 1945 the Allies drove into western Germany.

Germany Surrenders

By February 1945 it was clear that Germany would lose the war. The Allied leaders—U.S. president Franklin D. Roosevelt, British prime minister Winston Churchill, and Soviet premier Joseph Stalin—met in Yalta (now in Ukraine). There they made plans for Europe after the war.

Meanwhile, Soviet troops pushed through Germany from the east. By



Winston Churchill (left) of the United Kingdom, Franklin D. Roosevelt (center) of the United States, and Joseph Stalin (right) of the Soviet Union met in Yalta (now in Ukraine) in February 1945 to make plans for postwar Europe.

April 25 the Soviets had surrounded Berlin, the German capital. Hitler killed himself on April 30. Germany surrendered at midnight on May 8, 1945.

End of the War with Japan

Island Warfare

In the Pacific Ocean, U.S. troops captured island after island from the Japanese. In February 1943, after six months of jungle warfare, U.S. forces drove the Japanese from Guadalcanal, one of the Solomon Islands. The United States captured Saipan in the Mariana Islands in July 1944. From Saipan, U.S. airplanes began bombing Japan.

In October 1944 soldiers led by U.S. general Douglas MacArthur landed in the Philippines. The United States captured the Philippine capital of Manila in March 1945.

U.S. forces landed on Iwo Jima in February 1945 and on Okinawa in April 1945. Both these islands belonged to Japan. During the fight for Okinawa, Japanese pilots made kamikaze attacks—they crashed their airplanes into U.S. ships on purpose. Eventually, though, U.S. forces captured both islands.

Hiroshima and Nagasaki

By 1945 scientists in the United States had invented the atomic bomb, a new weapon of immense power. On August 6, 1945, a U.S. airplane dropped an atomic bomb on Hiroshima, Japan. More than 70,000 people died from the explosion and fires. On August 9

another U.S. plane dropped an atomic bomb on the city of Nagasaki. Japan surrendered on September 2, 1945. This ended the war.

Results of the War

After the war's end, the Allies divided Germany among themselves. The Allies also punished Nazi leaders after putting them on trial in Nuremberg, Germany. They punished Japan's wartime prime minister, Tojo Hideki, as well.

After the war the United States and the Soviet Union were the most powerful countries in the world. Despite having been Allies, the two countries soon began a long struggle called the Cold War.

► More to explore

Bomb • Churchill, Winston • Cold War • De Gaulle, Charles • Fascism • France • Germany • Hitler, Adolf • Holocaust • Italy • Japan • Nazi Party • Nuremberg Trials • Roosevelt, Franklin D. • Stalin, Joseph • Union of Soviet Socialist Republics • United Kingdom • United States

Worm

Worms are soft, long-bodied invertebrates, or animals without a backbone. There are at least 20,000 species, or kinds, of worm. They are not all related. In fact, they belong to several different animal groups. Some well-known groups of worms are flatworms, roundworms, and segmented worms.

Worms are found almost all over the world. Some worms live in water. Other

worms live in the ground and help to improve the soil. Many worms, including some roundworms, are parasites. Parasites live inside other plants and animals and can cause harm.

Worms vary in size. Some are so small that they are invisible to the naked eye. Others are more than 100 feet (30 meters) long.

Worms usually have a tubelike, flattened, or leaflike body shape. Earthworms and other segmented worms have a body divided into segments, or rings. Worms usually lack legs or other limbs. Some types have bristles that help them to move.

Many worms have sense organs that can detect changes in their environment. A few have light-sensing organs.

Different worms reproduce in different ways. In some types of worm, males and females mate. Other worms can reproduce on their own because they have



The soft body of an earthworm is divided into segments, or rings.

both male and female reproductive parts. Some worms can develop new bodies from parts of their own body.

► **More to explore**

Animal • Parasite

Wotan

► see Odin.

Wounded Knee

Wounded Knee is a small town that is important in Native American history. Two conflicts between Native Americans and U.S. officials took place there, one in 1890 and the other in 1973. Wounded Knee is located on the Pine Ridge Indian Reservation in South Dakota. An Indian reservation is a piece of land that the U.S. government has set aside for Native Americans. The Pine Ridge Reservation is home to the Lakota Sioux people.



American Indian Movement members meet with a U.S. Department of Justice worker (right) during the Wounded Knee protest of 1973.

1890

During the 1800s white settlers and gold miners took away much Sioux land. They also killed many bison (buffalo), which the Sioux depended on for food. But a religious leader named Wovoka gave the Sioux new hope. He told them that a ceremony called the Ghost Dance would drive away the whites and bring back the bison. The U.S. government sent troops to stop the Ghost Dance. Government police killed Sitting Bull, a Sioux chief, while trying to arrest him.

A few hundred Sioux then left their homes. U.S. troops followed them. The Sioux surrendered and camped near Wounded Knee Creek. On December 29, 1890, while the soldiers were taking away the weapons of the Native Americans, a shot went off. Then the soldiers fired their machine guns at the Sioux. More than 200 Sioux were killed, including many women and children.

1973

More than 80 years later, on February 27, 1973, Wounded Knee was the site of another dispute. About 200 members of a group called the American Indian Movement took control of Wounded Knee by force. They felt that Native Americans were not being treated well, and they wanted the government to help. They refused to leave.

The protest lasted 70 days. Government workers shot and killed two Native Americans during that time. The Native Americans left Wounded Knee only after

the government agreed to hear their complaints.

► More to explore

Native Americans • Sioux • Sitting Bull

Wrestling

In the sport of wrestling, two opponents try to throw each other to the ground. Wrestlers need skill, physical strength and quickness, and good conditioning. Wrestling is one of the world's oldest sports. The ancient Egyptians wrestled. In ancient Greece wrestling was an important part of the Olympic Games. Wrestling probably developed into a sport from hand-to-hand combat in wartime.

Wrestling Styles

Professional wrestling in the United States is a mixture of sport and entertainment. Professional wrestlers use spectacular and dangerous moves that they must practice together in order to avoid injury.

Other countries have their own styles of wrestling. In Japan, for example, sumo wrestling is very popular. Sumo wrestlers wear loincloths and grip each other by the belt. Sambo is a wrestling style that started in the Soviet Union in the 1930s. It includes moves from the Japanese martial art called judo.

Two styles of wrestling are included in the modern Olympic Games: Greco-Roman and freestyle. A version of freestyle wrestling is a sport at high schools and colleges in the United States. Greco-



Sumo is a wrestling style that is popular in Japan. A sumo wrestler tries to push his opponent out of the ring or to force him to the floor.

Roman wrestling is more popular in Europe. The rest of this article has to do with Greco-Roman and freestyle wrestling.

Wrestling Mats and Equipment

Wrestling matches take place on padded mats. The mats vary in size and layout depending on the level of the competition. For example, an Olympic wrestling mat is similar but not quite the same as a mat used at a high school.

Wrestlers wear tights that cover the thighs, waist, and midsection. Special shoes help wrestlers to grip the mat. Wrestlers sometimes wear kneepads and headgear to protect the ears.

A Wrestling Match

Contests of freestyle and Greco-Roman wrestling are similar. Wrestlers in each style try to throw or press the opponent onto his back. The goal is to have both of the opponent's shoulder blades touch

the mat at the same time. This is called a fall, or a pin.

A match starts when two wrestlers meet at the center of the mat. Both wrestlers are standing as the match begins. They then try to grab and control the opponent by using various moves, which are called holds. In the Greco-Roman style, wrestlers can use holds only above the waist. They cannot trip or wrap the legs around an opponent. Freestyle wrestling allows almost all types of leg and arm holds. Freestyle wrestlers use their legs to trip, wrap, or hold the opponent. The rules usually forbid only actions that may injure an opponent, such as strangling, kicking, and punching.

A referee stands on the mat with the wrestlers. The referee awards points for successful moves. The referee also declares when a fall takes place. In international freestyle and Greco-Roman wrestling, a fall occurs when one wrestler forces the other's shoulder blades to the mat for just an instant. In



Wrestlers from different regions of China compete in a national tournament. Wrestling is popular all over the world.

school wrestling programs in the United States, the opponent's shoulder blades must stay pinned to the mat for at least a second.

A fall results in an immediate victory. Sometimes a fall does not happen before the match ends. Then the wrestler with more points wins.

History

Wrestling existed in Babylonia and Egypt as early as 3000 BC. The people of ancient India and China also wrestled. Wrestling was a major sport in ancient Greece. Milon of Croton was a famous Greek wrestler who lived in the 500s BC. He won the wrestling championship of the Olympic Games six times.

Starting in the 1700s wrestling matches took place at fairs and circuses. Outstanding wrestlers competed against anyone who wanted to challenge them. Wrestling was popular in the United States during the frontier period. Frontier wrestling was a rough sport. Any hold except strangling was allowed. A match lasted until someone gave up.

Greco-Roman and freestyle wrestling developed in the second half of the 1800s. In 1896 Greco-Roman wrestling was a part of the first modern Olympic Games. Freestyle wrestling was introduced at the 1904 Olympic Games. Women's freestyle wrestling became an Olympic event in 2004.

► More to explore

Martial Art • Olympic Games

Wright, Frank Lloyd



Frank Lloyd Wright designed a house called Fallingwater to blend into the hillside around it. He even left room for a stream to run under the house.

Frank Lloyd Wright was a U.S. architect who designed many houses and public buildings. Wright had a great influence on the architecture of the 1900s.

Wright was born on June 8, 1867, in Richland Center, Wisconsin. He studied engineering at the University of Wisconsin. In 1887 Wright moved to Chicago, Illinois. In 1893 he opened his own architectural office.

Wright became the leader of a type of architecture called the Prairie style. A house in this style is low-lying and blends into its surroundings. Wright also designed public buildings. One of his most famous buildings is the Guggenheim Museum in New York City. This building has a long spiral ramp instead of separate floors.

Wright died on April 9, 1959, in Phoenix, Arizona. Many of his buildings are open to the public.

► More to explore

Architecture

Wright, Wilbur and Orville

Two U.S. inventors named Wilbur and Orville Wright designed, built, and flew the first airplane, in 1903. Some features of their design are still used in airplanes today.

Wilbur Wright was born on April 16, 1867, near Millville, Indiana. Orville Wright was born on August 19, 1871, in Dayton, Ohio. Their father was a Christian minister.

Early Experiments with Flight

As young men the Wrights made and repaired bicycles. In 1896 they became interested in gliders. A glider is an aircraft with fixed wings (wings that do not flap)



Orville and Wilbur Wright

Did You Know?

The Wright brothers' first airplane, the flyer, had wings that were made of wood and muslin cloth.

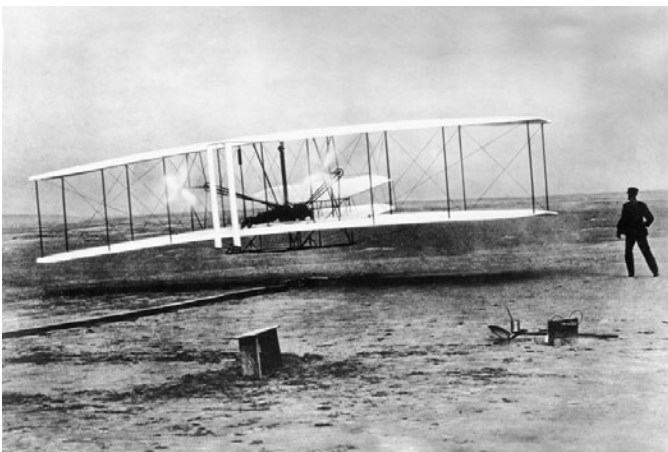
and no power supply. The flow of wind past the wings keeps a glider in the air.

In 1900 the Wrights started testing gliders near the town of Kitty Hawk, North Carolina. The sand dunes there were useful for their flight experiments. The windy hills made it easier to take off. The sand made it safer to land. There the Wrights tried different kinds of wings and control systems.

Building an Airplane

After studying gliders, the Wrights decided to design and build an airplane. An airplane is like a glider but has its own power supply. In 1903 the Wrights built an airplane with a gasoline engine. The engine powered two propellers.

The Wrights tested their plane in Kill Devil Hills, near Kitty Hawk. On December 17, 1903, Orville made the first flight in the airplane. He flew 120 feet (37 meters) in 12 seconds. Later that day Wilbur flew 852 feet (260 meters) in 59 seconds.



Orville Wright makes the first successful controlled airplane flight in history, on December 17, 1903. The flight took place in Kill Devil Hills, North Carolina.

The Wrights continued to make improvements. By 1905 they could stay in the air for about 40 minutes.

In Business

In 1908 the Wrights sold an airplane to the U.S. Army. Then they began demonstrating airplanes in the United States and Europe. They soon became famous.

In 1909 the Wrights formed the Wright Company. The company built airplanes in Dayton. It had its own flying field and flight school. In 1910 the brothers also started the Wright Exhibition Company. This company hired airplane pilots to perform stunts in front of audiences. They closed the company in 1911, after several employees had died in crashes.

Later Years

Wilbur died of a disease on May 30, 1912, in Dayton. After Wilbur's death, Orville ran the Wright Company until he sold it in 1915. He continued to work as an inventor. On January 30, 1948, Orville died of a heart attack in Dayton.

► More to explore

Airplane • Glider • Technology and Invention

Writing

Writing is a way of showing speech, or spoken language, with marks. People can make these marks on stone, paper, or a computer screen. People use writing to communicate with others.

Reading is the process of looking at and understanding writing. When people know how to read and write, they are called literate.

Types of Writing

The simplest type of writing uses pictures to stand for words or ideas. Many Native American groups used this type of writing. In other types of writing, marks of various designs can stand for whole words or parts of words. Chinese and Japanese characters are examples of this kind of writing. In alphabetic writing, marks called letters each stand for a different sound. The alphabet used for English is an example of this type of writing.

History

In prehistoric times people scratched marks on stones or wood. Some made cave paintings that showed people and animals. But these marks and drawings were not true writing systems.

As people began to trade, they developed systems for keeping records of their business. They created counting tokens to show how many animals or crops they had traded. Eventually different marks came to stand for the different goods. For example, a mark representing a cow looked much like a cow.

An important advance in writing took place when people began using marks to stand for more than just objects. Certain marks could then represent ideas, such as love or morning. At some point people started using marks to stand for the sounds of speech.



A clay tablet has a record of the sheep and goats that someone owned in ancient Mesopotamia (in modern Iraq). The writing system used on the tablet is called cuneiform.

The Sumerians of Mesopotamia (in modern Iraq) invented the first real writing system about 5,000 years ago. This writing, called cuneiform, was a system of wedge-shaped dents pressed into slabs of mud or clay. Not much later the Egyptians invented their own writing system, called hieroglyphics. About 3,000 years ago Semitic peoples in the Middle East created the first alphabets.

Most of the people who lived in early civilizations did not know how to read or write. In many places people called scribes wrote things down for others. By the AD 1400s, however, more people were becoming educated. The invention of the printing press in the middle of the 1400s helped make books and other writings widely available. By the 1900s many countries were requiring their



A girl practices writing letters on a blackboard.

children to go to school to learn how to read and write. Today most people in the world have these skills.

► More to explore

Alphabet • Communication
• Hieroglyphics • Language

Wyandot

The Wyandot are Native Americans of the central United States and southern Canada. They call themselves the Wen-



A museum in Ontario, Canada, shows what a Wyandot village may have looked like. In one building dried tobacco hangs from the ceiling.

dat. When French explorers met them in the early 1600s, they lived in what is now southern Ontario. The French called them the Huron. The Wyandot are still sometimes known by that name.

The Wyandot traditionally lived in longhouses, which were large enough to house several families. They built their longhouses using wood and bark. They grew corn, beans, squash, and sunflowers. They also fished and hunted deer. After the French arrived, the Wyandot traded furs to them for goods such as metal tools, cloth, and guns.

In the middle of the 1600s the Wyandot were attacked by their enemies, the Iroquois. The Iroquois destroyed Wyandot villages and took some Wyandot as captives. Other Wyandot escaped to the west. Still others went to live with the French in Quebec.

During the 1600s and 1700s the Wyandot who had moved west moved again. For a time they lived in what are now Michigan, Wisconsin, Illinois, and Ohio. In the middle of the 1800s the U.S. government forced these Wyandot to move to Indian Territory (now Oklahoma).

At the end of the 20th century about 2,000 Wyandot lived in the United States, mostly in Oklahoma or Kansas. Other Wyandot lived in Canada, in Ontario and Quebec. There they are known as the Huron-Wendat.

► More to explore

Iroquois • Native Americans

Wyoming



The Snake River and the Teton Range are attractions of Wyoming's Grand Teton National Park.

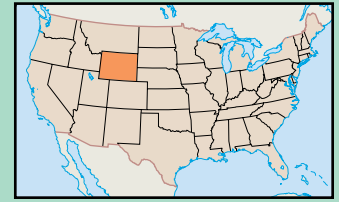
The state of Wyoming lies in the western United States. An explorer once described Wyoming as a land where “nature had collected all of her beauties together in one chosen place.” Wyoming's natural beauty is preserved in several national parks and monuments. One of them, Yellowstone National Park, became the world's first national park in 1872.

Wyoming's nickname is the Equality State. In 1869 Wyoming allowed women to vote and to hold public office. This was the first time in U.S. history that women had been given these rights. Wyoming also elected the country's first female governor, Nellie Tayloe Ross, in 1924. The state capital is Cheyenne.

Geography

Wyoming borders Montana on the north and northwest. To the west is

Idaho. Utah lies to the southwest, and Colorado lies to the south. Wyoming's eastern neighbors are Nebraska and South Dakota.



Wyoming is a state of high mountains and vast plains. The Rocky Mountains cover the western two thirds of the state. The Rockies are made up of several ranges separated by wide valleys and basins. The flat grasslands of the Great Plains cover eastern Wyoming. The climate is dry, with cold winters and warm summers.

People

Wyoming has the smallest population of all the 50 states. Non-Hispanic whites make up almost 90 percent of the population. About 6 percent of the people are Hispanic. Native Americans make up more than 2 percent of the population.



Facts About WYOMING

Flag



Population

(2000 census)
493,782—rank,
50th state; (2008
estimate)
532,668—rank,
50th state

Capital

Cheyenne

Area

97,814 sq mi
(253,336 sq
km)—rank, 10th
state

Statehood

July 10, 1890

Motto

Equal Rights

State bird

Meadowlark



State flower

Indian paintbrush



Wyoming's African American and Asian populations are very small.

Economy

Mining is Wyoming's most important industry. The state produces a lot of coal, natural gas, and oil. Other mining products include the clay called bentonite and the mineral trona, which is used to make soap and glass.

Almost all the agricultural land in Wyoming is used for ranching. Cattle and sheep are the most valuable livestock. The main crops include wheat, oats, barley, hay, corn, sugar beets, beans, and potatoes.

Tourism is also important to Wyoming's economy. Millions of people visit the state each year to enjoy its national parks, including Yellowstone and Grand Teton National Park. Popular tourist activities include camping, fishing, hunting, and hiking, as well as skiing and other winter sports. Wyoming's cowboy culture is another tourist attraction. The world's largest rodeo is held each summer in Cheyenne during a festival called Frontier Days.

History

The Shoshone, the Arapaho, and other tribes lived in the Wyoming area when white explorers arrived in the 1700s. The United States bought most of the region from France in the Louisiana Purchase of 1803. In about 1807 John Colter, a member of the Lewis and Clark Expedition, explored the Yellowstone Park area. Fort William (later called Fort Laramie) was built in the

southeast in 1834. It was the first lasting settlement in what is now Wyoming.

The cross-country railroad reached Cheyenne in 1867. The railroad encouraged settlers to come to Wyoming. A year later the U.S. Congress created the Wyoming Territory. White settlement was limited to southern Wyoming until 1876, when the local Native Americans were defeated. Wyoming became a state in 1890.

Ranching developed into Wyoming's main industry in the late 1800s. For a while the availability of vast ranches and farmland drew people to Wyoming. During the 1900s mining replaced ranching as the most important part of the economy. In the 1980s the oil industry suffered, and many people lost their jobs. Wyoming's population fell as people left the state to look for work. But between 1990 and 2000 the state's population again began to grow.

► More to explore

Cheyenne • Rocky Mountains



Two cowboys appear in a rodeo in Cody, Wyoming.



X-rays are powerful waves of energy that can travel through substances that light cannot.
(See X-rays.)

X-rays

X-rays are powerful waves of energy. Like light, X-rays are a form of radiation. They are very useful because they can go through substances that light cannot. X-rays can show images, or pictures, of the inside of an object, such as a suitcase or the human body.

How X-rays Work

An X-ray machine makes X-rays and directs them toward an object. The X-rays pass through some parts of the object but are blocked by other parts. For example, X-rays directed at a body pass through the skin and soft tissues, such as muscle. But hard body parts, such as bones, block the X-rays. Special film behind the body captures the image made by the X-rays. When the film is developed, the hard parts appear white on the film. The soft parts appear black.

Medical Uses

X-rays are an important tool in medicine and dentistry. Doctors use X-rays to



In a "positive" X-ray image the black and white areas are reversed, so bones look dark.



Security workers at airports use X-ray machines to check for dangerous items in passengers' bags.

find diseases such as cancer and to study broken bones. Dentists use them to spot cavities in teeth.

X-rays can damage or destroy the body's cells. To protect the patient, the parts of the body that are outside the area being examined are shielded from the X-rays. But the damaging effects of X-rays can be useful, too. Doctors sometimes use X-rays to kill cancerous growths.

Other Uses

X-rays also have many uses outside of medicine. Scientists use X-rays to study the structure of many things, both living and nonliving. Special X-ray telescopes pick up X-rays given off by objects in outer space, such as distant stars. Manufacturers use X-rays to find hidden flaws in products. At airports, security equipment uses X-rays to look for hidden weapons in the baggage of travelers.

► More to explore

Dentistry • Medicine • Radiation
• Telescope



Yaks carry and pull heavy loads for people. People also keep yaks for their meat and milk.

(See Yak.)

The Yangtze is the longest river in all of Asia.

(See Yangtze River.)

The leaves and seeds of yew trees are very poisonous.

(See Yew.)

The word yoga comes from an ancient Sanskrit word that means "union."

(See Yoga.)

Seven countries in southeastern Europe used to make up one country called Yugoslavia.

(See Yugoslavia.)

Thousands of people came to the Yukon in Canada after gold was discovered there in 1896.

(See Yukon Territory.)

Yak

The yak is a large, shaggy ox with humped shoulders. It lives on high land, mostly in the part of China called Tibet. For centuries the people of Tibet have tamed yaks to use as work animals and as a source of food. The yak is related to cattle, buffalo, and bison. Its scientific name is *Bos grunniens*.

The yak lives in cold places with few plants. Sometimes it has to roam a long way to find enough grass to eat. Its long hair helps it stay warm. The yak also needs a lot of water. In winter it often eats snow.

Some yaks live in the wild, but they are very rare. Wild yaks have blackish brown hair and large horns. Wild males may weigh up to 2,200 pounds (1,000 kilograms). Females are smaller. Wild yaks live in herds made up of females and young animals. Adult males live alone or in smaller groups.

Domestic, or tamed, yaks are much smaller than wild yaks. They can be red, brown, black, or black and white. They



A boy in Nepal leads a domesticated, or tamed, yak.

have smaller horns than wild yaks. Some domestic yaks have no horns.

People use domestic yaks for carrying and pulling heavy loads. Yaks are also kept for their meat and milk. The hair is used to make rope and cloth. The skin is used for caps, coats, and blankets.

► More to explore

Cattle

Yakama

The Yakama are Native Americans of the U.S. state of Washington. They have a large reservation on the land where they have lived for thousands of years. The nearby city of Yakima was named after the tribe. The tribe's name is sometimes spelled Yakima.

The Yakama moved with the seasons. In winter they lived in homes called lodges. They built their lodges by covering a wooden frame with mats woven from leaves. In spring the Yakama camped in places where they could gather wild plants to eat. In summer they moved to the Columbia River area to fish for salmon. In autumn they hunted and gathered berries in the Cascade Mountains. In the early 1700s the Yakama got horses from other tribes. On horseback they traveled east onto the Great Plains to hunt bison (buffalo).

In 1805 the U.S. explorers Meriwether Lewis and William Clark passed through Yakama lands. Fur traders and Christian missionaries came next. The U.S. government wanted to open the tribe's



A Yakama tepee is covered with mats woven from reeds. It was made in the early 1900s.

land to white settlers. From 1855 to 1858 the Yakama fought a war against U.S. troops. The Yakama lost and were forced to move to a reservation. At the end of the 20th century there were more than 8,000 Yakama living in the United States.

► More to explore

Lewis and Clark Expedition • Native Americans

Yamoussoukro



Population
(2003 estimate)
185,600

Yamoussoukro is the capital of Côte d'Ivoire, a country in western Africa. It

became the official capital in the late 20th century. However, many government offices remained in Abidjan, the country's first capital and largest city.

One of the world's largest Christian churches is in Yamoussoukro. It is a type of Roman Catholic church called a basilica. It can hold 18,000 people.

Until the 1960s Yamoussoukro was a small village. In 1960 Côte d'Ivoire became an independent country with Abidjan as its capital. However, Yamoussoukro was the hometown of the country's first president, Félix Houphouët-Boigny. He spent large amounts of his family's money to make Yamoussoukro more modern. The city grew and became more important. In 1983 it became the official capital of Côte d'Ivoire.

► More to explore

Abidjan • Côte d'Ivoire



A woman carries coconuts past the Yamoussoukro Basilica, a church in Côte d'Ivoire's capital. It is one of the largest Roman Catholic churches in the world.

Yangon



Population
(2005 estimate)
4,107,000

Yangon is the largest city and main port of Myanmar, a country in Southeast Asia. The city lies on the Yangon River. It is Myanmar's center of industry. Yangon was the country's capital until 2006.

The most famous site in Yangon is a group of ancient Buddhist temple buildings called the Shwedagon Pagoda. The city began as a settlement around this Buddhist site. The king of Myanmar developed the city as a port in the 1750s. After that Yangon grew.



The Sule Pagoda is one of the important Buddhist temple buildings in Yangon, Myanmar. Modern buildings surround the pagoda.

Great Britain captured Yangon in 1852. The British called the city Rangoon and the country Burma. In the 1880s the British took control of all of Burma. They made Rangoon the capital.

In 1948 Burma became an independent country. Rangoon remained its capital. In 1989 the country's government requested that people call the city Yangon and the country Myanmar. In 2006 the government moved the capital north to Naypyidaw, a site near the town of Pyinmana.

► More to explore

Myanmar

Yangtze River

The Yangtze is the longest river in China and in all of Asia. It is also the third longest river in the world, after the Nile (in Africa) and the Amazon (in South America). It is 3,915 miles (6,300 kilometers) long.

The Yangtze, which is also called the Chang Jiang, begins in the mountains of Tibet, a region of western China. It runs through mountains for most of its length. Near the end of its course it flows through wide, low plains. More than 700 streams and rivers flow into the Yangtze. The most important of these are the Yalong, Min, Jialing, Han, and Wu rivers. The Yangtze empties into the East China Sea near Shanghai in east-central China.

People have lived in the area around the Yangtze River for thousands of years.



Many people live on the plains of the lower Yangtze, where the soil is rich and good for farming. Nearly half of China's crops are grown in this area. They include rice, cotton, wheat, barley, corn, beans, and hemp. Many other people make a living by fishing in the Yangtze. Carp, bream, Chinese perch, lamprey, flatfish, and sturgeon are among the catch.

The Yangtze has been an important traffic route since the 1200s. The river connects inland and coastal ports with major cities, including Nanjing, Wuhan, and Chongqing. China's Grand Canal joins the Yangtze to other river routes.

Dams on the Yangtze help to control flooding. They also produce electric power. In addition, they allow large ships to travel farther inland on the river.

In 1994 workers began building the huge Three Gorges Dam across the Yangtze. People in hundreds of towns in the river valley left their homes to make way for the project. Workers finished the main part of the construction in 2006.

► More to explore

China • Dam • River

Yaoundé



Population
(2004 estimate)
1,434,700

Yaoundé is the capital of Cameroon, a country in west-central Africa. The city lies on hilly land between the Nyong and Sanaga rivers.

Several research institutes and schools of higher learning are located in Yaoundé. The city is a center of transportation, trade, banking, communications, and other service industries. Factories in Yaoundé produce lumber, cigarettes, processed foods, and other products.

Yaoundé was founded in 1888, when Germany ruled the Cameroon region. In



The Yangtze River makes a wide bend as it flows through southwestern China.



The interesting design of some of Yaoundé's public buildings makes them stand out from the other buildings in the city.

the early 1920s France took control of most of Cameroon. From then on Yaoundé served as the capital of the French colony, except for a period in the 1940s. In 1960 Cameroon became an independent country with Yaoundé as its capital.

► More to explore

Cameroon

Yaqui

The Yaqui are a group of Native Americans who originally lived in northwestern Mexico. Today the tribe is still centered there, in the state of Sonora. Many Yaqui also live in the United States, in the state of Arizona.

The Yaqui traditionally built dome-shaped, wooden homes. They covered their homes with mats made of plant material. They grew corn, beans, and squash. They also hunted, fished, and gathered wild plants.

Spanish explorers arrived in Yaqui territory in 1533. Over the next several hundred years the Yaqui fought the Spanish, and later the Mexicans, for control of their land. In the 1880s the Mexican government took over the tribe's territory. The government sent thousands of Yaqui to southern Mexico, far from their homeland. Some Yaqui escaped and returned home. Others fled Mexico for the United States. They made new settlements in what is now southern Arizona.

In the 1930s the Mexican government returned much of the Yaqui's original territory to the tribe. Many Yaqui then moved back to Sonora. At the end of the 20th century there were more than 25,000 Yaqui in Mexico. Another 15,000 Yaqui lived in the United States. The tribe has a reservation near Tucson,



A photograph from about 1907 shows a Yaqui girl.

Arizona. The group living on the reservation is known as the Pascua Yaqui Tribe of Arizona.

► More to explore

Native Americans

Yeltsin, Boris

Boris Yeltsin led Russia through its last days as a part of the Union of Soviet Socialist Republics, or Soviet Union. From 1991 through 1999 Yeltsin served as president of the independent country of Russia.

Boris Nikolayevich Yeltsin was born in Sverdlovsk (now Yekaterinburg), Russia, on February 1, 1931. He became an engineer as a young man.

In the 1960s Yeltsin joined the Communist Party—the political group that controlled the Soviet Union. In 1976 the party put him in charge of the Sverdlovsk region.

In 1985 Mikhail Gorbachev became the leader of the Soviet Union. Gorbachev made Yeltsin the leader of Moscow, the capital city. Yeltsin lost this job in 1987 because he pushed too hard for change.

In 1989 other Russians who wanted change elected Yeltsin to a seat in a new Soviet legislature. In 1990 he was elected president of the Russian republic. At the time, Russia was one of the 15 republics that made up the Soviet Union. Soon after that, Yeltsin left the Communist Party.



Boris Yeltsin led Russia during its last year as a part of the Soviet Union.

In August 1991 Yeltsin helped to stop a group of Communists from taking power away from Gorbachev. By this time, however, many of the Soviet republics wanted complete independence. In December 1991 Gorbachev resigned and the Soviet Union ceased to exist. The republics each became independent countries.

Yeltsin remained president of Russia. He tried to introduce changes in the economy, but some members of the legislature disagreed with him. Yeltsin won reelection in 1996. But by 1999 he had angered many legislators. They tried to remove him from office but did not succeed. Yeltsin retired on December 31, 1999. He died on April 23, 2007, in Moscow.

► More to explore

Communism • Russia • Union of Soviet Socialist Republics



Yemen

Yemen is a country in the Middle East. From 1962 to 1990 Yemen was divided into two separate countries: North Yemen and South Yemen. Yemen's capital is Sanaa.

Geography

Yemen is on the southern tip of the Arabian Peninsula, a triangle of land in southwestern Asia. Yemen shares borders with Saudi Arabia and Oman. The Red Sea lies to the west, and the Gulf of Aden is to the south. The Gulf of Aden links the Red Sea with the Arabian Sea. The Arabian Sea lies to the southeast of Yemen. Several nearby islands belong to Yemen.

A narrow, sandy plain runs along Yemen's coasts. Mountains and other highlands rise in central Yemen. North of the highlands is a large, sandy desert. The desert and the coasts are hot and



A wall surrounds the oldest part of Sanaa, Yemen. The Liberty Gate is the most famous of the wall's many gates.

dry. The highlands have cooler temperatures and enough rainfall for farming.

Plants and Animals

Eucalyptus, sycamore, and fig trees grow in the highlands. Thorny shrubs grow in the dry areas. Date palm trees grow near the coasts.

Yemen's wildlife includes baboons, hyenas, foxes, and rabbits. Hawks, vultures, ravens, and other birds also live in the country.

People

Most of the people in Yemen are Arabs. Small groups of Somalis, other Africans, and South Asians also live in Yemen. Most people speak the Arabic language. Some people, especially in the cities, speak English as well. Nearly all the



people follow the religion of Islam. However, there are small groups of Hindus, Christians, and Jews.

The largest city is the capital, Sanaa. Sanaa is known for its ancient architecture, markets, and mosques (Muslim houses of worship). The country's second-largest city is Aden, the former capital of South Yemen. Aden has long been an important seaport. Although these cities are large, most Yemenis live in villages and small towns. A small part of the population is nomadic. This means that they travel from place to place.

Economy

Yemen's economy depends on the production of petroleum (oil). However, Yemen does not have as much oil as other countries in the Middle East. Yemen also produces metal products, cloth, and cement.

About half of Yemen's workers are farmers or herders. The main food crops are sorghum, tomatoes, potatoes, grapes, oranges, and wheat. Other crops include coffee and *qat*. Many Yemenis chew the leaves of the *qat* plant. Herders raise sheep, goats, and cattle. Fishing is another source of food.

History

In ancient times wealthy kingdoms ruled what is now Yemen. The kingdoms grew rich from trading frankincense and myrrh, which came from trees grown in the region. Many ancient peoples used frankincense and myrrh to make perfumes and medicines.

In the 600s the people of Yemen accepted Islam. Muslim leaders called imams then ruled Yemen. In the 1500s the Ottoman Empire took control of parts of Yemen. The Yemenis drove out the Ottoman Turks in the 1600s. The Turks returned in the mid-1800s and took over northern Yemen. Meanwhile the British began taking control of southern Yemen.

Two Yemens

The Ottoman Empire collapsed in 1918. Imams then ruled northern Yemen until 1962, when the last imam lost power. Northern Yemen became a new country called the Yemen Arab Republic, or North Yemen.

In 1967 the British left southern Yemen, and a socialist group took control of the area. (In socialism the government controls all businesses and property.) Another socialist government that took power in 1969 renamed the country the People's Democratic Republic of Yemen, or South Yemen.

Unification

In 1990 the two Yemens joined together as the Republic of Yemen. In 1994 southern rebels began a civil war against the government. Less than two months later the government defeated the rebels. In 2000 Yemen signed an agreement with Saudi Arabia concerning their common border, which had long been disputed.

► More to explore

Arabs • Middle East • Sanaa

Facts About YEMEN



Population
(2008 estimate)
23,013,000

Area
214,300 sq mi
(555,000 sq km)

Capital
Sanaa

Form of government
Republic

Major cities
Sanaa, Aden,
Ta'izz,
Al-Hudaydah,
Al-Mukalla

Yerevan



Population
(2006 estimate)
1,103,800

Yerevan is the capital of Armenia, a country in western Asia. It is Armenia's largest city by far. It is also one of the oldest cities in the world. Yerevan lies on the Hrazdan River. The peaks of Mount Ararat and other mountains rise nearby.

Yerevan is Armenia's center of industry. The city is noted for its chemical factories. Other factories in Yerevan process foods and metals and make jewelry, clothing, machinery, and cars.

People have lived in Yerevan for several thousand years. It became part of Armenia more than 2,500 years ago. The city



Yerevan, Armenia, is a city of broad boulevards. The round building at left is an opera house.

lay on an important trade route in ancient times. For this reason many groups tried to capture Yerevan. Over its long history the Romans, Arabs, Turks, Persians, and other groups ruled the city.

Russia and later the Soviet Union controlled Yerevan for much of the 1800s and 1900s. In 1991 Armenia became an independent country with Yerevan as its capital.

► More to explore

Armenia

Yew

Yews are evergreen trees and bushes that grow in the northern half of the world. There are several species, or types, of yew. They include the English yew and the western yew.

Some yew trees may reach 80 feet (25 meters) or more in height. Yews have many branches with narrow, sharply pointed leaves. The leaves are dark green above and lighter underneath. Each yew seed is surrounded by a red cup that looks like an open berry. Yew leaves and seeds are very poisonous. People and animals can get sick or die after eating them.

Yews grow very slowly but live very long. Some yews are thought to be more than 1,200 years old. Yews usually are not bothered by insects.

People trim some kinds of yew to use in landscaping. Yews are also important



The red growths on a yew branch look like open berries. Each of them holds one of the plant's seeds.

because their wood is hard. It is often used in woodcarving.

► More to explore

Tree

Yoga

Yoga is a system of training for the body and the mind. The word yoga means “union” in the ancient Sanskrit language of India. People who follow the religion of Hinduism practice yoga to feel united with a higher power. They seek this union through posture (body position), breathing, and meditation (mental exercises). The most popular form of yoga is called hatha yoga.

Today many people who do not follow Hinduism practice yoga for exercise and

relaxation. The movements and positions used in yoga are gentler than many forms of exercise. As a result, people of many different ages and fitness levels can take part.

The practice of yoga involves learning a variety of postures. These body positions are known as asanas. One well-known asana is called the lotus position. In the lotus position, a person sits with his or her legs crossed. The legs are crossed tightly so that the foot of each leg can rest on the opposite thigh. Another common asana is the downward-facing dog. In this position, the hands and feet are flat on the floor, and the hips are raised toward the ceiling. People skilled at yoga can hold asanas for a long time.

Yoga also features different breathing exercises. Deep breathing helps to deliver oxygen to the blood. It also helps people to relax. While a person focuses on breathing, the mind becomes clearer.

► More to explore

Exercise • Hinduism



People learn yoga exercises in a class.

Yom Kippur



A man blows a traditional trumpet called a shofar on the Jewish holiday of Yom Kippur.

Yom Kippur is the holiest day in Judaism. It is a day marked by prayer and fasting. Yom Kippur is observed on the 10th day of the Jewish calendar month Tishri. The holiday usually occurs in September or October.

In English, Yom Kippur is known as the Day of Atonement. The holiday's purpose is to purify the individual and community. On Yom Kippur Jews are forgiven for their sins against God. They also ask for forgiveness from people they have wronged. No work can be performed on this day. The day is generally spent in the synagogue, the Jewish house of worship.

Jews believe that on the 10th of Tishri, Moses came down from Mount Sinai with the second set of tablets of the Ten

Commandments. This event happened 40 days after the Israelites (the Jewish people) committed the sin of worshipping a golden calf instead of praying to God. Moses told the Israelites that they were forgiven. Since this time, the day was observed as Yom Kippur.

► More to explore

Judaism

Yucatán Peninsula

The Yucatán Peninsula is a region in Central America. The Gulf of Mexico lies on its western and northern sides. The Caribbean Sea lies on its eastern side. The northern part of the Yucatán is in Mexico. Belize and a part of Guatemala are in the south.

Mayan Indians make up a large part of the population. There are also many people with both Mayan and European ancestry. In Belize many people have African roots.

The Maya have lived on the Yucatán Peninsula for thousands of years. The ancient Maya built cities, such as Chichén Itzá, that featured pyramids



and other impressive structures. Today the ruins of these cities attract many tourists. Tourists also visit Cancún, a resort on the peninsula's coast.

► More to explore

Maya

Yugoslavia



Yugoslavia was a country that existed in southeastern Europe from 1929 to 2003. It was created when several former kingdoms and territories joined together. They became the six republics, or states, of the country of Yugoslavia. Each republic had its own mixture of ethnic groups and religions. Tensions sometimes flared up between the different groups.

In the late 20th and early 21st centuries the republics broke apart to become independent countries. These countries are Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia, and Slovenia.

Geography and People

Yugoslavia lay along the Adriatic Sea on the Balkan Peninsula of Europe. It shared borders with Italy, Austria, Hungary, Romania, Bulgaria, Greece, and Albania. Its capital was Belgrade, which is now the capital of Serbia.

Most of Yugoslavia's people were Slavs who spoke Slavic languages. The Slavs included several different ethnic groups. They were the Serbs, Montenegrins, Croats, Slovenes, Macedonians, and Bosnian Muslims (now called Bosniacs). These groups were related, but each group had its own separate history. Different groups also followed different religions. Many peoples who were not Slavs—including Albanians, Hungarians, and Turks—lived in Yugoslavia, too.

Did You Know?

The name Yugoslavia means "land of the South Slavs."

History

By the late 1800s the Ottoman Empire and Austria-Hungary ruled much of the Balkan region. Those two empires were defeated in World War I (1914–18). After the war several Balkan lands formed a new country. It was called the Kingdom of Serbs, Croats, and Slovenes. The kingdom changed its name to Yugoslavia in 1929.

Germany, Italy, and their allies invaded Yugoslavia in 1941, during World War II. A few years later, Josip Broz Tito led troops that freed Yugoslavia from the invaders. Tito became the country's leader. He set up a Communist government in Yugoslavia.

The country also gained a new form. It became a federation, or collection of six equal republics. Two sections of Serbia that wanted to be separate were also given some power. This angered the leaders of Serbia. But Tito was a strong leader. He helped hold the many different ethnic groups in all of the republics together in one unified country.

After Tito died in 1980 the country went through major changes. The new leaders were not able to hold the country together. Many neighboring Communist countries began to get rid of Communism during this period. Some of the Yugoslav republics wanted to do the same. They held elections and eventually declared themselves independent.

Serbia fought to keep the republics part of Yugoslavia. A bloody civil war raged until 1995.

After the war, Serbia and Montenegro were the only republics that remained part of Yugoslavia. In 2003 they formed a different country, named Serbia and Montenegro. In 2006 Montenegro and Serbia split peacefully into two separate countries. Two years later Serbia lost some of its territory when the province of Kosovo declared independence.

► More to explore

Balkan Peninsula • Bosnia and Herzegovina • Communism • Croatia • Kosovo • Macedonia • Montenegro • Serbia • Slovenia

Yukon River



The Yukon River flows through large areas of wilderness on its way to the Bering Sea.

The Yukon River flows through the Yukon territory in Canada and the U.S. state of Alaska. It is 1,980 miles (3,190 kilometers) long. The river flows in a northwestern direction starting in southern Yukon. In Alaska it turns toward the southwest. It empties into the Bering Sea.

Only plants and animals that can survive in a cold climate are found around the Yukon River. These include spruce and other evergreen trees in the mountain valleys and such animals as bears, caribou, moose, timber wolves, muskrats, weasels, and foxes.

Native Americans have lived along the river for thousands of years. European fur traders began to arrive in the 1800s. More outsiders came to the area after people discovered gold on the Klondike River in 1896. (The Klondike feeds into the Yukon in western Yukon.) However, most of the gold seekers did not stay. Today the population of the region is very small.

Yukon

Yukon is a territory of Canada located in the northwestern part of the country. The territory is a largely untouched wilderness with a very small population. The capital is Whitehorse.

Geography

Yukon borders Alaska (a U.S. state) on the west, British Columbia (a Canadian province) on the south, and the Northwest Territories (a Canadian territory) on the east. The Beaufort Sea (a part of the Arctic Ocean) lies to the north. Yukon is the ninth largest of Canada's 13 provinces and territories.

In Yukon, mountains surround a central plateau, or high, flat area. Mount Logan rises in the southwest. It is the highest



point in Canada. The Yukon River flows northwest through the territory. Yukon's climate is cool and dry. The land in the far north is tundra, a cold area with no trees.



People

About one fifth of the people of the territory are Native Americans. Most belong to groups in the Athapaskan language family. The rest of the people have European ancestors or mixed Native American and European roots. Most people speak English. Smaller groups speak French or various Native American languages.

Two thirds of the population lives in Yukon's capital and largest city, Whitehorse. Dawson and Watson Lake are the next-largest towns. Other communities in Yukon have populations of several hundred or less.

Economy

Mining is the most important industry in Yukon. The territory has one of the world's largest deposits of tungsten, a valuable metal. There are also deposits of lead, zinc, silver, and gold.

Tourism is important to the territory's economy, too. Most visitors come to see Yukon's wilderness. Many people hike, raft, or fish in Kluane National Park and other areas.



Yukon has unspoiled wilderness for campers to enjoy.

Fishing and the fur trade are other important activities. Fishers catch salmon, lake trout, whitefish, and other fishes. Trappers catch lynx, marten, Wolverines, foxes, muskrat, and beavers for their furs. Agriculture is only a small part of the economy.

History

The first people in the Yukon territory probably came from Asia between 60,000 and 10,000 years ago. Over time, these people's descendants developed the several Native American cultures of the area.

The area that is now Yukon was one of the last places in North America to be visited by non-native people. Explorers for a fur-trading group called the Hudson's Bay Company entered the region in about 1840. Great Britain had given this company the right to control trade in what is now western Canada. In 1870 the Hudson's Bay Company sold this land to the new country of Canada.

What is now Yukon then became a part of Canada's Northwest Territories.

In 1896 people discovered gold near the Klondike River, which feeds into the Yukon River. Thousands of people came to the Yukon area in the hope of getting rich. They built Dawson, which became the largest city in western Canada. However, the Klondike gold rush lasted only a few years.

Canada created the separate Yukon Territory in 1898. The Canadian government moved the capital from Dawson to Whitehorse in 1953. In 2003 the Yukon Territory's name was officially changed to Yukon.

► More to explore

Athapaskan • British Columbia
• Canada • Hudson's Bay Company
• Northwest Territories • Tundra



The town of Dawson sits on the banks of the Yukon River. Dawson was once the capital of the Yukon Territory.

Facts About YUKON

Flag



Population
(2006 census)
30,372

Area
186,272 sq mi
(482,443 sq km)

Capital
Whitehorse

Motto
none

When Yukon Became a Territory
1898



Zagreb is the capital of Croatia, a country in Europe.

(See Zagreb.)

Zebras communicate with each other using calls and facial expressions.

(See Zebra.)

Zeus was the most powerful god in ancient Greek mythology.

(See Zeus.)

The African country of Zimbabwe was once called Southern Rhodesia.

(See Zimbabwe.)

Some zoos help endangered species, or animals at risk of dying out in the wild, to have young.

(See Zoo.)

Zoroastrians believe the world is involved in a struggle between good and evil.

(See Zoroastrianism.)

Zagreb



Population
(2001 census)
691,724

Zagreb is the capital of Croatia, a country in southeastern Europe. It is Croatia's largest city and cultural center. The city lies on the Sava River.

Zagreb is the center of trade and industry in Croatia. Factories in the city make machinery, chemicals, food products, and cloth and clothing.

For several hundred years there were two towns where Zagreb is now. Together the two towns were the political and cultural center of Croatia. In the 1800s



The two spires of a cathedral in Zagreb, Croatia, have towered over the city for hundreds of years.

the towns were combined to form Zagreb.

In the early 1900s Zagreb and the rest of Croatia became part of the country of Yugoslavia. Croatia declared its independence in 1991. Fighting then broke out between different groups in Croatia. Zagreb was heavily damaged. It began to rebuild after the war ended in 1995.

► More to explore

Croatia • Yugoslavia

Zaharias, Babe Didrikson

Babe Didrikson Zaharias was one of the best athletes of the 1900s. She excelled in many sports.

Mildred Ella Didriksen was born on June 26, 1911, in the U.S. city of Port Arthur, Texas. She eventually gained the nickname of Babe. She also changed the spelling of her last name.

During 1930–32 Didrikson played on the women's All-America basketball team. At the 1932 Olympic Games she won two gold medals for track and field events. She won the U.S. Women's Open, an important golf championship, in 1948, 1950, and 1954.

Didrikson married George Zaharias in 1938. She died on September 27, 1956, in Galveston, Texas.

► More to explore

Golf • Track and Field

Zambia

The country of Zambia sits between eight other countries in southern Africa. Zambia's capital is Lusaka.

Zambia shares borders with the Democratic Republic of the Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia, and Angola. Most of the country is on a plateau, or raised area of land. Several river valleys cross the plateau.

Wooded areas and grasslands cover much of the plateau. Grasses grow around Zambia's swamps and lakes. National parks in Zambia protect elephants, lions, monkeys, zebras, giraffes, antelope, wolves, hyenas, and baboons.

Zambia has many different peoples, each with their own language. The Bemba and Tonga peoples form the largest groups. English is the language of government. About half of the people fol-



low Christianity. Many people also practice African religions.

The mining of copper and other metals is very important to Zambia's economy. Most Zambians work as farmers. Major crops include sugarcane, cassava, corn, and vegetables. Farmers also raise cattle, goats, pigs, and chickens.

The ancestors of modern Zambians came to the area beginning in the 1400s. European settlers arrived in the mid-1800s. The British settlers called the area Northern Rhodesia. The British government took control of Northern Rhodesia in 1924.

In 1964 Northern Rhodesia gained independence. It was renamed as the Republic of Zambia. Zambia's first president ruled for almost 30 years.

► More to explore

Lusaka



Facts About ZAMBIA



Population
(2008 estimate)
11,670,000

Area
290,585 sq mi
(752,612 sq km)

Capital
Lusaka

Form of government
Republic

Major cities
Lusaka, Ndola,
Kitwe, Kabwe,
Chingola



The Zambezi River plunges over a cliff, forming a wide waterfall called Victoria Falls. The river forms part of the border between Zambia and Zimbabwe.

Zapata, Emiliano



The Mexican revolutionary leader Emiliano Zapata was ready to use his rifle or his sword.

Emiliano Zapata was one of the leaders of the Mexican Revolution. He fought against rich landowners who had taken land away from peasants, or poor farmers. He wanted to return the land to the peasants.

Zapata was born on August 8, 1879, in Anenecuilco, Mexico. His parents were peasants. As a young man Zapata saw his neighbors lose their land to the owners of large farms. He led his neighbors in protests against the landowners. Officials punished him by making him serve in the army for six months. After leaving the army Zapata gathered a group of peasant fighters. They took land back from the landowners by force.

Zapata also opposed Porfirio Díaz, the president of Mexico. Díaz did nothing

to help the peasants. In 1910 Zapata and others started the Mexican Revolution. By 1911 they had forced Díaz from power. A leader named Francisco Madero took his place.

Even after Díaz was gone, Zapata did not think Mexico's leaders did enough for the peasants. A general named Victoriano Huerta took power from Madero in 1913. Zapata disliked Madero, but he refused to help Huerta. This weakened Huerta, who lost power in 1914. Venustiano Carranza was the next leader of Mexico. Zapata disliked Carranza also. For a short time in 1914, Zapata's army controlled Mexico City, the capital.

Then Zapata joined forces with Pancho Villa, another revolutionary leader. They worked together to hand out pieces of land to peasants. Meanwhile, the war against the government continued. Carranza's forces defeated Villa in 1917. They shot and killed Zapata on April 10, 1919, in Morelos, Mexico.

► More to explore

Mexico • Villa, Pancho

Zebra

Zebras are mammals that are known for their black and white stripes. They belong to the horse family of animals. There are three species, or types, of zebra: Burchell's zebra, Grevy's zebra, and the mountain zebra. They live in various parts of Africa.

Zebras look similar to horses. They stand between 47 and 55 inches (120

and 140 centimeters) tall at the shoulder. Each species of zebra has its own pattern of stripes. Burchell's zebra has broad stripes that are widely spaced. The stripes of Grevy's zebra are narrow and closely spaced, and the belly is white. The mountain zebra has a gridlike pattern of stripes on the rump.

Zebras eat mostly tall, rough grasses. Some types also eat shrubs, herbs, and bulbs. Zebras communicate with each other using calls and facial expressions. They often greet each other with nose-to-nose contact.

Female zebras may have one foal each year. Females and their young usually live in small family groups headed by one male. But female Grevy's zebras may form family groups without head males. Family groups sometimes join together in larger herds. Zebras also may form mixed herds with antelope.

Both Grevy's and mountain zebras are endangered, or in danger of dying out. People are trying to save zebras by breed-

ing them in captivity and then releasing them into the wild.

► More to explore

Horse • Mammal

Zapotec

The Zapotec are a group of American Indians who live in the state of Oaxaca in southern Mexico. Many Zapotec are farmers.

The Zapotec have lived in what is now Oaxaca since about 1500 BC. In about 500 BC they built a capital known as Monte Albán. This city had flat pyramids, temples, and elaborate tombs.

Like the Zapotec today, the early Zapotec were farmers. They also made fine pottery. In addition, they carved writings onto slabs of stone. This was some of the earliest writing in the Americas.

Zapotec lands once stretched from what is now Puebla (the state north of Oaxaca) to the Pacific Ocean. But after about AD 500 Monte Albán began to fall into ruin. A people called the Mixtec took over the city. The Zapotec later formed a number of small kingdoms. In the 1500s Spanish conquerors took over the region.

► More to explore

Mexico • Native Americans

Did You Know?

Zapotec in different villages sometimes speak different Zapotecan languages.



Zebras generally live in small groups.

Zeus

The most powerful god in ancient Greek mythology was Zeus. He was considered



According to Greek mythology, Zeus ruled over all the other gods as well as humans.

the ruler of all the other gods as well as of humans. Zeus was said to live on top of Mount Olympus with the other

major gods. From there, he could see everything that humans did. He sent thunder, lightning, rain, and winds down to Earth. Zeus is associated with the Roman god Jupiter because they shared many traits. Two of Zeus's symbols are the thunderbolt and the eagle. He used the thunderbolt as a weapon.

Zeus was said to punish those who angered him or did wrong. However, he rewarded those who behaved well. Zeus also was the protector of cities, the home, property, strangers, and guests.

According to legend, Zeus was the son of the Titans Cronus and Rhea. The Titans were giants who once ruled the world. Cronus heard that one of his children would destroy him. To prevent this, he swallowed his children right after they were born. But when Zeus was born, Rhea tricked Cronus. She had him swallow a rock wrapped in cloth rather than the baby. Rhea secretly sent Zeus to a cave to live. After he grew up, Zeus led a war to force the Titans from power. After 10 years Zeus won and became the chief god.

Zeus's wife was the goddess Hera. They had a stormy relationship. Zeus fell in love with many other goddesses and women, and Hera became very jealous. Zeus was the father of many children, including the gods Apollo and Ares and the goddesses Artemis and Athena. Athena was born from Zeus's forehead.

► More to explore

Hera • Mythology • Titans

Zimbabwe



Matusadona National Park is home to many animals, including herds of buffalo. The park lies along Lake Kariba in northern Zimbabwe.

Zimbabwe is a country in southern Africa. The British once ruled the land and called it Southern Rhodesia. A white government later called it just Rhodesia. Zimbabwe gained independence under a black government in 1980. The capital is Harare.

Geography

Zimbabwe shares borders with Zambia, Mozambique, South Africa, and Botswana. The country has a mild climate with dry and rainy seasons.

Zimbabwe lies on a plateau, or area of raised land. A ridge called the Highveld stretches from southwest to northeast. The Inyanga Mountains form Zimbabwe's eastern border. A line of hills, called the Great Dyke, runs from north to south through the middle of the country.

The Zambezi River forms Zimbabwe's border with Zambia. This river contains Victoria Falls, a huge waterfall. A major dam on the river created Lake Kariba.

Plants and Animals

Savanna, or grassland with scattered trees, covers much of Zimbabwe. Ever-green forests grow in the east. The country's animals include lions, hyenas, jackals, elephants, hippopotamuses, giraffes, gorillas, chimpanzees, baboons, antelope, and crocodiles.

People

Almost all of Zimbabwe's population is African. The main African groups are the Shona and the Ndebele. Europeans make up a tiny part of the population. English is the language of government, but the Shona and Ndebele languages are more commonly spoken. They belong to a large family of African languages called Bantu languages. About



half of the people follow Christianity. Many people also follow traditional African beliefs. Most people live in rural areas.

Economy

Zimbabwe's economy depends on agriculture. The most important crop is tobacco, which Zimbabwe sells to other countries. Other major crops include cotton, corn, and sugarcane. Farmers also raise cattle, goats, sheep, and pigs.

Mining is also important to the economy. Zimbabwe mines gold, nickel, coal, and other minerals in the hills of the Great Dyke. Zimbabwe's industries make food products, metals, clothing, chemicals, and wood products.

Facts About ZIMBABWE



Population
(2008 estimate)
11,350,000

Area
150,872 sq mi
(390,757 sq km)

Capital
Harare

Form of government
Republic

Major cities
Harare, Bulawayo, Chitungwiza, Mutare, Gweru

History

Some of the earliest people in the region were the San, or Bushmen. Bantu-speaking peoples came from the north between the AD 400s and 900s. They drove out the San.

Great Zimbabwe

The Bantu speakers built a city of stone in the southeast. It was the center of a rich trading empire from about 1100 to about 1500. The stone ruins at the site are called Great Zimbabwe. *Zimbabwe* is a Bantu word meaning “stone houses.”

Rhodesia

During the 1800s whites from South Africa and other Europeans settled on the land. In 1889 an Englishman named Cecil Rhodes formed the British South

Africa Company to start a colony and encourage trade. By 1897 the company controlled the region. The British called the land Southern Rhodesia in honor of Rhodes.

In 1923 Southern Rhodesia became a self-governing British colony. Even though most of the people of the colony were black, a small group of white people held all the power. In 1953 Southern Rhodesia joined with Northern Rhodesia (now Zambia) and Nyasaland (now Malawi) to form the Central African Federation. The federation broke up in 1963. Zambia and Malawi gained independence, but Southern Rhodesia went back to being a colony. In 1964 the colony was renamed Rhodesia.

Independence

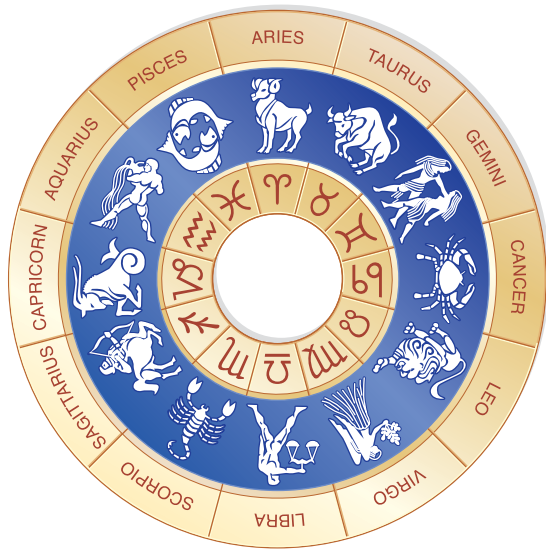
In 1965 Rhodesia's white government tried to declare independence from Great Britain. Black leaders in Rhodesia soon formed groups that attacked the white government. After years of fighting, the government allowed blacks to vote in elections in 1979.

Black leaders won more elections in 1980. Rhodesia became the independent country of Zimbabwe. One of the black leaders, Robert Mugabe, became Zimbabwe's first prime minister. Mugabe became president in 1987. He held power into the 21st century. In 2000 his government began taking land away from white farmers.

► More to explore

Great Zimbabwe • Harare

Zodiac



A chart shows the 12 signs of the zodiac.

The zodiac is a belt of space around Earth. It occupies the path that the sun appears to take around Earth in the course of a year (although it is actually Earth that is moving around the sun).

Twelve well-known groups of stars, called constellations, lie in the zodiac. Their names are Aries (the ram), Taurus (the bull), Gemini (the twins), Cancer (the crab), Leo (the lion), Virgo (the virgin), Libra (the balance), Scorpius (the scorpion), Sagittarius (the archer), Capricornus (the goat), Aquarius (the water bearer), and Pisces (the fish).

Ancient peoples saw how the sun appeared to pass in front of each constellation for about one month of the year. (During this time the constellation was not visible in the night sky.) Most of the constellations represent animals. Therefore the ancient Greeks called the zone *zodiakos kyklos*, “circle of animals,” or *ta zodia*, “the little animals.”

Each sign was associated with specific dates. The dates have changed because the path of Earth has changed over the years. Astrologers still use the old dates. Astrologers are people who claim to be able to predict the future based on the positions of the stars and the planets in the sky.

Zoo

A zoo is a place where animals are kept and shown to visitors. Zoos give people the chance to see animals that they might not see anywhere else.

How Zoos Display Animals

In most zoos the animals are kept in houses. Sometimes the houses are connected to fenced-in outdoor spaces. Animals that live peacefully together in nature are sometimes put together in displays. Cages, fences, and other barriers



Visitors to the San Diego Zoo walk through a glass-walled exhibit called the Hidden Jungle. There they see a variety of butterflies, birds, insects, and plants.



A zookeeper feeds a California condor chick that will be set free when it is grown. The keeper hides behind a puppet so that the bird will not lose its fear of humans. Many zoos try to help endangered animals like the California condor.

ers keep the animals from escaping. The barriers also keep zoo visitors from getting too close to the animals.

Zoos usually try to make the animals' surroundings look like natural habitats. Plants, trees, rocks, and other things animals would see in nature are included in the displays. Often these things are artificial instead of natural. Inside zoo buildings, light and temperature are set to the liking of the animals. For example, animals that are active at night are kept in buildings that are dark during the day and lighted at night.

Open-range zoos are large, outdoor zoos. In these zoos animals are kept in more natural conditions. Many open-space zoos have displays with just one type of animal, such as a group of lions. Others have displays with mixed groups

of animals. Some open-range zoos are so large that visitors can drive through in cars.

Purposes of Zoos

Zoos have a number of purposes. They try to teach visitors about the habitats and behavior of animals. They also work to protect endangered species, which are animals that are in danger of dying out in the wild. Some zoos help endangered animals to reproduce. Sometimes the animals are then returned to the wild.

History

Zoos date back to ancient times. Rulers of ancient China, Egypt, Greece, and Rome kept collections of animals. Some of these zoos were private. Others were open to the public. In the 1700s zoos were set up in major cities of Europe, including Vienna, Austria; Madrid, Spain; and Paris, France. By the middle of the 1800s zoos were being opened all over the world. Today there are more than 1,000 zoos.

► More to explore

Animal • Endangered Species

Zoology

Zoology is the study of animal life. Scientists who work in this field are called zoologists. They study all different kinds of animals, from tiny amoebas to humans to giant whales.

Zoology is divided into many different areas. The name of each is based on the group of animals that is studied. For



A zoologist goes underwater to study a mammal called a manatee.

example, entomology is the study of insects and mammalogy is the study of mammals.

Some zoologists examine animals' bodies and how they live. They may answer questions about how the animals behave, how their bodies work, or how they live in their environment. Other zoologists study how animals have evolved, or changed, over time. One of the greatest zoologists was Charles Darwin. He developed the theory of evolution.

Zoologists often study animals in the wild. They may also take animals back to a lab to study them more closely. They may draw or photograph the animals or look at them under a microscope.

Some zoologists study animals that are extinct, or no longer living. They may look at fossils, or remains, of extinct animals. Living relatives of extinct animals may also help zoologists understand how animals lived long ago.

► More to explore

Animal • Evolution

Zoroastrianism

The religion known as Zoroastrianism was founded in the 500s BC by an Iranian named Zoroaster. Most followers of the religion live in India. There the religion is known as Parsiism.

Zoroastrians believe the world is involved in a struggle between good and evil. They worship one supreme god, Ahura Mazda, the creator of the world and all good things. Evil is represented by Ahriman, creator of all bad things. Zoroastrians believe that in the end all evil will be destroyed. They are expected to turn away from evil. Giving to others and being truthful are important.

Children become Zoroastrians at age 7 or 10. They receive two sacred garments, a *sadre* (shirt) and *kusti* (girdle). They are to wear these garments through their whole lives.



Zoroastrian priests perform a ceremony to bring a child into the Zoroastrian religion.

Fire is an important symbol in Zoroastrianism. Followers of the religion say prayers every day, often in front of a fire. The main ceremony involves sacrificing a sacred liquor while reading from a sacred book called the Avesta. Zoroastrians also perform cleansing rituals to keep away evil spirits.

Zoroastrianism spread slowly from Persia (now Iran) to other countries. It became the official religion of Persia in AD 224. Eventually, Islam took over as the major religion there. Most Zoroastrians left Persia to settle in India. Today, followers of Zoroastrianism live in about 20 countries.

► More to explore

Islam • Persia

Zuni

The Zuni are Native Americans of western New Mexico. They are one of a group of tribes known as Pueblo Indi-



A Zuni potter makes a pot from coils, or long ropes, of clay in the early 1900s.

ans. They live in a pueblo, or village, that is also named Zuni. They call themselves Ashiwi.

Like other Pueblo Indians, the Zuni traditionally built large houses with several stories. They built the houses out of blocks of sun-baked clay, called adobe. The Zuni grew corn, squash, beans, and sunflowers. They also fished and hunted deer, antelope, and other animals.

In 1539 a black slave named Estéban arrived in Zuni lands. He had come from Mexico with a Spanish priest named Marcos de Niza. Niza was looking for the Seven Cities of Cíbola, famed cities of great wealth that did not actually exist. Niza sent Estéban ahead to meet the Zuni. The Zuni killed Estéban, and Niza went back to Mexico. He announced that he had found the Seven Cities. Then other Spanish explorers went through Zuni lands looking for the cities. The most famous of the explorers was Francisco Coronado.

In 1680 the Zuni joined in a Pueblo rebellion against the Spanish. The Pueblo drove the Spanish from their territory for 12 years. When the Spanish returned, they crowded all of the Zuni into one village, called Halona. That is where Zuni Pueblo still stands. At the end of the 20th century there were more than 9,000 Zuni.

► More to explore

Coronado, Francisco • Native Americans • Pueblo Indians

Britannica Student Encyclopedia

W-X-Y-Z





Britannica Student Encyclopedia

INDEX

Britannica Student Encyclopedia

Index



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The index can help you find information in several different ways.

If you know the name of the subject you want to read about, you can look up that name. If the encyclopedia has an article on that subject then the index will tell you the volume and page number where you will find that article.

exercise (physical activity)

MAIN ARTICLE *volume 4 page 171*

Sometimes other articles also have information about that subject. The index will tell you when there is more information about a topic in another article.

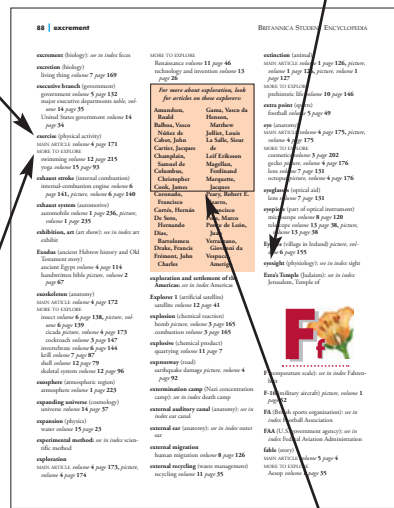
MORE TO EXPLORE

swimming *volume 12 page 215*
yoga *volume 15 page 93*

Sometimes the encyclopedia has information on the subject, but it is under a different name. The index will tell you what name to look under.

eyesight (physiology): *see in index sight*

The index also has many tables that can help you find a subject. For example, if your teacher asks you to do a report on a famous African American you can look up “African American” in the index. You will find a table that lists some famous African Americans. The encyclopedia has an article on each name in that list. There are more than 30 subject lists throughout the index. They include lists of every country on each continent as well as lists of science topics, arts, world leaders, and many more.



For more about exploration, look for articles on these explorers:

Amundsen, Roald	Gama, Vasco da
Balboa, Vasco	Henson, Matthew
Núñez de Cabot, John	Jolliet, Louis
Cartier, Jacques	La Salle, Sieur de
Champlain, Samuel de	Leif Eriksson
Columbus, Christopher	Magellan, Ferdinand
Cook, James	Marquette, Jacques

Index



Aachen (city in Germany)

Charlemagne *volume 3 page 82*

aardvark (mammal)

MAIN ARTICLE *volume 1 page 6, picture, volume 1 page 6*

Aaron, Hank (U.S. baseball player)

MAIN ARTICLE *volume 1 page 6, picture, volume 1 page 6*

MORE TO EXPLORE

Ruth *volume 11 page 109*

abacus (calculating device)

MAIN ARTICLE *volume 1 page 7*

‘Abbasid Caliphate (Islamic history)

Caliphate *volume 3 page 14*

abbreviation (grammar)

MAIN ARTICLE *volume 1 page 7*

MORE TO EXPLORE

some common abbreviations *table, volume 1 page 8*

United States postal codes *table, volume 1 page 8*

abdomen (anatomy)

insect *volume 6 page 139, picture, volume 6 page 138*

spider *volume 12 page 164*

Abenaki (people): *see in index* Abnaki

Abernathy, Ralph (U.S. civil-rights activist)

MAIN ARTICLE *volume 1 page 9, picture, volume 1 page 9*

Abidjan (city in Côte d’Ivoire)

MAIN ARTICLE *volume 1 page 9, picture, volume 1 page 10*

MORE TO EXPLORE

Côte d’Ivoire *volume 3 page 204*

Yamoussoukro *volume 15 page 85*

Abnaki (Native American people)

MAIN ARTICLE *volume 1 page 10*

abolitionist movement (European and U.S. social movement)

MAIN ARTICLE *volume 1 page 11*

MORE TO EXPLORE

African Americans *volume 1 page 43*

Freetown *volume 5 page 65*

Fugitive Slave Acts *volume 5 page 74*

Harpers Ferry *volume 6 page 19*

important people

Anthony *volume 1 page 140*

Arthur *volume 1 page 192*

Brown *volume 2 page 136*

Douglass *volume 4 page 67*

Franklin *volume 5 page 64*

Grimké sisters *volume 5 page 161*

Truth *volume 13 page 102*

London meeting *picture, volume 1 page 11*

slavery *volume 12 page 107*

Underground Railroad *volume 14 page 9*

Abolition Society (British organization)

abolitionist movement *volume 1 page 11*

Abominable Snowman (mythology)

legendary animals *volume 1 page 129*

Nepal *volume 9 page 31*

Aboriginal, Australian (people): *see in index* Australian Aborigine

aboriginal peoples (classification of people)

MAIN ARTICLE *volume 1 page 13*

aborigine (classification of people): *see in index* aboriginal peoples

Abraham (Hebrew patriarch)

MAIN ARTICLE *volume 1 page 13*

MORE TO EXPLORE

journey to Canaan *picture, volume 1 page 14*

Judaism *volume 7 page 38*

Absaroka (Native American people): *see in index* Crow

absolutism (form of government)

dictatorship *volume 4 page 46*

government *volume 5 page 132*

monarchy *volume 8 page 159*

abstract art

painting *volume 10 page 11*

“Painting” by Miró *picture, volume 10 page 12*

sculpture *volume 12 page 57*

work by Hepworth *picture, volume 12 page 57*

abstract expressionism (artistic style)

painting *volume 10 page 11*

Absurd, Theater of the

drama *volume 4 page 74*

Abu Bakr (Muslim caliph)

MAIN ARTICLE *volume 1 page 14, picture, volume 1 page 14*

MORE TO EXPLORE

Caliphate *volume 3 page 14*

Abu Dhabi (capital city of the United Arab Emirates)

MAIN ARTICLE *volume 1 page 15, picture, volume 1 page 15*

MORE TO EXPLORE

United Arab Emirates *volume 14 page 15*

Abuja (capital city of Nigeria)

MAIN ARTICLE *volume 1 page 16, picture, volume 1 page 16*

MORE TO EXPLORE

Nigeria *volume 9 page 68*

Abu Simbel (archaeological site in Egypt)

temple entrance *picture, volume 4 page 112*

Acadia (historical region in Canada)

Maine *volume 8 page 23*

New Brunswick *volume 9 page 43*

accident (safety)

safety *volume 12 page 7*

Accra (capital city of Ghana)

MAIN ARTICLE *volume 1 page 16*

MORE TO EXPLORE

Ghana *volume 5 page 110*

ace (sports)

tennis *volume 13 page 46*

acetate (textile fiber)

fibers *volume 5 page 17*

acetic acid (chemical compound)
vinegar *volume 14 page 92*

acid (chemical substance)
MAIN ARTICLE *volume 1 page 17*, picture,
volume 1 page 17

acid dew (pollution)
dew *volume 4 page 42*

acid rain (pollution)
MAIN ARTICLE *volume 1 page 18*, picture,
volume 1 page 18

MORE TO EXPLORE
fossil fuel *volume 5 page 56*
coal *volume 3 page 145*
petroleum *volume 10 page 68*
pollution *volume 10 page 118*
rain *volume 11 page 22*

acne (skin condition)
MAIN ARTICLE *volume 1 page 18*, picture,
volume 1 page 19

Acoma (pueblo in New Mexico, U.S.)
New Mexico *picture, volume 9 page 52*

Aconcagua, Mount (mountain in Argentina)
Andes Mountains *volume 1 page 118*
Argentina *volume 1 page 175*

acorn (fruit)
nut *volume 9 page 112*
oak *volume 9 page 114*

acquired immune deficiency syndrome
(disease): *see in index AIDS*

acquired immunity (physiology)
immune system *volume 6 page 119*,
picture, *volume 6 page 119*

acro (skiing)
skiing *volume 12 page 99*

acronym (grammar)
abbreviation *volume 1 page 8*

Acropolis (ancient citadel in Athens, Greece)
MAIN ARTICLE *volume 1 page 19*
MORE TO EXPLORE
Athens *volume 1 page 218*

Act Declaring the Rights and Liberties of the Subject and Settling the Succession of the Crown, An (British history): *see in index Rights, Bill of*

acting (theatrical arts)
theater *volume 13 page 57*

actinide element (family of chemical elements)
periodic table *table, volume 3 page 86*

Actium, Battle of (ancient Roman history, 31 BC)
Cleopatra *volume 3 page 135*

Act of Union (Great Britain and Ireland, 1801): *see in index Union, Act of*

Acts of the Apostles, The (New Testament)
Bible *volume 2 page 68*

acupuncture (Chinese medical technique)
MAIN ARTICLE *volume 1 page 20*, picture,
volume 1 page 20

acute angle (mathematics)
geometry *volume 5 page 98*

AD (division of time for dating events):
see in index anno Domini

Adams, Abigail (first lady of the U.S.)
MAIN ARTICLE *volume 1 page 20*, picture,
volume 1 page 21
MORE TO EXPLORE
Adams, John Quincy *volume 1 page 24*

Adams, Ansel (U.S. photographer)
MAIN ARTICLE *volume 1 page 21*, picture,
volume 1 page 22

Adams, John (president of the U.S.)
MAIN ARTICLE *volume 1 page 22*, picture,
volume 1 page 22
MORE TO EXPLORE
Adams, Abigail *volume 1 page 20*
Adams, John Quincy *volume 1 page 24*
timeline *volume 1 page 22*
White House *volume 15 page 42*

Adams, John Quincy (president of the U.S.)
MAIN ARTICLE *volume 1 page 24*, picture,
volume 1 page 24

MORE TO EXPLORE
Abigail Adams *volume 1 page 21*
timeline *volume 1 page 24*

Adams, Louisa (first lady of the U.S.)
Adams, John Quincy *volume 1 page 24*

Adams, Samuel (U.S. politician)
MAIN ARTICLE *volume 1 page 26*, picture,
volume 1 page 26
MORE TO EXPLORE
Revere *volume 11 page 58*

adaptation (biology and physiology)
MAIN ARTICLE *volume 1 page 26*, picture,
volume 1 page 27

MORE TO EXPLORE
cave *volume 3 page 64*
evolution *volume 4 page 171*
fish *volume 5 page 27*
habitat *volume 6 page 4*

ADD (medical disorder): *see in index attention-deficit/hyperactivity disorder*

Addams, Jane (U.S. social reformer)
MAIN ARTICLE *volume 1 page 27*, picture,
volume 1 page 27

addax (mammal)
antelope *volume 1 page 138*

adder (reptile)
scales *picture, volume 11 page 51*

Addis Ababa (capital city of Ethiopia)
MAIN ARTICLE *volume 1 page 28*, picture,
volume 1 page 28

MORE TO EXPLORE
African Union *volume 1 page 46*
Ethiopia *volume 4 page 155*

Ade, King Sunny (Nigerian musician)
world music *volume 15 page 60*

Adelaide (state capital of South Australia, Australia)
South Australia *volume 12 page 145*

Adena culture (prehistoric North American culture)
MAIN ARTICLE *volume 1 page 29*

MORE TO EXPLORE
Adena burial mound *picture, volume 1 page 29*
mound builders *volume 8 page 194*
Serpent Mound *picture, volume 8 page 194*

adenine (chemical compound)
DNA *volume 4 page 61*

ADHD (medical disorder): *see in index attention-deficit/hyperactivity disorder*

“Adi Granth” (Sikh sacred scripture)
Sikhism *volume 12 page 88*, picture,
volume 12 page 88

Adirondack Mountains (mountain range in New York, U.S.) *picture, volume 9 page 57*, picture, *volume 9 page 79*

'Adnan (Arab legendary figure)
Arabs *volume 1 page 159*

adobe (building material)

MAIN ARTICLE *volume 1 page 29, picture, volume 1 page 30, picture, volume 10 page 164*

MORE TO EXPLORE

brick and tile *volume 2 page 129*

adolescence (stage of human development)

MAIN ARTICLE *volume 1 page 30*

MORE TO EXPLORE

acne *volume 1 page 18*

adrenal gland (anatomy)

endocrine system *volume 4 page 136, picture, volume 4 page 135*

Adriatic Sea (Mediterranean Sea)

MAIN ARTICLE *volume 1 page 31*

MORE TO EXPLORE

coastline in Dalmatia region *picture, volume 3 page 218*

harbor of Dubrovnik, Croatia *picture, volume 6 page 17*

Mediterranean Sea *volume 8 page 94*

Montenegro *picture, volume 8 page 175*

adult education

education *volume 4 page 106*

adulthood

sleep *volume 12 page 108*

adult insect

flea *volume 5 page 33*

insects *volume 6 page 140*

adult learning: *see in index* adult education

“Advance Australia Fair” (Australian national anthem)

national anthem *volume 9 page 13*

Advanced Research Projects Agency Network (U.S. computer network)

Internet *volume 6 page 142*

“Adventures of Huckleberry Finn, The” (novel by Twain)

Twain *volume 13 page 122*

“Adventures of Tom Sawyer, The” (novel by Twain)

Twain *volume 13 page 122*

advertising (promotion)

MAIN ARTICLE *volume 1 page 32, picture, volume 1 page 32*

MORE TO EXPLORE

magazine *volume 8 page 15*

Aegean civilization (ancient Greece)

MAIN ARTICLE *volume 1 page 33, picture, volume 1 page 33*

MORE TO EXPLORE

ancient Greece *volume 5 page 154*

Aegean Sea (Mediterranean Sea)

MAIN ARTICLE *volume 1 page 34, picture, volume 1 page 34*

MORE TO EXPLORE

Mediterranean Sea *volume 8 page 94*

Aeneas (Roman mythology)

Aphrodite *volume 1 page 149*

aepyornis (extinct bird): *see in index*

elephant bird

aerial (skiing)

skiing *volume 12 page 99*

aerial root (root system)

root *volume 11 page 96*

aerobic exercise

exercise *volume 4 page 172*

aerodynamics (physics)

airplane *volume 1 page 56*

aerospace industry

Oklahoma City *volume 9 page 131*

Aesop (legendary Greek fable teller)

MAIN ARTICLE *volume 1 page 35, picture, volume 1 page 35*

MORE TO EXPLORE

fable *volume 5 page 4*

Afar (people)

Djibouti *volume 4 page 59*

affirmative action (U.S. government and social policy)

civil rights movement *volume 3 page 131*

Afghan hound (breed of dog)

hound breeds *table, volume 4 page 62*

Afghanistan (country in Asia)

MAIN ARTICLE *volume 1 page 36*

MORE TO EXPLORE

history

refugee *volume 11 page 41, picture, volume 11 page 41*

Soviet Union *volume 14 page 14*

terrorism

bin Laden *volume 2 page 71*

United States *picture, volume 2 page 104*

Mazar-e Sharif *picture, volume 1 page 37*

outdoor theater in Kabul *picture, volume 13 page 59*

public health *picture, volume 3 page 110*

AFL (labor organization): *see in index*

American Federation of Labor

AFL-CIO (labor organization)

labor *volume 7 page 97*

Africa (continent)

MAIN ARTICLE *volume 1 page 38*

MORE TO EXPLORE

animals

baboons *picture, volume 8 page 168*

elephants *picture, volume 3 page 180*

giraffes *picture, volume 1 page 38, picture, volume 5 page 116*

hippopotamus *picture, volume 6 page 59*

lions *picture, volume 2 page 116, picture, volume 7 page 158*

mongoose *picture, volume 8 page 165*

rhinoceros *picture, volume 11 page 59*

wildebeests and zebras *picture, volume 8 page 125*

wood storks *picture, volume 12 page 191*

geography and geology

Cameroon's rain forest *picture, volume 11 page 23*

Great Zimbabwe *picture, volume 5 page 149*

Kalahari *volume 7 page 44*

Lake Nyasa *picture, volume 8 page 26*

Lake Victoria *picture, volume 14 page 80*

Malabo coast *picture, volume 8 page 25*

Moroccan kasbah ruins *picture, volume 1 page 42*

Mount Kilimanjaro *volume 7 page 65, picture, volume 7 page 65*

Namib desert *picture, volume 9 page 6*

Simien Mountains *picture, volume 4 page 155*

Ugandan mountains *picture, volume 14 page 5*

history

African Union *volume 1 page 46*

empire *volume 4 page 132*

Johnson-Sirleaf *picture, volume 7 page 139*

North America *volume 9 page 81*

Nubia: *see in index* Nubia

slavery *volume 12 page 106*

human migration *volume 8 page 126*

people and culture

human origins *volume 6 page 96*

images

Angolan woman carrying fruit *picture, volume 7 page 183*

children in South Africa *picture, volume 1 page 40*

Cotonou *picture, volume 3 page 205*

drummers in Burundi *picture, volume 2 page 153*

education *picture, volume 4 page 107*

Enya people fishing *picture, volume 3 page 180*

musician *picture, volume 8 page 214*

Namibian mother and child *picture, volume 9 page 7*

nomads in Somalia *picture, volume 9 page 76*

school in Mogadishu *picture, volume 8 page 151*

traditional dance in Burundi *picture, volume 2 page 147*

traditional villages *picture, volume 2 page 60, picture, volume 2 page 151, picture, volume 9 page 67*

water jugs *picture, volume 4 page 156*

Zulu prince *picture, volume 12 page 138*

Africa, Horn of (region in Eastern Africa)

Somalia *volume 12 page 130*

African American (people)

MAIN ARTICLE *volume 1 page 43*

MORE TO EXPLORE

107th U.S. Colored Infantry *picture, volume 1 page 96*

arts

Anderson *volume 1 page 116*

blues *volume 2 page 95*

folk music *volume 5 page 41*

gospel music *volume 5 page 130*

Hansberry *volume 6 page 14*

jazz *volume 7 page 16*

Morrison *picture, volume 1 page 45*

rap *volume 11 page 26*

civil rights and equality

Alabama *volume 1 page 61*

civil rights movement *volume 3 page 129*

desegregation

Arkansas *picture, volume 1 page 181*

Supreme Court school decision *picture, volume 1 page 44*

For more about Africa, look for articles on these countries:

Algeria	Kenya
Angola	Lesotho
Benin	Liberia
Botswana	Libya
Burkina Faso	Madagascar
Burundi	Malawi
Cameroon	Mali
Cape Verde	Mauritania
Central African Republic	Mauritius
Chad	Morocco
Comoros	Mozambique
Congo,	Namibia
Democratic Republic of the	Niger
Congo,	Nigeria
Republic of the	Rwanda
Côte d'Ivoire	São Tomé and Príncipe
Djibouti	Senegal
Egypt	Seychelles
Equatorial Guinea	Sierra Leone
Eritrea	Somalia
Ethiopia	South Africa
Gabon	Sudan
Gambia, The	Swaziland
Ghana	Tanzania
Guinea	Togo
Guinea-Bissau	Tunisia
	Uganda
	Zambia
	Zimbabwe

Emancipation Proclamation *volume 4 page 130*

Evers *volume 4 page 168*

Ku Klux Klan opposition *volume 7 page 89*

National Association for the Advancement of Colored People *volume 9 page 13*

protests

1968 Olympic Games *picture, volume 1 page 44*

restaurant in Oklahoma *picture, volume 3 page 130*

Reconstruction *volume 11 page 33*

Roosevelt, Eleanor *volume 11 page 91*

Truth *volume 13 page 102*

Tuskegee Airmen *volume 13 page 118*
poster from World War II *picture, volume 13 page 118*

United States history *volume 14 page 31*

voting *volume 14 page 105*

Grant *volume 5 page 138*

Johnson *volume 7 page 29*

Wells-Barnett *volume 15 page 29*

World War I soldiers *picture, volume 15 page 63*

education

Bethune *volume 2 page 65*

Washington *volume 15 page 17*

Fugitive Slave Act handbill *picture, volume 5 page 73*

Jemison *volume 7 page 20*

Kwanzaa *volume 7 page 93*

sports

Ashe *volume 1 page 199*

Campanella, Doby, Newcombe, and Robinson *picture, volume 2 page 32*

Rudolph *volume 11 page 101*

For more about African Americans, look for these articles:

Abernathy, Ralph	Jemison, Mae
Ailey, Alvin	King, Martin
Banneker, Benjamin	Luther, Jr.
Bethune, Mary McLeod	Malcolm X
Brooks, Gwendolyn	Marshall, Thurgood
Bunche, Ralph	Meredith, James
Carver, George Washington	Obama, Barack
Douglass, Frederick	Powell, Colin
DuBois, W.E.B.	Truth,
Evers, Medgar	Sojourner
Garvey, Marcus	Tubman,
Jackson, Jesse	Harriet
	Turner, Nat
	Washington,
	Booker T.
	Wells-Barnett,
	Ida B.

African black rhino (mammal): *see in index* black rhinoceros

African buffalo (mammal): *see in index* Cape buffalo

African forest elephant (mammal)
elephant *volume 4 page 123*

African gray parrot (bird)
parrot family *volume 10 page 38*

African manatee (mammal)
manatee *volume 8 page 39*

African music
world music *volume 15 page 60*

African National Congress (political party in South Africa)

MAIN ARTICLE *volume 1 page 45*

MORE TO EXPLORE

apartheid *volume 1 page 145*

Mandela *volume 8 page 41*

South Africa *volume 12 page 139*

African pygmy squirrel (rodent)

squirrel *volume 12 page 173*

African savanna elephant (mammal)

picture, *volume 4 page 123*

elephant *volume 4 page 123*

African Union (intergovernmental organization)

MAIN ARTICLE *volume 1 page 46*, picture, *volume 1 page 46*

African Unity, Organization of (inter-governmental organization)

African Union *volume 1 page 46*

African wood stork (bird) picture, *volume 12 page 191*

Afrikaner (Dutch-South African people): *see in index* Boer

agent, intelligence (intelligence): *see in index* spy

Age of Mammals: *see in index* Cenozoic era

Age of Reason (European history): *see in index* Enlightenment

Age of Reptiles (prehistoric time period): *see in index* Mesozoic era

aggregate fruit (botany)
berry *volume 2 page 64*

aging (life process)

MAIN ARTICLE *volume 1 page 47*, picture, *volume 1 page 47*

MORE TO EXPLORE

Alzheimer's disease *volume 1 page 91*

death *volume 4 page 22*

sleep *volume 12 page 108*

Agnew, Spiro T. (vice president of the U.S.)

Ford *volume 5 page 52*

Agra (city in India)

tomb picture, *volume 1 page 170*

agricultural industry

industry *volume 6 page 134*

agriculture

MAIN ARTICLE *volume 1 page 48*

MORE TO EXPLORE

Africa

Malawi *volume 8 page 26*

Mali *volume 8 page 32*

Morocco picture, *volume 8 page 184*

Asia

Malaysia picture, *volume 8 page 28*,

picture, *volume 13 page 24*

Pakistan *volume 10 page 14*

Saudi Arabia picture, *volume 6*

page 161

Vietnam picture, *volume 1 page 48*,

picture, *volume 14 page 85*

cooperative picture, *volume 6 page 169*

Demeter *volume 4 page 34*

erosion *volume 4 page 153*

Europe *volume 4 page 163*

France picture, *volume 6 page 162*

farm: *see in index* farm

grains: *see in index* grain

Green Revolution *volume 5 page 159*

irrigation *volume 6 page 160*

micro-jet irrigation system picture,

volume 1 page 49

Mauritius picture, *volume 8 page 80*

North America *volume 9 page 82*

Chavez *volume 3 page 83*

Manitoba picture, *volume 8 page 45*

Mexico picture, *volume 9 page 82*

pioneer life *volume 10 page 88*

seaweed farming picture, *volume 7*

page 71

South America

Paraguay *volume 10 page 30*

Peru picture, *volume 10 page 65*

Stone Age *volume 12 page 189*

veterinary medicine *volume 14 page 75*

Agriculture, Department of (U.S. government agency)

United States government executive

departments table, *volume 14 page 35*

ahimsa (religious doctrine)

Hinduism *volume 6 page 56*

Ahmad Shah Durrani (ruler of Afghanistan)

Afghanistan *volume 1 page 37*

Ahriman (Zoroastrian evil spirit)

Zoroastrianism *volume 15 page 109*

Ahura Mazda (Zoroastrian deity)

Zoroastrianism *volume 15 page 109*

AI: *see in index* artificial intelligence

AIDS (disease)

MAIN ARTICLE *volume 1 page 49*

MORE TO EXPLORE

Africa *volume 1 page 41*

AIDS Memorial Quilt picture, *volume 1 page 49*

epidemic *volume 4 page 146*

immune system *volume 6 page 120*

people

Ashe *volume 1 page 199*

Johnson *volume 7 page 30*

AIDS Memorial Quilt picture, *volume 1 page 49*

Aigams (capital city of Namibia): *see in index* Windhoek

aileron (aircraft part)

airplane *volume 1 page 54*

Ailey, Alvin (U.S. dance artist)

MAIN ARTICLE *volume 1 page 50*

AIM (U.S. civil rights organization): *see in index* American Indian Movement

air (atmospheric gas)

MAIN ARTICLE *volume 1 page 51*

MORE TO EXPLORE

cloud *volume 3 page 143*

dew *volume 4 page 42*

air bag (restraint system)

automobile *volume 1 page 237*

aircraft: *see in index* airplane; airship; balloon; glider; helicopter

aircraft carrier (warship) picture, *volume 9 page 25*, picture, *volume 12 page 82*

navy *volume 9 page 25*

ship *volume 12 page 82*

aircraft industry: *see in index* aerospace industry

air force (military branch)

MAIN ARTICLE *volume 1 page 51*

Air Force, United States (military): *see in index* United States Air Force, The

airframe (aircraft structure)

airplane *volume 1 page 54*

airline (commercial aviation)

airplane *volume 1 page 57*

air navigation

navigation *volume 9 page 25*

airplaneMAIN ARTICLE *volume 1 page 52*

MORE TO EXPLORE

images

aircraft carrier *picture, volume 9**page 25*bomber *picture, volume 2 page 104*early airplane *picture, volume 1**page 57*F-16 *picture, volume 1 page 52*passenger airplane *picture, volume 1**page 53*propeller airplane *picture, volume 1**page 56*seaplane *picture, volume 1 page 53*World War I air combat *picture, vol-**ume 15 page 64*World War II production *picture, vol-**ume 15 page 69*transportation *volume 13 page 93*war *volume 15 page 10*World War I *volume 15 page 64*ambulance *volume 1 page 93*Wright brothers *volume 15 page 75***air plant** (type of plant): *see in index* epiphyte**air pollution**automobile *volume 1 page 237*chemical plants *picture, volume 10**page 117*ozone *volume 9 page 160*pollution *volume 10 page 117*Taj Mahal *volume 13 page 11*transportation *volume 13 page 93***air power** (military technology)navy *volume 9 page 26***air pressure:** *see in index* atmospheric pressure**airship**MAIN ARTICLE *volume 1 page 58*

MORE TO EXPLORE

airship flies over Dodger Stadium *pic-**ture, volume 1 page 58*polar exploration *volume 10 page 111***air traffic control**navigation *volume 9 page 25***air transportation:** *see in index* aviation**airway** (anatomy): *see in index* respiratory system**Aix-la-Chapelle** (city in Germany): *see in index* Aachen**Akagera River** (river in Africa): *see in index* Kagera River**Akansa** (Native American people): *see in index* Quapaw**Akbar** (Mughal emperor)Mughal Empire *volume 8 page 202***Akhenaton** (king of Egypt)Tutankhamen *volume 13 page 119***Akimel O'odham** (Native American people): *see in index* Pima**Akkad** (historical region in Mesopotamia, Asia)Mesopotamia *volume 8 page 104***Akmola** (capital city of Kazakhstan): *see in index* Astana**Akmolinsk** (capital city of Kazakhstan): *see in index* Astana**Akosombo Dam** (dam in Ghana)Ghana *volume 5 page 110***Aksum** (ancient kingdom in Africa)MAIN ARTICLE *volume 1 page 59, picture, volume 1 page 59*

MORE TO EXPLORE

civilization *volume 3 page 127*Ethiopia *volume 4 page 156***Aksum** (city in Ethiopia)ancient kingdom of Aksum *volume 1**page 59, picture, volume 1 page 59***AL** (baseball organization): *see in index* American League**al-** (Arabic definite article): *see in index under the specific part of the name, for example, Khwarizmi, al- except as found below***ALA** (U.S. organization): *see in index*

American Library Association

Alabama (state in the U.S.)MAIN ARTICLE *volume 1 page 60*

MORE TO EXPLORE

combine harvesting cotton *picture, vol-**ume 1 page 61*electoral college vote certificate *picture,**volume 4 page 119***Alamo** (monument in San Antonio, Texas, U.S.)MAIN ARTICLE *volume 1 page 62, picture, volume 1 page 62*

MORE TO EXPLORE

Texas *volume 13 page 52***Alaska** (state in the U.S.)MAIN ARTICLE *volume 1 page 63*

MORE TO EXPLORE

geography and climate

Bering Sea *picture, volume 2 page 61*Juneau *picture, volume 7 page 39*marshland *picture, volume 8 page 60*Mount McKinley *picture, volume 8**page 86*oil pipeline *picture, volume 14 page 27*

Wrangell-Saint Elias National Park

*picture, volume 1 page 64*gold rush *volume 5 page 124, picture,**volume 5 page 124*

Native Americans

Aleut *volume 1 page 72*Tlingit gathering *picture, volume 13**page 72***Alaska Native Brotherhood** (U.S. civil-rights organization)Tlingit *volume 13 page 71***Alawma, Idris** (king of Kanem-Bornu)Kanem-Bornu Empire *volume 7 page 46***Albania** (country in Europe)MAIN ARTICLE *volume 1 page 65*

MORE TO EXPLORE

farmworkers *picture, volume 1 page 66*

geography

citadel at Krujë *picture, volume 1**page 65*rye harvest *picture, volume 11**page 111*Tiranë *picture, volume 13 page 69***Albany** (state capital of New York, U.S.)MAIN ARTICLE *volume 1 page 67*

MORE TO EXPLORE

New York *volume 9 page 57*statehouse building *picture, volume 1**page 67***Albany Congress** (North American colonial history, 1754)MAIN ARTICLE *volume 1 page 67, picture, volume 1 page 67***albatross** (seabird)MAIN ARTICLE *volume 1 page 68*

MORE TO EXPLORE

black-browed albatross *picture, volume 1**page 68***Albemarle** (island of Ecuador): *see in index* Isabela Island

Albert I (prince of Monaco)
Monaco *volume 8 page 158*

Albert II (prince of Monaco)
Monaco *volume 8 page 158*

Alberta (province in Canada)
MAIN ARTICLE *volume 1 page 69*
MORE TO EXPLORE

geography
Banff National Park *picture, volume 3 page 23*
Calgary *picture, volume 1 page 70*
Lake Louise *picture, volume 1 page 69*

albinism (medical disorder)
genetics *volume 5 page 94*

Al Bu Sa'id family (Omani dynasty)
Oman *volume 9 page 136*

Alcatraz Island (island in San Francisco Bay, California, U.S.)
Native American claims and protests
picture, volume 9 page 20

alchemy (pseudoscience)
MAIN ARTICLE *volume 1 page 71*
MORE TO EXPLORE
alchemists at work *picture, volume 1 page 71*

Alcmene (Greek mythology)
Heracles *volume 6 page 44*

alcohol (chemical compound)
fermentation *volume 5 page 11*

Alcott, Louisa May (U.S. author)
MAIN ARTICLE *volume 1 page 71, picture, volume 1 page 71*

Aldrin, Edwin E., Jr. (U.S. astronaut)
Armstrong *volume 1 page 189*
exploration *volume 4 page 174*
Moon *volume 8 page 180*

Alemanni (people)
Liechtenstein *volume 7 page 147*

Aleut (Native American people)
MAIN ARTICLE *volume 1 page 72*
MORE TO EXPLORE
Aleut girl *picture, volume 1 page 72*

Aleutian Islands (island chain in Alaska, U.S.)
Alaska *volume 1 page 63*
Aleut *volume 1 page 72*

Alexander, Lloyd (U.S. author)
MAIN ARTICLE *volume 1 page 74, picture, volume 1 page 74*

Alexander Nevsky Cathedral (church in Sofia, Bulgaria) *picture, volume 12 page 122*

Alexander Nevsky Cathedral (church in Tallinn, Estonia) *picture, volume 13 page 13*

Alexander the Great (king of Macedonia)
MAIN ARTICLE *volume 1 page 72, picture, volume 1 page 73*
MORE TO EXPLORE
ancient Greece *volume 5 page 156*
Egypt
Alexandria *volume 1 page 74*
ancient Egypt *volume 4 page 115*
exploration *volume 4 page 173*

Alexandria (city in Egypt)
MAIN ARTICLE *volume 1 page 74, picture, volume 1 page 75*
MORE TO EXPLORE
Alexander the Great *volume 1 page 74*

Alexandria, Library of (ancient library in Alexandria, Egypt)
ancient Egypt *volume 4 page 115*
library *volume 7 page 143*

Alfred P. Murrah Federal Building (building in Oklahoma City, Oklahoma, U.S.)
Oklahoma City *volume 9 page 131*

Alfred the Great (king of Wessex)
MAIN ARTICLE *volume 1 page 75, picture, volume 1 page 76*

algae (organism)
MAIN ARTICLE *volume 1 page 76, picture, volume 1 page 77*
MORE TO EXPLORE
lichen *volume 7 page 146*
ocean *volume 9 page 118*
red algae *picture, volume 1 page 77*
sloth *volume 12 page 108*

algebra (mathematics)
Khwarizmi *volume 7 page 61*
mathematics *volume 8 page 77*

Algeria (country in North Africa)
MAIN ARTICLE *volume 1 page 78, picture, volume 1 page 78, picture, volume 1 page 79*
MORE TO EXPLORE
palm trees in distant oasis *picture, volume 12 page 8*

Algiers (capital city of Algeria)

MAIN ARTICLE *volume 1 page 80, picture, volume 1 page 80*

MORE TO EXPLORE
Algeria *volume 1 page 78*

Algiers, Bay of (bay in Algeria)
Algiers *picture, volume 1 page 80*

Algonkian (Native American language and people group): *see in index* Algonquian

Algonkin (Native American people): *see in index* Algonquin

Algonquian (Native American language and people group)
MAIN ARTICLE *volume 1 page 80*
MORE TO EXPLORE
New Brunswick *volume 9 page 43*
Ontario *volume 9 page 140*

Algonquin (Native American people)
MAIN ARTICLE *volume 1 page 81*
MORE TO EXPLORE
Algonquian *volume 1 page 80*
Algonquin village *picture, volume 1 page 81*

Alhambra (fortress in Granada, Spain)
picture, volume 12 page 156
Court of the Lions *picture, volume 8 page 180*

'Ali (Muslim caliph)
Caliphate *volume 3 page 14*

Ali, Muhammad (U.S. boxer)
MAIN ARTICLE *volume 1 page 82, picture, volume 1 page 82*

MORE TO EXPLORE
physical measurements *table, volume 12 page 183*
with Michael J. Fox *picture, volume 10 page 35*

"Alice's Adventures in Wonderland" (work by Carroll)
Carroll *volume 3 page 43*
literature for children *volume 7 page 164*
Tenniel illustration *picture, volume 3 page 43*

alien (law)
citizenship *volume 3 page 121*

Alien and Sedition Acts (U.S. history, 1798)
Adams *volume 1 page 24*

‘Ali Mohammad, Mirza (Iranian religious leader): *see in index* Bab, the

alkaloid (chemical compound)
nightshade *volume 9 page 72*

Allada (historical kingdom in West Africa)
Dahomey *volume 4 page 5*

Allah (deity)
Islam *volume 6 page 163*
Koran *volume 7 page 77*

Allahabad (city in India)
pilgrimage *volume 10 page 85*

Allegheny Mountains (mountain range in the U.S.)

MAIN ARTICLE *volume 1 page 82, picture, volume 1 page 83*

MORE TO EXPLORE

Pennsylvania *volume 10 page 55*
West Virginia *volume 15 page 34*

Allegheny River (river in the U.S.)
Monongahela and Ohio rivers *picture, volume 10 page 57*
Ohio River *volume 9 page 127*

Allen, Ethan (U.S. patriot and soldier)
MAIN ARTICLE *volume 1 page 83, picture, volume 1 page 83*

MORE TO EXPLORE

Vermont *volume 14 page 69*

Allende, Salvador (president of Chile)
Chile *volume 3 page 99*

All-England Championship (tennis): *see in index* Wimbledon Championship

allergy

MAIN ARTICLE *volume 1 page 84*

MORE TO EXPLORE

asthma *volume 1 page 214*
immune system *volume 6 page 120*
sneezing *picture, volume 1 page 84*

All Hallows' Eve: *see in index* Halloween

Allied Powers (World War I alliance)
Italy *volume 6 page 174*
World War I *volume 15 page 61*

Allied Powers (World War II alliance)
Holocaust *volume 6 page 72*
World War II *volume 15 page 65*

Allies (World War I): *see in index* Allied Powers

Allies (World War II): *see in index* Allied Powers

alligator (reptile)
MAIN ARTICLE *volume 1 page 85, picture, volume 1 page 85*

MORE TO EXPLORE

crocodile *volume 3 page 220*
in algae *picture, volume 1 page 77*
in Everglades National Park *picture, volume 5 page 34*
nest *volume 9 page 37*
reptile *volume 11 page 51*
snout *picture, volume 1 page 85, picture, volume 3 page 221*
tail *volume 13 page 6*

alligator snapping turtle (reptile)
mimicry *volume 8 page 131*

allograft (surgery)
transplant *volume 13 page 91*

Allosaurus (dinosaur)
MAIN ARTICLE *volume 1 page 86*

MORE TO EXPLORE

dinosaurs in scale *picture, volume 4 page 53*
Saurischian dinosaurs *picture, volume 4 page 50*

alloy (metal mixture)
MAIN ARTICLE *volume 1 page 87, picture, volume 1 page 87*

MORE TO EXPLORE

metal *volume 8 page 106*

almond (tree and nut)
MAIN ARTICLE *volume 1 page 87, picture, volume 1 page 88*

Almoravids (Berber confederation)
Ghana Empire *volume 5 page 112*

Alodia (ancient kingdom, Nubia, Africa)
Nubia *volume 9 page 103*

aloha (Hawaiian word)
Hawaii *volume 6 page 26*

Aloha State (state in the U.S.): *see in index* Hawaii

Alomé (capital city of Togo): *see in index* Lomé

alphabet (writing)
MAIN ARTICLE *volume 1 page 88*

alphabetic writing (linguistics)
writing *volume 15 page 77*

Alpine skiing (sport)
skiing *volume 12 page 98*
types of skiing courses *picture, volume 12 page 98*

alpine tundra (geology)
tundra *volume 13 page 107*

Alps, The (mountain range in Europe)
MAIN ARTICLE *volume 1 page 89*

MORE TO EXPLORE

Austria *volume 1 page 233, picture, volume 1 page 233*
Europe *volume 4 page 160*
Matterhorn *picture, volume 1 page 90*
Slovenia *picture, volume 12 page 110*
Switzerland *volume 12 page 218*
Swiss village *picture, volume 12 page 218*

Alsatian (breed of dog): *see in index* German shepherd

Altai Mountains (mountain range in Asia)
Gobi desert *picture, volume 5 page 122*

altar (religion)
church *volume 3 page 117*
Roman Catholic church *picture, volume 3 page 112*

alternative energy
fossil fuel *volume 5 page 56*

al-Thani family (ruling family in Qatar)
Qatar *volume 11 page 4*

Althing (Icelandic government)
Iceland *volume 6 page 108*

aluminum (chemical element)
alloy *volume 1 page 87*

alveolus (anatomy)
lung *volume 7 page 184*
respiratory system *volume 11 page 55, picture, volume 11 page 55*

Alvin Ailey American Dance Theater (U.S. dance company)
Ailey *volume 1 page 50*
rehearsal for “Revelations” *picture, volume 1 page 50*

Alzheimer's disease
MAIN ARTICLE *volume 1 page 91*

AM (time): *see in index* ante meridiem

Amaterasu (Shinto deity)
Shinto *volume 12 page 81*

Amateur Athletic Union (U.S. sports organization)
swimming *volume 12 page 217*

amateurism
soccer *volume 12 page 118*

Amateur Softball Association of America (U.S. organization)
softball *volume 12 page 124*

amateur sports
sports *volume 12 page 168*

Amateur Swimming Association (British sports organization)
swimming *volume 12 page 217*

Amazonian manatee (mammal)
manatee *volume 8 page 39*

Amazon River (river in South America)
MAIN ARTICLE *volume 1 page 91*
MORE TO EXPLORE
Brazil *volume 2 page 125*
facts about South America *volume 12 page 143*
Peru *volume 10 page 64*
South America *volume 12 page 140*

amber (fossil resin)
MAIN ARTICLE *volume 1 page 92*, *picture, volume 1 page 92*
MORE TO EXPLORE
fossil *volume 5 page 55*
jewelry and gems *volume 7 page 24*

Ambo (people): *see in index* Ovambo

ambulance (specialized vehicle)
MAIN ARTICLE *volume 1 page 93*

ameba (protozoan order): *see in index* amoeba

amendment (change or addition to a law)
MAIN ARTICLE *volume 1 page 93*
MORE TO EXPLORE
United States Constitution *volume 14 page 32*

ament (flower cluster): *see in index* catkin

American alligator (reptile) *picture, volume 1 page 85*
alligator *volume 1 page 85*
snout *picture, volume 1 page 85*, *picture, volume 3 page 221*

American Anti-Slavery Society (U.S. history)
Mott *volume 8 page 193*

American badger (mammal) *picture, volume 2 page 6*
badgers *volume 2 page 5*

American Ballet Theatre (U.S. ballet company)
ballet *volume 2 page 15*

American bear (mammal): *see in index* black bear

American beaver (rodent)
beaver *volume 2 page 44*

American bison (mammal) *picture, volume 2 page 82*
bison *volume 2 page 82*
Hidatsa bison robe *picture, volume 6 page 52*
Kaw *volume 7 page 51*
Native Americans *volume 9 page 17*
Plains Indians
Assiniboin *volume 1 page 212*
Blackfoot *volume 2 page 85*
Sarcee *volume 12 page 37*

American chestnut (tree)
chestnut *volume 3 page 89*

American Civil War (U.S. history)
MAIN ARTICLE *volume 1 page 94*
MORE TO EXPLORE
background
abolitionist movement *volume 1 page 12*
African Americans *volume 1 page 43*
Buchanan *volume 2 page 138*
Missouri Compromise: *see in index* Missouri Compromise
Confederacy *volume 3 page 176*

people
Davis *volume 4 page 18*
Lee *volume 7 page 122*, *picture, volume 1 page 97*

places
Alabama *volume 1 page 61*
Atlanta *volume 1 page 220*
Florida *volume 5 page 36*
Georgia *volume 5 page 102*
Jackson *volume 7 page 4*
Louisiana *volume 7 page 181*
Mississippi *volume 8 page 142*
Montgomery *volume 8 page 176*
Nashville *volume 9 page 11*
North Carolina *volume 9 page 86*
Pennsylvania *volume 10 page 57*
Richmond *volume 11 page 64*
South Carolina *volume 12 page 148*

Tennessee *volume 13 page 44*
Virginia *volume 14 page 96*
events
Emancipation Proclamation *volume 4 page 130*
Fugitive Slave Acts *volume 5 page 74*
Harpers Ferry *volume 6 page 19*
Lee's surrender *picture, volume 1 page 98*
post-war Reconstruction: *see in index* Reconstruction
slavery *volume 12 page 107*
state government *volume 12 page 182*
Union
people
army officers *picture, volume 1 page 97*
Barton *volume 2 page 29*
Grant *volume 5 page 137*
Johnson *volume 7 page 27*
Lincoln *volume 7 page 155*
107th U.S. Colored Infantry *picture, volume 1 page 96*
Stowe *volume 12 page 195*
Tubman *volume 13 page 105*
places
Columbus *volume 3 page 161*
Delaware *volume 4 page 31*
Iowa *volume 6 page 146*
Kentucky *volume 7 page 57*
Maine *volume 8 page 23*
Maryland *volume 8 page 69*
Missouri *volume 8 page 147*
New York *volume 9 page 59*
United States *volume 14 page 29*
war *volume 15 page 9*

American colonies (British and U.S. history)
Albany Congress *volume 1 page 67*
Declaration of Independence *volume 4 page 23*
democracy *volume 4 page 35*
glass *volume 5 page 119*

American dog tick (arachnid) *picture, volume 13 page 63*

American eel (fish) *picture, volume 4 page 107*

American elk (mammal): *see in index* wapiti

American elm (tree) *picture, volume 4 page 128*
elm *volume 4 page 128*

American Federation of Labor (labor organization)
labor *volume 7 page 97*

American Football League (U.S. sports organization)
football *volume 5 page 50*

American Fur Company (historical U.S. company, 1808-47)
fur trade *volume 5 page 76*

American goldfinch (bird) *picture, volume 5 page 21*

American holly (plant) *picture, volume 6 page 70*

American Indian (indigenous peoples):
see in index Native American

American Indian Movement (U.S. civil rights organization)
Native Americans *volume 9 page 20*
Wounded Knee *volume 15 page 72, picture, volume 15 page 72*

American League (baseball organization)
baseball *volume 2 page 32*

American Library Association (U.S. organization)
children's literature awards *picture, volume 7 page 162*

American lobster (marine animal) *picture, volume 3 page 224*
crustacean *volume 3 page 225*

American Muslim Mission (U.S. religious organization): *see in index* Islam, Nation of

American Party (historical U.S. political party): *see in index* Know-Nothing party

American Red Cross (health organization)
Barton *volume 2 page 29*

American Revolution (U.S. history, 1775-83)

MAIN ARTICLE *volume 1 page 98*

MORE TO EXPLORE

Articles of Confederation *volume 1 page 195*

civil rights *volume 3 page 128*

Declaration of Independence *volume 4 page 24*

Enlightenment *volume 4 page 142*

George III *volume 5 page 99*

images and maps

Burgoyne surrenders at Saratoga *picture, volume 1 page 101*

Jones battles the "Serapis" *picture, volume 7 page 32*

Lexington, Battle of *picture, volume 1 page 98*

Molly Pitcher *picture, volume 1 page 102*

Washington at Valley Forge *picture, volume 1 page 101*

leaders

Adams, John *volume 1 page 23*

Adams, Samuel *volume 1 page 26*

Allen *volume 1 page 83*

Attucks *volume 1 page 226*

Franklin *volume 5 page 64*

Hamilton *volume 6 page 10*

Henry *volume 6 page 40*

Lafayette *volume 7 page 101*

Paine *volume 10 page 6*

Pulaski *volume 10 page 166*

Revere *volume 11 page 57*

Washington *volume 15 page 20*

Louis XVI *volume 7 page 179*

Native American involvement

Cayuga *volume 3 page 65*

Choctaw *volume 3 page 110*

Hiawatha *volume 6 page 49*

Iroquois *volume 6 page 160*

Mohawk *volume 8 page 152*

Mohican *volume 8 page 153*

Oneida *volume 9 page 137*

Onondaga *volume 9 page 138*

Seneca *volume 12 page 65*

Tecumseh *volume 13 page 30*

places

Massachusetts *volume 8 page 73*

New Hampshire *volume 9 page 48*

New Jersey *volume 9 page 50*

Trenton *volume 13 page 95*

New York *volume 9 page 59*

North Carolina *volume 9 page 86*

Pennsylvania *volume 10 page 56*

Rhode Island *volume 11 page 61*

Providence *volume 10 page 160*

South Carolina *volume 12 page 148*

United States *volume 14 page 28*

Virginia *volume 14 page 96*

Richmond *volume 11 page 64*

taxation *volume 13 page 21*

American robin (bird) *picture, volume 2 page 78, picture, volume 11 page 72*
robin *volume 11 page 72*

American Samoa (islands and U.S. territory in the Pacific Ocean)

Samoa *volume 12 page 24*

American Sign Language (form of communication)
sign language *volume 12 page 87*

American States, Organization of (Pan-American organization)
MAIN ARTICLE *volume 9 page 150*

American wayfaring tree
viburnum *volume 14 page 76*

Americas (continents)
discovery, exploration, and settlement
volume 1 page 102
Cabot *picture, volume 1 page 103*
Columbus *volume 3 page 162*
Coronado *volume 3 page 200*
empire *volume 4 page 132*
Verrazzano *volume 14 page 71*
pyramid *volume 10 page 171*
slavery *volume 12 page 106*

Amin, Idi (president of Uganda)
Uganda *volume 14 page 5*

Amish (U.S. religious group)
Amish family working on farm *picture, volume 10 page 56*
Pennsylvania *volume 10 page 55*

Amman (capital city of Jordan)
MAIN ARTICLE *volume 1 page 108, picture, volume 1 page 108*

MORE TO EXPLORE

Jordan *volume 7 page 33*

Ammonite (people)
Amman *volume 1 page 108*

amniotic sac (anatomy)
reproductive system *volume 11 page 49*

amoeba (protozoan order)
MAIN ARTICLE *volume 1 page 108*

Amon (Egyptian god)
ancient Egypt *volume 4 page 113*

Amon-Re (Egyptian god)
ancient Egypt *volume 4 page 113*

Amorite (people)
Mesopotamia *volume 8 page 104*

amphibian (animal class)
MAIN ARTICLE *volume 1 page 109*

MORE TO EXPLORE

animal *volume 1 page 125*

brain *volume 2 page 122, picture, volume 2 page 122*

ear *volume 4 page 88*

heart *volume 6 page 32*
 hibernation *volume 6 page 50*
 nose *volume 9 page 100*
 prehistoric life *volume 10 page 145*
 urinary systems of frogs and humans
picture, volume 14 page 41

amphitheater (type of building)
 architecture *volume 1 page 169*

Amritsar (city in India)
 Clock Tower and Golden Temple *picture, volume 6 page 124*

Amstel River (river in The Netherlands)
 Amsterdam *volume 1 page 111*

Amsterdam (capital city of The Netherlands)
 MAIN ARTICLE *volume 1 page 111, picture, volume 1 page 111*
 MORE TO EXPLORE
 Netherlands *volume 9 page 38*

Amundsen, Roald (Norwegian explorer)
 MAIN ARTICLE *volume 1 page 112, picture, volume 1 page 112*
 MORE TO EXPLORE
 Amundsen and crew members *picture, volume 9 page 94*
 Antarctica *volume 1 page 137*
 Northwest Passage *volume 9 page 93*
 polar exploration *volume 10 page 110*

anaconda (snake)
 MAIN ARTICLE *volume 1 page 113*

anaerobic exercise
 exercise *volume 4 page 172*

Anansi (folklore character) *picture, volume 5 page 42*

anaphylaxis (physiology)
 allergy *volume 1 page 84*

anarchism (political philosophy)
 terrorism *volume 13 page 49*

Anasazi (Native American people)
 MAIN ARTICLE *volume 1 page 114*
 MORE TO EXPLORE
 Cliff Palace *picture, volume 1 page 114, picture, volume 3 page 158*
 Colorado *volume 3 page 158*
 Hohokam culture *volume 6 page 70*
 Pueblo Indians *volume 10 page 164*

Anatolia (historical region in Asia): *see in index* Asia Minor

anatomy (biology)

MAIN ARTICLE *volume 1 page 115, picture, volume 1 page 115*

*For more about anatomy,
 look for these articles:*

BODY PARTS

Appendix

Arm

Blood

Bone

Brain

Cell

Ear

Exoskeleton

Eye

Foot

Hair

Hand

Heart

Hoof

Horn

Intestines

Kidney

Knee

Leg

Liver

Lung

Mouth

Muscle

Nail

Nose

Skin

Skull

Stomach

Teeth

Tongue

BODY SYSTEMS

Cardiovascular

System

Circulatory

System

Digestive

System

Endocrine

System

Immune System

Lymphatic

System

Nervous System

Reproductive

System

Respiratory

System

Skeletal System

Urinary System

“Anatomy Lesson of Dr. Nicolaes Tulp, The” (work by Rembrandt)
 Rembrandt *volume 11 page 44*

ANC (political party in South Africa): *see in index* African National Congress

Anchorage (city in Alaska, U.S.)
 Iditarod Race *picture, volume 6 page 113*

ancient Egypt: *see in index* Egypt, ancient

Andean condor (bird)
 Andes Mountains *volume 1 page 118*
 South America *volume 12 page 142*

Andean province (region in Antarctica):
see in index West Antarctica

Andersen, Hans Christian (Danish author)
 MAIN ARTICLE *volume 1 page 116*
 MORE TO EXPLORE
 Copenhagen *volume 3 page 195*
 folktale *volume 5 page 43*

“Little Mermaid, The” *picture, volume 1 page 128, picture, volume 3 page 196*
 “Ugly Duckling, The” *picture, volume 1 page 116*

Anderson, Marian (U.S. singer)
 MAIN ARTICLE *volume 1 page 116, picture, volume 1 page 117*

Andes Mountains (mountain range in South America)
 MAIN ARTICLE *volume 1 page 117*

MORE TO EXPLORE
 Amazon River *volume 1 page 91*
 Argentina *volume 1 page 175*
 Ecuador *volume 4 page 102*
 Mount Fitzroy *picture, volume 1 page 118*
 Peru *volume 10 page 64*
 farmland near Cuzco *picture, volume 10 page 65*
 Machu Picchu *volume 8 page 8*
 South America *volume 12 page 140*

Andorra (country in Europe)
 MAIN ARTICLE *volume 1 page 119*

Andorra la Vella (capital city of Andorra)
 MAIN ARTICLE *volume 1 page 120, picture, volume 1 page 120*
 MORE TO EXPLORE
 Andorra *volume 1 page 119*

Andrea del Verrocchio (Italian painter):
see in index Verrocchio, Andrea del

android
 robot *volume 11 page 75*

“And to Think That I Saw It on Mulberry Street” (work by Dr. Seuss)
 Dr. Seuss *volume 12 page 73*

anemia (blood disorder)
 malaria *volume 8 page 25*

anemone fish *picture, volume 5 page 28*

anesthetic (medical treatment)
 surgery *volume 12 page 207*

Aneto, Pico de (mountain in Spain)
 Pyrenees *volume 10 page 171*

Angel Falls (waterfall in Venezuela) *picture, volume 14 page 63*
 Venezuela *volume 14 page 63*
 waterfall *volume 15 page 24*

Angkor (ancient city in Cambodia)
 Angkor Wat *volume 1 page 120*

Angkor Wat (temple complex in Angkor, Cambodia)

MAIN ARTICLE *volume 1 page 120, picture, volume 1 page 121*

MORE TO EXPLORE

Cambodia *volume 3 page 18*

Angle (people)

Anglo-Saxon *volume 1 page 121*

angle (mathematics)

geometry *volume 5 page 98*

anglerfish

fish *volume 5 page 27*

Anglicanism (religion): *see in index*

England, Church of

angling (recreation): *see in index* fishing

Anglo-Boer War (British-South African history, 1899-1902): *see in index* Boer War

Anglo-Saxon (people)

MAIN ARTICLE *volume 1 page 121, picture, volume 1 page 121*

MORE TO EXPLORE

United Kingdom *volume 14 page 18*

Anglo-Saxon Chronicle

Alfred the Great *volume 1 page 76*

Angola (country in Africa)

MAIN ARTICLE *volume 1 page 122, picture, volume 1 page 122, picture, volume 1 page 123*

Angora goat (mammal) *picture, volume 5 page 121*

goat *volume 5 page 122*

angular momentum (physics)

gyroscope *volume 5 page 176*

animal (life form)

MAIN ARTICLE *volume 1 page 124*

MORE TO EXPLORE

adaptation *volume 1 page 26*

cave *volume 3 page 64*

extinction: *see in index* extinction

agriculture *volume 1 page 48*

anatomy and physiology

brain *volume 2 page 122*

cell *picture, volume 3 page 66*

circulatory system *volume 3 page 119*

ear *volume 4 page 87*

egg *volume 4 page 108*

enzyme *volume 4 page 144*

knee *picture, volume 7 page 73*

tail *volume 13 page 6*

biome *volume 2 page 73*

classification *picture, volume 7 page 168*

endangered species *volume 4 page 133*

living thing *volume 7 page 169, picture, volume 7 page 167*

migration *volume 8 page 125*

parasite *volume 10 page 33*

rain forest *volume 11 page 24*

seed *volume 12 page 63*

transportation *volume 13 page 92*

animal migration: *see in index* migration

animals, legendary

MAIN ARTICLE *volume 1 page 128*

animal skin

clothing *volume 3 page 141*

Torah *picture, volume 13 page 82*

animation (motion pictures)

MAIN ARTICLE *volume 1 page 129*

Anishinabe (Native American people): *see in index* Ojibwa

Anjou pear (fruit and tree) *picture, volume 10 page 47*

Ankara (capital city of Turkey)

MAIN ARTICLE *volume 1 page 131, picture, volume 1 page 131*

MORE TO EXPLORE

Turkey *volume 13 page 111*

Ankylosaurus (dinosaur): *see in index*

Euoplocephalus

Annapolis (state capital of Maryland, U.S.)

MAIN ARTICLE *volume 1 page 132, picture, volume 1 page 132*

MORE TO EXPLORE

Maryland *volume 8 page 68*

Anne Boleyn (queen of England)

Henry VIII *volume 6 page 39*

Anne of Cleves (queen of England)

Henry VIII *volume 6 page 39*

“Anne of Green Gables” (novel by

Montgomery)

literature for children *volume 7*

page 164

Prince Edward Island *volume 10*

page 150

“Annie Allen” (work by Brooks)

Brooks *volume 2 page 136*

anno Domini (division of time for dating events)

common abbreviations *table, volume 1 page 8*

anoa (mammal)

buffalo *volume 2 page 146*

anole (lizard)

chameleon *volume 3 page 79*

anorexia (medical disorder)

mental illness *volume 8 page 101*

ant (insect)

MAIN ARTICLE *volume 1 page 133, picture, volume 1 page 133, picture, volume 1 page 133*

MORE TO EXPLORE

insect *volume 6 page 139*

leg *picture, volume 7 page 123*

nest *volume 9 page 37*

Antananarivo (capital city of Madagascar)

MAIN ARTICLE *volume 1 page 134, picture, volume 1 page 134*

MORE TO EXPLORE

Madagascar *volume 8 page 9*

Antarctica (continent)

MAIN ARTICLE *volume 1 page 135*

MORE TO EXPLORE

glacier *volume 5 page 116*

ozone hole *picture, volume 9 page 160*

penguins *picture, volume 1 page 135*

polar exploration *volume 10 page 110*

Antarctic Circle

Cook *volume 3 page 193*

Antarctic Peninsula (peninsula of Antarctica)

Antarctica *volume 1 page 135*

Antarctic Treaty (1959)

Antarctica *volume 1 page 137*

polar exploration *volume 10 page 111*

ant bear (mammal): *see in index* armadillo

anteater (mammal)

MAIN ARTICLE *volume 1 page 138, picture, volume 1 page 138*

MORE TO EXPLORE

mouth *volume 8 page 197*

antelope (mammal)

MAIN ARTICLE *volume 1 page 138, picture, volume 1 page 139*

Antelope, Morris (Coeur d'Alene chief) *picture, volume 3 page 149*

For more about animals, look for these articles:

AMPHIBIANS

Amphibian
Frog
Salamander
Toad

ARTHROPODS

Ant
Bee
Beetle
Butterfly and Moth
Centipede and
Millipede
Cockroach
Cricket
Crustacean
Dragonfly
Firefly
Flea
Fly
Grasshopper
Insect
Krill
Locust
Mosquito
Scorpion
Spider
Termite
Tick and Mite
Walkingstick
Wasp

BIRDS

Albatross
Bird
Bird, Flightless
Bird of Prey
Blackbird
Bluebird
Canary
Cardinal
Chicken
Cowbird
Crow
Cuckoo
Duck
Eagle
Falcon
Finch
Flamingo
Goose
Gull

Hawk
Heron
Hummingbird
Ibis
Kingfisher
Loon
Magpie
Mockingbird
Nightingale
Ostrich
Owl
Parrot Family
Peacock
Pelican
Penguin
Pigeon
Poultry
Raven
Roadrunner
Robin
Songbird
Sparrow
Stork
Swan
Turkey
Vulture
Whippoorwill
Woodpecker

FISH

Barracuda
Bass
Carp
Catfish
Cod
Eel
Flying Fish
Goldfish
Lamprey
Ray
Salmon
Sea Horse
Shark
Swordfish
Trout
Tuna

MAMMALS

Aardvark
Anteater
Antelope
Ape

Armadillo
Badger
Bat
Bear
Beaver
Bison
Bonobo
Buffalo
Camel
Cat
Cattle
Cheetah
Chimpanzee
Chipmunk
Coyote
Deer
Dog
Dolphin
Donkey
Echidna
Elephant
Elk
Fox
Gerbil
Gibbon
Giraffe
Goat
Gorilla
Groundhog
Guinea Pig
Hamster
Hedgehog
Hippopotamus
Horse
Hyena
Jackal
Jaguar
Kangaroo
Koala
Llama
Lemming
Lemur
Leopard
Lion
Loris
Lynx
Manatee
Marsupial
Mink
Mole
Mongoose
Monkey

Moose
Mouse
Musk-ox
Muskrat
Ocelot
Opossum
Orangutan
Otter
Panda
Pig
Platypus
Porcupine
Porpoise
Prairie Dog
Primate
Puma
Rabbit and Hare
Raccoon
Rat
Reindeer
Rhinoceros
Rodent
Seal
Sheep
Shrew
Skunk
Sloth
Squirrel
Tapir
Tarsier
Tiger
Vole
Walrus
Wapiti
Weasel
Whale
Wolf
Wolverine
Yak
Zebra

MOLLUSKS

Bivalve
Mollusk
Octopus
Oyster
Snail and Slug
Squid

REPTILES

Alligator
Anaconda

Boa Constrictor
Chameleon
Cobra
Coral Snake
Crocodile
Dinosaur
Gecko
Iguana
Lizard
Python
Rattlesnake
Reptile
Sea Snake
Snake
Turtle
Viper

OTHER ANIMALS

Coral
Hydra
Jellyfish
Sea Anemone
Sponge
Starfish
Worm

OTHER ANIMAL

TOPICS

Adaptation
Aquarium
Disease, Animal
Ecosystem
Endangered Species
Exoskeleton
Feather
Food Chain
Fossil
Gestation
Habitat
Hibernation
Hoof
Horn
Metamorphosis
Migration, Animal
Mimicry
Nest
Pet
Protective Coloration
Shell
Tail
Zoo

ante meridiem (time)
common abbreviations *table, volume 1 page 8*

antenna (animal appendage)
ants *volume 1 page 133*
butterfly and moth *volume 2 page 158*
insect anatomy *picture, volume 6 page 138*

antenna (electronics)
dish antenna *picture, volume 11 page 18*
radar *volume 11 page 15, picture, volume 11 page 16*
telecommunication antennas *picture, volume 13 page 34*
television broadcasting *picture, volume 13 page 40*

Anthony, Susan B. (U.S. suffragist)
MAIN ARTICLE *volume 1 page 139, picture, volume 1 page 140*
MORE TO EXPLORE
Stanton *volume 12 page 178*

anthracite (mineral)
coal *volume 3 page 144*

anthrax (disease)
Pasteur *volume 10 page 41*

anthropology (science)
MAIN ARTICLE *volume 1 page 140, picture, volume 1 page 141*
MORE TO EXPLORE
culture *volume 3 page 230*

antibiotic (physiology)
MAIN ARTICLE *volume 1 page 142, picture, volume 1 page 142*
MORE TO EXPLORE
fungus *volume 5 page 76*
Lyme disease *volume 7 page 189*

antibiotic resistance
antibiotics *volume 1 page 142*

antibody (biochemical agent)
allergy *volume 1 page 84*
immune system *volume 6 page 119, picture, volume 6 page 119*
virus *volume 14 page 98*

Anti-Federalists (U.S. history)
Federalist papers *volume 5 page 9*

antigen (biochemistry)
immune system *volume 6 page 119, picture, volume 6 page 119*
lymphatic system *volume 7 page 190*

Antigonish (Nova Scotia, Canada)

children at Scottish festival *picture, volume 9 page 102*

Antigua and Barbuda (island country in the West Indies)
MAIN ARTICLE *volume 1 page 143*

Antigua Basilica of Guadalupe (church in Mexico City, Mexico) *picture, volume 8 page 114*

antihistamine (drug)
allergy *volume 1 page 85*
drug *volume 4 page 78*

anti-Semitism
Holocaust *volume 6 page 71*

antislavery movement (European and U.S. social movement): *see in index* abolitionist movement

antler (bone formation)
deer *volume 4 page 26, picture, volume 4 page 26*
horn *volume 6 page 85*
moose *picture, volume 8 page 181*
reindeer *volume 11 page 42, picture, volume 11 page 42*
wapiti *picture, volume 4 page 127*

Antony, Mark (Roman triumvir)
Cleopatra *volume 3 page 135*

anubis baboon (primate) *picture, volume 8 page 168*

anus (anatomy)
digestive system
grasshopper *picture, volume 4 page 48*
human *picture, volume 4 page 47*

anxiety disorder (mental disorder)
mental illness *volume 8 page 100*

Apache (Native American people)
MAIN ARTICLE *volume 1 page 144*
MORE TO EXPLORE
Cochise *volume 3 page 145*
Geronimo *volume 5 page 108*
images
cradleboard *picture, volume 1 page 144*
dolls *picture, volume 9 page 18*

apartheid (social policy)
MAIN ARTICLE *volume 1 page 144*
MORE TO EXPLORE
African National Congress *volume 1 page 46*
discrimination *volume 4 page 54*

Mandela *volume 8 page 40, picture, volume 8 page 41*
Namibia *volume 9 page 7*
South Africa *volume 12 page 139*
Tutu *volume 13 page 120*

Apatosaurus (dinosaur)
MAIN ARTICLE *volume 1 page 145*
MORE TO EXPLORE
dinosaur *picture, volume 4 page 53*

ape (primate)
MAIN ARTICLE *volume 1 page 146, picture, volume 1 page 147*
MORE TO EXPLORE
gibbon *picture, volume 5 page 113*
human origins *volume 6 page 94*
monkey *volume 8 page 166*
orangutan *picture, volume 1 page 148*

aphasia (loss of communication skills)
speech *volume 12 page 162*

Aphrodite (Greek goddess)
MAIN ARTICLE *volume 1 page 148*
MORE TO EXPLORE
Ares *volume 1 page 174*

Apia (capital city of Samoa)
MAIN ARTICLE *volume 1 page 149*
MORE TO EXPLORE
Samoa *volume 12 page 24*

Apo, Mount (volcano in the Philippines)
Philippines *volume 10 page 71*

Apocrypha (biblical text)
Bible *volume 2 page 67*

Apollo (Greek and Roman deity)
MAIN ARTICLE *volume 1 page 150*
MORE TO EXPLORE
Artemis *volume 1 page 191*
Delphi *volume 4 page 33*
Hermes *volume 6 page 47*
Midas *volume 8 page 122*
temple ruins *picture, volume 4 page 33*
Zeus *volume 15 page 104*

Apollo, Temple of (archaeological site in Delphi, Greece)
Apollo *volume 1 page 150*

Apollo program (U.S. space program)
Apollo 15 *picture, volume 4 page 175*
Armstrong *volume 1 page 189*
Moon *volume 8 page 180*

Apopsis (Egyptian mythology)
Re *volume 11 page 31, picture, volume 11 page 31*

Apostle (Christianity)

Jesus Christ *volume 7 page 22*

Appalachian Mountains (mountain range in North America)

MAIN ARTICLE *volume 1 page 151*

MORE TO EXPLORE

images

Blue Ridge *picture, volume 2 page 95*

Cumberland Gap *picture, volume 3 page 231*

Great Smoky Mountains *picture, volume 9 page 85*

Screw Auger Falls *picture, volume 1 page 151*

United States *volume 14 page 24*

New York *volume 9 page 57*

North Carolina *volume 9 page 85*

Rhode Island *volume 11 page 60*

West Virginia *volume 15 page 34*

Appalachian National Scenic Trail (hiking path in the U.S.)

Appalachian Mountains *volume 1 page 152*

“Appalachian Spring” (dance by Graham)

Graham *volume 5 page 134*

Graham dancing *picture, volume 5 page 134*

appendectomy (surgery)

appendix *volume 1 page 152*

appendicitis

appendix *volume 1 page 152*

appendix (anatomy)

MAIN ARTICLE *volume 1 page 152*

MORE TO EXPLORE

human digestive system *picture, volume 4 page 47*

lymphatic system *picture, volume 7 page 189*

apple (tree and fruit)

MAIN ARTICLE *volume 1 page 152, picture, volume 1 page 153, picture, volume 14 page 99*

MORE TO EXPLORE

fruit *picture, volume 5 page 72*

application software (computing)

computer *volume 3 page 173*

applied math (mathematics)

construction work *picture, volume 8 page 77*

mathematics *volume 8 page 77*

apricot (tree and fruit)

MAIN ARTICLE *volume 1 page 153, picture, volume 1 page 153*

aquaculture (horticulture)

seaweed *picture, volume 7 page 71*

aquarium

MAIN ARTICLE *volume 1 page 154, picture, volume 1 page 154*

Aquarius (astronomy)

constellation *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

aqueduct (system for carrying water)

MAIN ARTICLE *volume 1 page 155, picture, volume 1 page 155*

Aquino, Corazon (president of the Philippines)

Philippines *volume 10 page 72*

Arab (Arabic-speaking peoples)

MAIN ARTICLE *volume 1 page 159*

MORE TO EXPLORE

history

empire *volume 4 page 132*

Iran *volume 6 page 149*

Muhammad *volume 8 page 203*

Palestine *volume 10 page 18*

Sudan *volume 12 page 199*

people and culture

Arabian Peninsula *volume 1 page 157*

Bahrain *volume 2 page 9*

Iraq *volume 6 page 152*

Morocco *volume 8 page 183*

street market in Cairo *picture, volume 1 page 159*

Syria *volume 12 page 223*

Tanzania *volume 13 page 16*

science and technology

abacus *volume 1 page 7*

numbers and number systems *volume 9 page 107*

arabesque (ballet position)

ballet *volume 2 page 13*

Arabia (region in southwestern Asia): *see in index* Arabian Peninsula**Arabian camel** (mammal): *see in index* dromedary**Arabian Desert** (desert in the Arabian Peninsula)

Arabian Peninsula *volume 1 page 156, picture, volume 1 page 157*

“Arabian Nights” (Middle Eastern tales)

folktale *volume 5 page 41*

literature *volume 7 page 161*

Arabian Peninsula (region in southwestern Asia)

MAIN ARTICLE *volume 1 page 156*

Arabic alphabet

alphabet *volume 1 page 89*

calligraphy *volume 3 page 15*

Arabic number system: *see in index* base-ten number system**Arabic numeral**

Khwarizmi *volume 7 page 62*

Arab-Israeli Wars

MAIN ARTICLE *volume 1 page 157*

MORE TO EXPLORE

Israel *volume 6 page 169*

Jordan *volume 7 page 34*

Arab League

Egypt *volume 4 page 111*

Arab Republic of Egypt (country in the Middle East): *see in index* Egypt**arachnid** (arthropod class): *see in index* scorpion; spider; tick**Arafat, Yasir** (Palestinian leader)

Palestine Liberation Organization *volume 10 page 19*

signing peace agreement *picture, volume 10 page 19*

Aragats, Mount (mountain in Armenia)

Armenia *volume 1 page 184*

Aral Sea (sea in Central Asia)

MAIN ARTICLE *volume 1 page 160*

Aramaic alphabet

alphabet *volume 1 page 89*

Aranyakas (Hindu literature)

Veda *volume 14 page 60*

Arapaho (Native American people)

MAIN ARTICLE *volume 1 page 161*

MORE TO EXPLORE

Arapaho traditional clothing *picture, volume 1 page 161*

Custer *volume 3 page 233*

Gros Ventre *volume 5 page 163*

Wyoming *volume 15 page 80*

Ararat, Mount (mountain in Turkey)

Khor Virap monastery *picture, volume 1 page 184*

Araucanian (Native American people)Chile *volume 3 page 99***Arawak** (Native American people)MAIN ARTICLE *volume 1 page 161*

MORE TO EXPLORE

Bahamas *volume 2 page 8*Barbados *volume 2 page 27*Carib *volume 3 page 40*Haiti *volume 6 page 9*Jamaica *volume 7 page 10*Puerto Rico *volume 10 page 165*stone carving *picture, volume 1 page 161***Arbor Day** (United States holiday)MAIN ARTICLE *volume 1 page 162, picture, volume 1 page 162***arboreal locomotion** (animal behavior)sloth *volume 12 page 108***Arc de Triomphe** (arch in Paris, France)Bastille Day parade *picture, volume 2 page 38***arch** (architecture)architecture *volume 1 page 167***archaeology** (science)MAIN ARTICLE *volume 1 page 163*

MORE TO EXPLORE

ancient tomb in China *picture, volume 1 page 163*anthropology *volume 1 page 142*excavation in Peru *picture, volume 1 page 164*history *volume 6 page 64*origins *volume 10 page 121*paleontology *volume 10 page 17***Archaeopteryx** (prehistoric bird)MAIN ARTICLE *volume 1 page 164*

MORE TO EXPLORE

dinosaur *volume 4 page 51, picture, volume 4 page 53***arch bridge** (transportation structure)bridge *volume 2 page 130, picture, volume 2 page 130*Prague *picture, volume 10 page 142***archery**MAIN ARTICLE *volume 1 page 165, picture, volume 1 page 165, picture, volume 1 page 166***archipelago** (geology)Fiji *picture, volume 5 page 19*island *volume 6 page 167***architecture**MAIN ARTICLE *volume 1 page 167*

MORE TO EXPLORE

ancient Rome *volume 11 page 88*MARTa Museum in Herford, Germany *picture, volume 1 page 172***arctic climate:** *see in index* polar climate**Arctic fox** (mammal)fox *volume 5 page 57***Arctic islands** (islands in Canada)Northwest Passage *volume 9 page 93***Arctic Ocean**MAIN ARTICLE *volume 1 page 172, picture, volume 1 page 173*

MORE TO EXPLORE

ocean *volume 9 page 117*polar exploration *volume 10 page 110***Arctic peoples:** *see in index* Aleut;

Eskimo; Sami

Arctic regions

exploration

Amundsen *volume 1 page 113*Peary *volume 10 page 48*polar bear *picture, volume 2 page 42***Arctic tern** (bird)animal migration *volume 8 page 125***Arctic tundra**tundra *volume 13 page 107***Ardennes** (region in Western Europe)*picture, volume 2 page 54***Ardennes, Battle of the** (World War II):*see in index* Bulge, Battle of the**arena stage** (theater)theater *volume 13 page 57***Arequipa** (town in Peru)town plaza *picture, volume 10 page 65***Ares** (Greek god)MAIN ARTICLE *volume 1 page 174*

MORE TO EXPLORE

Athena *volume 1 page 218*Hera *volume 6 page 43***“Are You There God? It’s Me, Margaret”** (work by Blume)Blume *volume 2 page 96***Argall, Samuel** (English sea captain)Delaware *volume 4 page 30***Argentina** (country in South America)MAIN ARTICLE *volume 1 page 175*

MORE TO EXPLORE

Falkland Islands *volume 5 page 6*Patagonia *picture, volume 1 page 118, picture, volume 1 page 175*gauchos *picture, volume 3 page 61*Tierra del Fuego *volume 13 page 64***aria** (solo song)opera *volume 9 page 141***Arias Dávila, Pedro** (Spanish soldier and colonial administrator): *see in index*

Dávila, Pedro Arias

Ariel (moon of Uranus)Uranus *volume 14 page 39***Aries** (astronomy)constellation *volume 3 page 188*zodiac signs *picture, volume 15 page 107***Arikara** (Native American people)MAIN ARTICLE *volume 1 page 177*

MORE TO EXPLORE

Arikara ceremony *picture, volume 1 page 177*Hidatsa *volume 6 page 53*Mandan *volume 8 page 40*Pierre *volume 10 page 82***Aristide, Jean-Bertrand** (president of Haiti)Haiti *volume 6 page 9***Aristotle** (ancient Greek philosopher)Alexander the Great *volume 1 page 73*imagined meeting of philosophers by Raphael *picture, volume 10 page 73***arithmetic** (mathematics)MAIN ARTICLE *volume 1 page 177*

MORE TO EXPLORE

mathematics *volume 8 page 77***Arizona** (state in the U.S.)MAIN ARTICLE *volume 1 page 178*

MORE TO EXPLORE

geography

Grand Canyon *picture, volume 4 page 93*Marble Canyon and Colorado River *picture, volume 3 page 159*Tonto National Forest *picture, volume 10 page 75*Hohokam culture *volume 6 page 69, picture, volume 1 page 179*telecommunication antennas *picture, volume 13 page 34***ark** (Judaism) *picture, volume 12 page 222*

Arkansas (Native American people): *see in index* Quapaw

Arkansas (state in the U.S.)

MAIN ARTICLE *volume 1 page 180*, *picture, volume 1 page 180*

MORE TO EXPLORE

geography

State Capitol *picture, volume 5 page 132*

William J. Clinton Presidential Library *picture, volume 7 page 166*

history

Clinton *volume 3 page 139*

desegregation of schools *picture, volume 1 page 181*

Eisenhower *volume 4 page 118*

rice crop *picture, volume 1 page 181*

Arkansas River (river in the U.S.)

near Wichita, Kansas *picture, volume 7 page 48*

ark of the Law (Judaism): *see in index* ark

Arles (France)

Van Gogh *volume 14 page 56*

Arlington National Cemetery (cemetery in Virginia, U.S.)

grave markers *picture, volume 4 page 22*

arm (anatomy)

MAIN ARTICLE *volume 1 page 182*, *picture, volume 1 page 182*

MORE TO EXPLORE

bone *picture, volume 2 page 106*

skeletal muscles *picture, volume 8 page 208*

Armada, Spanish (Spanish naval fleet)

MAIN ARTICLE *volume 1 page 183*

MORE TO EXPLORE

Drake *volume 4 page 70*

Elizabeth I *volume 4 page 126*

armadillo (mammal)

MAIN ARTICLE *volume 1 page 183*, *picture, volume 1 page 183*

armed forces

Memorial Day *volume 8 page 97*

submarine *volume 12 page 196*

armed martial arts

martial arts *volume 8 page 64*

Armenia (country in Asia)

MAIN ARTICLE *volume 1 page 184*

MORE TO EXPLORE

geography

monument in Yerevan *picture, volume 1 page 185*

Mount Ararat and Khor Virap monastery *picture, volume 1 page 184*

Armenian Apostolic church

Armenia *volume 1 page 185*

Armistice (European-U.S. history)

World War I *volume 15 page 65*

Armistice Day (holiday): *see in index*

Veterans Day

armor (protective clothing)

MAIN ARTICLE *volume 1 page 186*

MORE TO EXPLORE

ancient warriors *picture, volume 15 page 9*

European armor *picture, volume 1 page 186*

armor-piercing bomb (military technology)

bomb *volume 2 page 104*

Armstrong, Lance (U.S. cyclist)

MAIN ARTICLE *volume 1 page 187*, *picture, volume 1 page 187*

Armstrong, Louis (U.S. musician)

MAIN ARTICLE *volume 1 page 188*, *picture, volume 1 page 188*

MORE TO EXPLORE

jazz *volume 7 page 16*

Armstrong, Neil (U.S. astronaut)

MAIN ARTICLE *volume 1 page 188*, *picture, volume 1 page 189*

MORE TO EXPLORE

exploration *volume 4 page 174*

Moon *volume 8 page 180*

space exploration *volume 12 page 152*

army (military force)

MAIN ARTICLE *volume 1 page 189*, *picture, volume 1 page 189*

MORE TO EXPLORE

Spanish-American War *picture, volume 12 page 157*

Army, United States (U.S. military): *see in index* United States Army, The

“Around the World in Eighty Days”

(book by Verne)

Verne *volume 14 page 70*

ARPANET (U.S. computer network): *see in index* Advanced Research Projects

Agency Network

arrow: *see in index* bow and arrow

arroyo (dry streambed): *see in index* wadi

art

Renaissance *volume 11 page 46*

Artemis (Greek goddess)

MAIN ARTICLE *volume 1 page 190*

arteriole (anatomy)

cardiovascular system *volume 3 page 39*

arteriosclerosis (disease)

cardiovascular system *volume 3 page 40*

artery (anatomy)

cardiovascular system *volume 3 page 38*, *picture, volume 3 page 38*

art exhibit (art show)

art show poster *picture, volume 9 page 44*

arthritis (bone and joint disease)

MAIN ARTICLE *volume 1 page 191*, *picture, volume 1 page 191*

arthropod (animal)

animal *volume 1 page 125*

invertebrates *volume 6 page 144*

leg *volume 7 page 124*

prehistoric life *volume 10 page 145*

Arthur (legendary king of Britain)

Arthurian legend *volume 1 page 193*

Arthur, Chester A. (president of the U.S.)

MAIN ARTICLE *volume 1 page 191*, *picture, volume 1 page 192*

MORE TO EXPLORE

timeline *volume 1 page 191*

Arthurian legend

MAIN ARTICLE *volume 1 page 193*, *picture, volume 1 page 193*

Articles of Confederation (U.S. history, 1781-89)

MAIN ARTICLE *volume 1 page 194*, *picture, volume 1 page 194*

MORE TO EXPLORE

Continental Congress *volume 3 page 192*

state government *volume 12 page 181*

United States Constitution *volume 14 page 32*

artifact (archaeology)

archaeology *volume 1 page 163*

artificial fiber

fibers *volume 5 page 16, picture, volume 5 page 17, picture, volume 13 page 28*

textile *volume 13 page 53*

artificial gem (chemical compound): *see*

in index synthetic gem

artificial hip joint *picture, volume 13*

page 91

artificial intelligence

MAIN ARTICLE *volume 1 page 195* rillery

war *volume 15 page 10*

artistic gymnastics

gymnastics *volume 5 page 174*

art museum

museum *volume 8 page 211, picture, volume 8 page 211*

arts, the

MAIN ARTICLE *volume 1 page 196*

MORE TO EXPLORE

communication *volume 3 page 167*

Hermitage *picture, volume 1 page 196*

*For more about the arts,
look for these articles:*

Animation	Literature
Architecture	Music
Ballet	Musical
Book and	Instrument
Bookmaking	Opera
Calligraphy	Painting
Dance	Pottery
Decorative Arts	Sculpture
Drama	Theater
Drawing	

Arts and Crafts movement

decorative arts *volume 4 page 25*

Morris wallpaper *picture, volume 4 page 26*

art therapy (medicine and psychology)

mental illness treatment *picture, volume 8 page 101*

Aruba (island in the Caribbean Sea)

Netherlands *volume 9 page 38*

Aryan (ancient Asian people)

Asia *volume 1 page 204*

Hinduism *volume 6 page 57*

India *volume 6 page 124*

Indus Valley *volume 6 page 136*

Iran *volume 6 page 148*

asana (Yoga position)

Yoga *volume 15 page 93*

Asante (people): *see in index* Ashanti**Asante** (historical kingdom in Africa): *see in index* Ashanti**ASAP** (abbreviated phrase)

abbreviation *volume 1 page 8*

asexual reproduction (biology)

reproductive system *volume 11 page 47*

ash (tree)

MAIN ARTICLE *volume 1 page 196, picture, volume 1 page 197*

ash (volcanic material): *see in index* volcanic ash**Ashanti** (people)

Ghana *volume 5 page 111*

Ashanti (historical kingdom in Africa)

MAIN ARTICLE *volume 1 page 197, picture, volume 1 page 197*

Ashe, Arthur (U.S. tennis player)

MAIN ARTICLE *volume 1 page 198, picture, volume 1 page 198*

Ashgabat (capital city of Turkmenistan)

MAIN ARTICLE *volume 1 page 199*

MORE TO EXPLORE

monument in downtown Ashgabat *picture, volume 1 page 199*

Turkmenistan *volume 13 page 115*

Ashoka (emperor of India): *see in index*

Asoka

Ashur (ancient city in Iraq): *see in index*

Assur

Asia (continent)

MAIN ARTICLE *volume 1 page 200*

MORE TO EXPLORE

geography
mountains

Himalayas *volume 6 page 54, picture, volume 9 page 31*

Karakoram Range *picture, volume 7 page 50*

Mount Everest *volume 4 page 167, picture, volume 4 page 167*

Pamir Mountains *picture, volume 13 page 10*

Tian Shan *picture, volume 1 page 202*

rivers, lakes, and seas

Aral Sea: *see in index* Aral Sea

*For more about Asia, look for
articles on these countries:*

Afghanistan	Lebanon
Armenia	Malaysia
Azerbaijan	Maldives
Bahrain	Mongolia
Bangladesh	Myanmar
Bhutan	Nepal
Brunei	Oman
Cambodia	Pakistan
China	Philippines
East Timor	Qatar
Georgia	Russia
India	Saudi Arabia
Indonesia	Singapore
Iran	Sri Lanka
Iraq	Syria
Israel	Tajikistan
Japan	Thailand
Jordan	Turkey
Kazakhstan	Turkmenistan
Korea, North	United Arab
Korea, South	Emirates
Kuwait	Uzbekistan
Kyrgyzstan	Vietnam
Laos	Yemen

Belaya River *picture, volume 14 page 38*

Caspian Sea: *see in index* Caspian Sea

Euphrates River *volume 4 page 159*

Ganges *volume 5 page 86*

Mekong River *volume 8 page 96, picture, volume 8 page 96*

Yangtze *picture, volume 15 page 87*

people and culture

Kiyomizu Temple *picture, volume 1 page 203*

refugee *picture, volume 11 page 39*

SARS *picture, volume 4 page 146*

traditional dress *picture, volume 7 page 52, picture, volume 7 page 83*

science and technology

brass *volume 2 page 123*

Asia Minor (historical region in Asia)

MAIN ARTICLE *volume 1 page 206*

MORE TO EXPLORE

technology and invention *volume 13 page 25*

Turkey *volume 13 page 111*

Asian American (people)

MAIN ARTICLE *volume 1 page 206*, *picture, volume 1 page 207*, *picture, volume 1 page 207*

Asian camel (mammal): *see in index* Bactrian camel

Asian elephant (mammal) *picture, volume 4 page 124*
elephant *volume 4 page 123*

Asian water buffalo (mammal): *see in index* water buffalo

Asiatic black bear (mammal)
bear *volume 2 page 41*

Asiatic chipmunk (mammal)
chipmunk *volume 3 page 106*

aside (dramatic device)
drama *volume 4 page 72*

Asimov, Isaac (U.S. author)
science fiction *volume 12 page 51*

ASL (form of communication): *see in index* American Sign Language

Asmara (capital city of Eritrea)
MAIN ARTICLE *volume 1 page 209*
MORE TO EXPLORE

Eritrea *volume 4 page 151*

Asoka (emperor of India)
Buddhism *volume 2 page 145*
Mauryan Empire *volume 8 page 81*

asparagus (plant and food)
MAIN ARTICLE *volume 1 page 209*, *picture, volume 1 page 209*

aspartame (sugar substitute)
sugar *volume 12 page 202*

aspen (tree)
MAIN ARTICLE *volume 1 page 210*, *picture, volume 1 page 210*
MORE TO EXPLORE
poplar *volume 10 page 126*

asphalt
road *volume 11 page 70*

aspirin (drug)
chicken pox *volume 3 page 95*
Reye's syndrome *volume 11 page 58*

ass (animal)
donkey *volume 4 page 67*

As-Sa'id (region of the Nile Valley in Africa): *see in index* Upper Egypt

Assassin (Islamic group)
assassination *volume 1 page 211*

assassination (murder of a public figure)
MAIN ARTICLE *volume 1 page 210*

assemblage (art)
sculpture *volume 12 page 56*

Assemblée Nationale (historical French parliament): *see in index* National Assembly

assembly line (industry) *picture, volume 8 page 46*
automobile *volume 1 page 237*
technology and invention *volume 13 page 28*

Assiniboin (Native American people)
MAIN ARTICLE *volume 1 page 211*, *picture, volume 1 page 211*

MORE TO EXPLORE
Manitoba *volume 8 page 44*
Saskatchewan *volume 12 page 39*

association football (soccer): *see in index* soccer

Assur (ancient city in Iraq)
Tigris River *volume 13 page 66*

Assyria (ancient Middle Eastern empire)
aqueduct *volume 1 page 156*
Mesopotamia *volume 8 page 104*

Astana (capital city of Kazakhstan)
MAIN ARTICLE *volume 1 page 212*
MORE TO EXPLORE

Kazakhstan *volume 7 page 52*

asteroid (astronomy)
MAIN ARTICLE *volume 1 page 212*, *picture, volume 1 page 213*

MORE TO EXPLORE
solar system *volume 12 page 128*

asteroid belt (astronomy)
asteroid *volume 1 page 213*
solar system *picture, volume 12 page 127*

asthma (breathing disorder)
MAIN ARTICLE *volume 1 page 213*, *picture, volume 1 page 213*

Astley, Philip (English circus manager)
circus *volume 3 page 120*

astrology
zodiac *volume 15 page 107*

astronaut (space explorer)
Moon exploration *picture, volume 4 page 175*
space exploration *volume 12 page 151*
solar flare *picture, volume 12 page 203*

astronomer
map and globe *picture, volume 8 page 49*

astronomical observatory
telescope *volume 13 page 39*

astronomical unit (measurement)
solar system *picture, volume 12 page 127*

astronomy (science)
MAIN ARTICLE *volume 1 page 214*

MORE TO EXPLORE

Earth *picture, volume 4 page 90*
Jupiter *picture, volume 7 page 41*
solar flare *picture, volume 12 page 203*
Uranus *picture, volume 14 page 39*
Venus *picture, volume 14 page 66*

*For more about astronomy,
look for these articles:*

Asteroid	Milky Way
Aurora	Moon
Black Hole	Nebula
Comet	Planet
Constellation	Satellite
Eclipse	Solar System
Galaxy	Star
Meteor and Meteorite	Sun
	Universe

Asunción (capital city of Paraguay)
MAIN ARTICLE *volume 1 page 216*
MORE TO EXPLORE

Paraguay *volume 10 page 30*
presidential palace *picture, volume 1 page 216*

Aswan High Dam (dam in Egypt)
Nile River *volume 9 page 73*

asylum (law)
refugee *volume 11 page 40*

Atacama Desert (desert in Chile)
desert near Laguna Miscanti *picture, volume 3 page 99*
rain *volume 11 page 22*

Atari Corporation (U.S. electronic company)
electronic games *volume 4 page 122*

Atatürk, Kemal (president of Turkey)
Ankara *volume 1 page 132*

Mausoleum *picture, volume 1*
page 131

Turkey *volume 13 page 113*

Athbara River (river in Africa)

Nile River *volume 9 page 72*

Athapaskan (Native American people)

MAIN ARTICLE *volume 1 page 216*

MORE TO EXPLORE

Athapaskan child *picture, volume 1*
page 216

Northwest Territories *volume 9 page 95*

Yukon *volume 15 page 97*

Atharvaveda (Hindu literature)

Veda *volume 14 page 60*

Athena (Greek goddess)

MAIN ARTICLE *volume 1 page 217*

MORE TO EXPLORE

Athens *volume 1 page 218*

Perseus *volume 10 page 60*

Zeus *volume 15 page 104*

Athens (capital city of Greece)

MAIN ARTICLE *volume 1 page 218, picture,*
volume 1 page 218

MORE TO EXPLORE

Acropolis *volume 1 page 19*

ancient Greece *volume 5 page 154*

Athena *volume 1 page 218*

city-state *volume 3 page 126*

Greece *volume 5 page 151*

Persian Wars *volume 10 page 63*

athlete: *see in index* sports

athletics (sports): *see in index* track and
field

Atlanta (state capital of Georgia, U.S.)

MAIN ARTICLE *volume 1 page 219*

MORE TO EXPLORE

Centennial Olympic Park *picture, vol-*
ume 1 page 219

Georgia *volume 5 page 101*

Atlanta Braves (baseball team)

Aaron *volume 1 page 7*

Atlantic cod (fish)

cod *volume 3 page 147*

Atlantic manta (fish)

ray *volume 11 page 30*

Atlantic Migration (international his-
tory)

human migration *volume 8*
page 128

Atlantic Ocean

MAIN ARTICLE *volume 1 page 220, picture,*
volume 1 page 221

MORE TO EXPLORE

“Mayflower” *picture, volume 8 page 83*

ocean *volume 9 page 117*

volcano *volume 14 page 100*

Atlantic puffin (bird) *picture, volume 4*
page 36

Atlantic salmon (fish)

salmon *volume 12 page 22*

Atlas (Greek mythology)

MAIN ARTICLE *volume 1 page 222*

MORE TO EXPLORE

atlas *volume 1 page 223*

Titans *volume 13 page 71*

atlas (collection of maps)

MAIN ARTICLE *volume 1 page 223, picture,*
volume 1 page 223

atlas (vertebra)

skull *volume 12 page 103*

atman (Hindu philosophy)

Hinduism *volume 6 page 56*

atmosphere (gaseous envelope)

MAIN ARTICLE *volume 1 page 223*

MORE TO EXPLORE

aurora *volume 1 page 228*

Earth *volume 4 page 89*

environment *volume 4 page 143*

sun *volume 12 page 203*

water *volume 15 page 23*

atmospheric pressure

vacuum *volume 14 page 50*

weather *volume 15 page 27*

atoll (reef and landform): *see in index*
coral atoll

atom (matter)

MAIN ARTICLE *volume 1 page 224*

MORE TO EXPLORE

chemical element *volume 3 page 86*

chemistry *volume 3 page 87*

components *picture, volume 1 page 225*

crystal *volume 3 page 226*

electricity *volume 4 page 120*

molecule *volume 8 page 155*

nuclear energy *volume 9 page 103*

radiation *volume 11 page 16*

atom bomb (fission device): *see in index*
atomic bomb

atomic bomb (fission device)

bomb *volume 2 page 104*

Hiroshima *volume 6 page 60*

Japan *volume 7 page 15*

mushroom cloud *picture, volume 2*
page 105

New Mexico *volume 9 page 52*

Truman *volume 13 page 101*

war *volume 15 page 10*

weapon *volume 15 page 26*

World War II *volume 15 page 70*

Atomic Bomb Dome (building in
Hiroshima, Japan)

Hiroshima *volume 6 page 60*

atomic clock (instrument)

clock *volume 3 page 141*

atomic energy (physics): *see in index*
nuclear energy

atomic nucleus (physics)

atom *volume 1 page 224, picture, vol-*
ume 1 page 225

nuclear energy *volume 9 page 103*

radiation *volume 11 page 17*

atomic number (physics)

atom *volume 1 page 225*

chemical element *volume 3 page 86*

atomic weight (chemistry and physics)

atom *volume 1 page 225*

Atonement, Day of (Judaism): *see in*
index Yom Kippur

atrium (heart anatomy)

cardiovascular system *volume 3 page 38*

heart *volume 6 page 31*

human heart *picture, volume 6 page 31*

Atsina (Native American people): *see in*
index Gros Ventre

attack aircraft

air force *volume 1 page 52*

attention-deficit/hyperactivity disorder
(medical disorder)

mental illness *volume 8 page 101*

Attila (king of the Huns)

Attila the Hun with his warriors *picture,*
volume 6 page 99

Huns *volume 6 page 99*

attitude (ballet position)

ballet *volume 2 page 14*

Attiwandaron (Native American people)

Ontario *volume 9 page 140*

Attucks, Crispus (American hero)

MAIN ARTICLE *volume 1 page 225*, *picture, volume 1 page 226*

MORE TO EXPLORE

American Revolution *volume 1 page 99*

auditory signal (electronics)

television *volume 13 page 40*

auditory tube (anatomy): *see in index*

eustachian tube

Augusta (state capital of Maine, U.S.)

MAIN ARTICLE *volume 1 page 226*, *picture, volume 1 page 226*

MORE TO EXPLORE

Maine *volume 8 page 22*

Augusta National Golf Club (U.S. organization)

water hazard *picture, volume 5 page 126*

Augustus (Roman emperor)

MAIN ARTICLE *volume 1 page 227*

MORE TO EXPLORE

ancient Rome *volume 11 page 90*

Cleopatra *volume 3 page 135*

Aurangzeb (Mughal emperor)

Mughal Empire *volume 8 page 202*

auricle (anatomy of the ear)

bat's ear *picture, volume 4 page 87*

ear *volume 4 page 87*, *picture, volume 4 page 87*

aurora (atmospheric phenomenon)

MAIN ARTICLE *volume 1 page 227*

MORE TO EXPLORE

aurora over northern Canada *picture, volume 1 page 227*

solar system *volume 12 page 127*

sun *volume 12 page 203*

aurora australis (atmospheric phenomenon)

auroras *volume 1 page 228*

aurora borealis (atmospheric phenomenon)

auroras *volume 1 page 227*

Austin (state capital of Texas, U.S.)

MAIN ARTICLE *volume 1 page 228*

Australasia (region, Oceania)

Oceania *volume 9 page 119*

Australia (island continent and nation)

MAIN ARTICLE *volume 1 page 229*

MORE TO EXPLORE

geography

Great Barrier Reef *volume 5 page 145*

sea stacks *picture, volume 14 page 78*

Uluru/Ayers Rock *picture, volume 1 page 13*

Wave Rock *picture, volume 11 page 75*

history

Cook *volume 3 page 193*

gold rush *volume 5 page 123*

Nauru *volume 9 page 22*

Port Arthur *picture, volume 13 page 20*

timeline *volume 1 page 229*

people and culture

Australian Aborigine *volume 1 page 13*

boomerang *volume 2 page 110*

national anthem *volume 9 page 13*

wildlife

echidna *picture, volume 4 page 97*

frilled lizard *picture, volume 7 page 170*

kangaroo *picture, volume 7 page 46*

koala *picture, volume 7 page 76*

marsupial *picture, volume 8 page 63*

Australian Aborigine (people)

aboriginal peoples *volume 1 page 13*

Australia *volume 1 page 230*

Aboriginal artist *picture, volume 9 page 91*

Northern Territory *volume 9 page 91*

Queensland *volume 11 page 11*

South Australia *volume 12 page 145*

Sydney *volume 12 page 221*

Uluru/Ayers Rock *picture, volume 1 page 13*

Victoria *volume 14 page 78*

Western Australia *volume 15 page 31*

boomerang *volume 2 page 110*

Australian Alps (mountain range in Australia)

Australia *volume 1 page 229*

Australian Capital Territory (territory of Australia)

New South Wales *volume 9 page 53*

"Australian Legendary Tales" (work by Parker)

literature for children *volume 7*

page 164

Australian Open (tennis)

Ashe *volume 1 page 199*

Williams sisters *volume 15 page 45*

australopithecine (paleontology)

foot prints *picture, volume 6 page 95*

human lineage *picture, volume 6 page 93*

human origins *volume 6 page 95*

Australopithecus afarensis (hominid)

human lineage *picture, volume 6 page 93*

skull comparison with other hominids *picture, volume 6 page 95*

Austria (country in Europe)

MAIN ARTICLE *volume 1 page 233*

MORE TO EXPLORE

geography

Alps *picture, volume 1 page 233*

Salzburg *picture, volume 1 page 234*

history

Hapsburgs *volume 6 page 15*

Poland *volume 10 page 108*

Austria-Hungary (historic empire in Europe, 1867-1918)

Czechoslovakia *volume 3 page 238*

Czech Republic *volume 3 page 240*

Hapsburgs *volume 6 page 16*

Hungary *volume 6 page 102*

World War I *volume 15 page 61*

Yugoslavia *volume 15 page 95*

autograft (surgery)

transplant *volume 13 page 91*

autoimmune disease

immune system *volume 6 page 120*

automated teller machine (banking)

automated teller machine in Shanghai, China *picture, volume 2 page 25*

automaton

robot *volume 11 page 74*

automobile

MAIN ARTICLE *volume 1 page 235*

MORE TO EXPLORE

images

city transportation *picture, volume 13 page 92*

early car *picture, volume 1 page 236*

flood *picture, volume 5 page 33*

hybrid car *picture, volume 1 page 237*

parts *picture, volume 1 page 235*

Michigan *volume 8 page 117*

technology and invention *volume 13 page 27*

transportation *volume 13 page 93*

autonomic nervous system (physiology)

nervous system *volume 9 page 36*

Autry, Gene (U.S. singer and actor)

country music *volume 3 page 208*

autumn (season)leaf *volume 7 page 119*season *volume 12 page 61***autumnal equinox** (astronomy)season *volume 12 page 61, picture, volume 12 page 61***avalanche** (geological event)MAIN ARTICLE *volume 1 page 238*

MORE TO EXPLORE

landslide *volume 7 page 104***avatar** (Hinduism)saint *volume 12 page 9***Avenue** (in roadway names)common abbreviations *table, volume 1 page 8***aviation**airport security *picture, volume 15 page 82*Earhart *volume 4 page 88*Wright brothers' first flight *picture, volume 15 page 76***Avicenna** (Persian physician)medicine *volume 8 page 93***avocado** (plant and fruit)MAIN ARTICLE *volume 1 page 238, picture, volume 1 page 238***axis** (Earth)Earth *volume 4 page 90*season *picture, volume 12 page 61***Axis Powers** (World War II alliance)Germany *volume 5 page 107*Japan *volume 7 page 15*World War II *volume 15 page 65***axon** (anatomy): *see in index* nerve fiber**Axum** (ancient kingdom in Africa): *see in index* Aksum**Axum** (city in Ethiopia): *see in index* Aksum**Ayatollah Ruhollah Khomeini** (Iranian leader): *see in index* Khomeini, Ayatollah Ruhollah**aye-aye** (primate)primate *picture, volume 10 page 149***Ayers Rock** (formation in Northern Territory, Australia): *see in index* Uluru/ Ayers Rock**Ayers Rock-Mount Olga National Park**

(park in Northern Territory, Australia):

see in index Uluru-Kata Tjuta National Park**Aymara** (Native American people)festival in La Paz *picture, volume 2 page 102***Ayutthaya** (kingdom in Thailand)Thailand *volume 13 page 55***azalea** (plant) *picture, volume 12**page 209***Azerbaijan** (country in Asia)MAIN ARTICLE *volume 1 page 239*

MORE TO EXPLORE

Armenia *volume 1 page 185***Aztec** (Native American people)MAIN ARTICLE *volume 1 page 240*

MORE TO EXPLORE

Aztec drawing *picture, volume 1 page 240*calendar: *see in index* Aztec calendarchocolate *volume 3 page 109*conquistador *volume 3 page 186*Cortés *volume 3 page 201*Mexico *volume 8 page 111*Mexico City *volume 8 page 114*vanilla *volume 14 page 57***Aztec calendar**calendar *volume 3 page 10***Aztec Empire** (Amerindian kingdom): *see in index* Aztec**Aztec language**: *see in index* Nahuatl language**Bab, the** (Iranian religious leader)Baha'i Faith *volume 2 page 7***Babbage, Charles** (British inventor and mathematician)computer *volume 3 page 173***Babel** (ancient city in Mesopotamia): *see in index* Babylon**Babelthup Island** (island in Palau)Palau *volume 10 page 16***Babe the Blue Ox** (legendary character)Bunyan *volume 2 page 150*statue *picture, volume 2 page 150***Babi** (Persian religious group)Baha'i Faith *volume 2 page 7***baboon** (primate)monkey *volume 8 page 167*olive baboons *picture, volume 8 page 168***Babur** (Mughal Empire founder)Mughal Empire *volume 8 page 202***baby** (growth stage): *see in index* infant**Babylon** (ancient city in Mesopotamia)Hammurabi *picture, volume 3 page 127***Babylonia** (ancient region in the Middle East)Mesopotamia *volume 8 page 104***Babylonian** (people)brick and tile *volume 2 page 129*census *volume 3 page 71***baby tooth** (anatomy): *see in index* primary tooth**Bach, Johann Sebastian** (German composer)MAIN ARTICLE *volume 2 page 4, picture, volume 2 page 4***backbone** (anatomy): *see in index* spine**backstroke** (swimming)swimming *volume 12 page 215***bacteria** (single-celled organisms)MAIN ARTICLE *volume 2 page 5, picture, volume 2 page 5*

MORE TO EXPLORE

animal disease *volume 4 page 55*antibiotics *volume 1 page 142, picture, volume 1 page 142*drug *volume 4 page 78*fermentation *volume 5 page 11*human disease *volume 4 page 56*immune system *picture, volume 6 page 119*intestines *volume 6 page 143*parasite *volume 10 page 32*plague *volume 10 page 92*Salmonella *picture, volume 5 page 46*scarlet fever *volume 12 page 48*tonsillitis *volume 13 page 81*tuberculosis *volume 13 page 104*typhoid fever *volume 13 page 124*

bacterial meningitis (disease)
meningitis *volume 8 page 99*

Bactrian camel (mammal) *picture, volume 3 page 19*
camel *volume 3 page 19*

Baden-Powell, Robert (British army officer)
scouting *volume 12 page 53*

badger (mammal)
MAIN ARTICLE *volume 2 page 5, picture, volume 2 page 6*

Badlands (region in the Dakotas, U.S.)
North Dakota *volume 9 page 87*
Theodore Roosevelt National Memorial Park *picture, volume 9 page 88*

Baekeland, Leo H. (U.S. chemist)
plastic *volume 10 page 97*

baggataway (sport): *see in index* lacrosse

Baghdad (capital city of Iraq)
MAIN ARTICLE *volume 2 page 6*
MORE TO EXPLORE
Iraq *volume 6 page 151*

bagpipe (musical instrument)
musical instruments *volume 8 page 216*

Bahadur Shah II (Mughal emperor)
Mughal Empire *volume 8 page 202*

Baha'i faith
MAIN ARTICLE *volume 2 page 7, picture, volume 2 page 7*

Bahamas, The (island country in the West Indies)
MAIN ARTICLE *volume 2 page 8, picture, volume 2 page 8*
MORE TO EXPLORE
beach *picture, volume 9 page 11*

Baha' Ullah (Iranian religious leader)
Baha'i Faith *volume 2 page 7*

Bahrain (country in the Middle East)
MAIN ARTICLE *volume 2 page 9, picture, volume 2 page 9*
MORE TO EXPLORE
Manama's Grand Mosque *picture, volume 8 page 39*

Bailey, James A. (U.S. circus impresario)
circus *volume 3 page 120*

Bairiki (capital city of Kiribati)
MAIN ARTICLE *volume 2 page 10, picture, volume 2 page 10*

MORE TO EXPLORE
Kiribati *volume 7 page 71*

Bakelite (chemical compound)
plastic *volume 10 page 97*

Baku (capital city of Azerbaijan)
MAIN ARTICLE *volume 2 page 10, picture, volume 2 page 10*

MORE TO EXPLORE
Azerbaijan *volume 1 page 239*

balance beam (gymnastics)
gymnastics *volume 5 page 175, picture, volume 5 page 176*

Balanchine, George (Russian-U.S. choreographer)
ballet *volume 2 page 15*
Tallchief *volume 13 page 12*

Balboa, Vasco Núñez de (Spanish explorer)
MAIN ARTICLE *volume 2 page 11, picture, volume 2 page 11*

MORE TO EXPLORE
exploration *volume 1 page 104*
Pacific Ocean *volume 10 page 5*

bald cypress (tree)
cypress *volume 3 page 235*
swamp growth *picture, volume 12 page 209*

bald eagle (bird) *picture, volume 4 page 86*
eagle *volume 4 page 86*

Balearic Islands (islands of Spain in Mediterranean Sea)
Spain *volume 12 page 153*

baleen whale (mammal)
whale *volume 15 page 36*

Balkan Mountains (mountains in Southern Europe)
rock formations *picture, volume 2 page 149*

Balkan Peninsula (region in Europe)
MAIN ARTICLE *volume 2 page 11*
MORE TO EXPLORE
geography

Adriatic Sea *volume 1 page 31*
Balkan Mountains, Bulgaria *picture, volume 2 page 149*
citadel at Krujë, Albania *picture, volume 1 page 65*
Danube River, Serbia *picture, volume 12 page 72*

Dniester River valley, Moldova *picture, volume 8 page 154*
Dubrovnik, Croatia *picture, volume 3 page 218, picture, volume 6 page 17*
Julian Alps, Slovenia *picture, volume 12 page 110*
Lake Bled, Slovenia *picture, volume 2 page 13*
landscape, Romania *picture, volume 11 page 84*
Ljubljana, Slovenia *picture, volume 7 page 171*
Mostar, Bosnia and Herzegovina *picture, volume 2 page 113*
NATO *volume 9 page 84*

Balkans (region in Europe): *see in index*
Balkan Peninsula

Balkan Wars (European history, 1912-13)
Greece *volume 5 page 152*

ball (baseball)
baseball *volume 2 page 31*
softball *volume 12 page 123*

ball (sports)
cricket *volume 3 page 214*
soccer *volume 12 page 116*

ballast tank (shipbuilding)
submarine *volume 12 page 197*

ballerina (female ballet dancer)
ballet *volume 2 page 14*

ballet (dance)
MAIN ARTICLE *volume 2 page 13, picture, volume 2 page 14*
MORE TO EXPLORE
"Swan Lake" *picture, volume 2 page 14*
dance *volume 4 page 13*

Ballet Folklórico de México (Mexican ballet company) *picture, volume 8 page 111*

Ballet Society (U.S. ballet company): *see in index* New York City Ballet

Ballets Russes (ballet company)
ballet *volume 2 page 14*

ball game (Native American culture)
Choctaw men *picture, volume 3 page 109*

ballistics
police *volume 10 page 113*

balloon (aircraft)MAIN ARTICLE *volume 2 page 15*

MORE TO EXPLORE

airplane *volume 1 page 57*hot-air balloon *picture, volume 2 page 16*parade balloon *picture, volume 2 page 15*weather balloon *picture, volume 3 page 137***ballot** (voting and elections) *picture, volume 10 page 114***ball python** (snake)python *volume 10 page 172***balsam** (tree): *see in index fir***Baltics** (region of Europe): *see in index Baltic states***Baltic Sea** (sea in Europe)MAIN ARTICLE *volume 2 page 17, picture, volume 2 page 17***Baltic states** (region of Europe): *see in index Estonia; Latvia; Lithuania***Baltimore** (city in Maryland, U.S.)Inner Harbor buildings *picture, volume 8 page 68***Baltimore, Lord** (British statesman)Maryland *volume 8 page 68***Bamako** (capital city of Mali)MAIN ARTICLE *volume 2 page 17*

MORE TO EXPLORE

Mali *volume 8 page 32***bamboo** (plant)MAIN ARTICLE *volume 2 page 18, picture, volume 2 page 18*

MORE TO EXPLORE

grass *volume 5 page 141*panda *volume 10 page 25, picture, volume 10 page 25***banana** (plant and fruit)MAIN ARTICLE *volume 2 page 18, picture, volume 2 page 19*

MORE TO EXPLORE

fruit *picture, volume 5 page 72***Banda Oriental del Uruguay** (historical region in Uruguay)Uruguay *volume 14 page 43***Bandar Seri Begawan** (capital city of Brunei)MAIN ARTICLE *volume 2 page 19, picture, volume 2 page 20*

MORE TO EXPLORE

Brunei *volume 2 page 137***banded anteater** (mammal): *see in index numbat***banded sea krait** (sea snake) *picture, volume 12 page 60***Banff National Park** (park in Alberta, Canada) *picture, volume 3 page 23*Lake Louise *picture, volume 1 page 69***Bangkok** (capital city of Thailand)MAIN ARTICLE *volume 2 page 20, picture, volume 2 page 20*

MORE TO EXPLORE

Buddhist temple *picture, volume 13 page 42*Thailand *volume 13 page 54***Bangladesh** (country in South Asia)MAIN ARTICLE *volume 2 page 21*

MORE TO EXPLORE

Ganges River *volume 5 page 87*India *volume 6 page 125*Meghna River *picture, volume 2 page 22*Pakistan *volume 10 page 15***Bangui** (capital city of the Central African Republic)MAIN ARTICLE *volume 2 page 23*

MORE TO EXPLORE

Central African Republic *volume 3 page 73***Banjul** (capital city of The Gambia)MAIN ARTICLE *volume 2 page 23, picture, volume 2 page 23*

MORE TO EXPLORE

Gambia *volume 5 page 84***bank** (financial business)MAIN ARTICLE *volume 2 page 24*

MORE TO EXPLORE

automated teller machine in Shanghai, China *picture, volume 2 page 25*banking in Florence *picture, volume 2 page 26*opening a savings account *picture, volume 2 page 24*Switzerland *volume 12 page 219***Banneker, Benjamin** (U.S. scientist)MAIN ARTICLE *volume 2 page 26, picture, volume 2 page 26***banning of books:** *see in index censorship***Bantu peoples**Angola *volume 1 page 122*South Africa *volume 12 page 138***baobab** (tree) *picture, volume 12 page 66***baptism** (Christianity)Mormons *volume 8 page 182***barb** (feather part)feather *volume 5 page 9***Barbados** (island country in the West Indies)MAIN ARTICLE *volume 2 page 27***Barbaro** (U.S. racehorse)winning the 2006 Kentucky Derby *picture, volume 6 page 87***Barbary Coast** (historical region in North Africa)pirate *volume 10 page 89***barbel** (fish anatomy)carp *volume 3 page 42*catfish *volume 3 page 60, picture, volume 3 page 60*cod *volume 3 page 147***“Barber of Seville, The”** (opera by Rossini) *picture, volume 9 page 142***barbule** (feather part)feather *volume 5 page 9, picture, volume 5 page 8***Barcelona** (city in Spain)church of the Holy Family *picture, volume 12 page 154***barge** (boat)Mississippi River *picture, volume 8 page 144, picture, volume 11 page 67***bar graph** (diagram)graph *volume 5 page 140***bark** (plant tissue)MAIN ARTICLE *volume 2 page 28, picture, volume 2 page 28*

MORE TO EXPLORE

redwood *volume 11 page 38***barley** (grain)MAIN ARTICLE *volume 2 page 28*

MORE TO EXPLORE

kernels *picture, volume 2 page 28***bar magnet** (device)magnetic field *picture, volume 8 page 18*
magnetic poles *picture, volume 8 page 19***barnacle** (crustacean)crustacean *volume 3 page 224*

Barnard, A. M. (American author): *see in index* Alcott, Louisa May

Barnum, P. T. (U.S. showman)
circus *volume 3 page 120*

Barnum & Bailey Circus (U.S. circus)
advertisement *picture, volume 3 page 120*

barometer (measuring instrument)
weather *volume 15 page 28*

barometric pressure: *see in index* atmospheric pressure

baroque (artistic style)
architecture *volume 1 page 171*
painting *volume 10 page 10*
sculpture *volume 12 page 56*

barracuda (fish)
MAIN ARTICLE *volume 2 page 29, picture, volume 2 page 29*

barrier reef (geology)
Great Barrier Reef *picture, volume 5 page 145*

Bartholdi, Frédéric-Auguste (French sculptor)
Statue of Liberty *volume 7 page 140*

Barton, Clara (U.S. nurse and teacher)
MAIN ARTICLE *volume 2 page 29, picture, volume 2 page 30*

MORE TO EXPLORE
nursing *volume 9 page 112*

Barú (volcano in Panama)
Panama *volume 10 page 21*

basalt (rock)
Devil's Postpile *picture, volume 11 page 75*

base (baseball)
baseball *volume 2 page 30*
softball *volume 12 page 122*

base (chemical substance)
MAIN ARTICLE *volume 1 page 17, picture, volume 1 page 17*

base (component of DNA)
DNA *volume 4 page 61*

baseball (ball)
baseball-throwing robot *picture, volume 11 page 74*
description *volume 2 page 31*

baseball (sport)

MAIN ARTICLE *volume 2 page 30*

MORE TO EXPLORE

2004 World Series *picture, volume 2 page 30*

Babe Ruth *picture, volume 11 page 109*

Campanella, Doby, Newcombe, and Robinson *picture, volume 2 page 32*
field *picture, volume 2 page 31*

baseball trading card *picture, volume 13 page 88*

base on balls (sports): *see in index* walk

base-ten number system (mathematics)
Hindu-Arabic numeral development
picture, volume 9 page 107
numbers and number systems *volume 9 page 107*
Roman numerals *volume 11 page 86*

base-two number system (mathematics)
numbers and number systems *volume 9 page 107*

Basho (Japanese poet)
MAIN ARTICLE *volume 2 page 33, picture, volume 2 page 33*

Basie, Count (U.S. musician)
jazz *volume 7 page 16*

basilica (building)
Antigua Basilica of Guadalupe *picture, volume 8 page 114*
architecture *volume 1 page 169*

Basilica di San Marco (church in Venice, Italy)
Venice *volume 14 page 65*

basin (land drained by a river)
river *volume 11 page 68*

basket (sports equipment)
basketball *volume 2 page 35*

basketball (sport)
MAIN ARTICLE *volume 2 page 33, picture, volume 2 page 34, picture, volume 2 page 35*

MORE TO EXPLORE
Johnson *volume 7 page 30, picture, volume 7 page 30*

basketball court *picture, volume 2 page 34*
basketball *volume 2 page 33*

basketry
Carib basket weaver *picture, volume 3 page 40*

Paiute basket weaver *picture, volume 10 page 12*

Pomo Indian basket *picture, volume 10 page 120*

Tohono O'odham Indian basket *picture, volume 13 page 75*

Winnebago basket weaver *picture, volume 15 page 50*

basket weaving: *see in index* basketry

Basque (language): *see in index* Euskara

Basque (people)
MAIN ARTICLE *volume 2 page 36, picture, volume 2 page 36*

MORE TO EXPLORE
France *volume 5 page 58*
Spain *volume 12 page 154*

bass (fish)
MAIN ARTICLE *volume 2 page 37*

bass (musical instrument): *see in index* double bass

bass drum (musical instrument)
percussion instruments *picture, volume 8 page 215*

Basse-Terre (island in Guadeloupe)
Guadeloupe *volume 5 page 164*

Basseterre (capital city of Saint Kitts and Nevis)
MAIN ARTICLE *volume 2 page 37*
MORE TO EXPLORE

Saint Kitts and Nevis *volume 12 page 12*

bassoon (musical instrument)
wind instruments *picture, volume 8 page 217*

Bastille (historic prison in Paris, France)
Bastille Day *volume 2 page 38*
French Revolution *volume 5 page 69*

Bastille Day (French holiday)
MAIN ARTICLE *volume 2 page 38, picture, volume 2 page 38*

Basutoland (former British colony in Africa): *see in index* Lesotho

bat (mammal)
MAIN ARTICLE *volume 2 page 38, picture, volume 2 page 38*

MORE TO EXPLORE
ear *picture, volume 4 page 87*
hibernation *volume 6 page 49*
mammals *volume 8 page 35*

bat (sports equipment)

baseball *volume 2 page 31*

cricket *volume 3 page 214*

Batavia (capital city of Indonesia): *see in index* Jakarta

batch (glassmaking)

glass *volume 5 page 118*

Bathurst (capital city of The Gambia): *see in index* Banjul

bathyscaphe (diving vessel) *picture, volume 4 page 174*

exploration *volume 4 page 174*

Batista, Fulgencio (Cuban dictator)

Castro *volume 3 page 55*

Baton Rouge (state capital of Louisiana, U.S.)

MAIN ARTICLE *volume 2 page 39*

MORE TO EXPLORE

Louisiana *volume 7 page 180*

batsman (cricket)

cricket *volume 3 page 214, picture, volume 3 page 214*

battery (electronics)

MAIN ARTICLE *volume 2 page 39*

MORE TO EXPLORE

automobile *volume 1 page 236, picture, volume 1 page 235*

flashlight *picture, volume 2 page 40*

Battery, The (garden park in Charleston, South Carolina, U.S.)

homes and landmarks *picture, volume 12 page 148*

battery-operated toy

toy *volume 13 page 84*

Battle of: *see in index under the specific part of the name, for example, Bull Run, Battle of except as found below*

Battle of Manassas (1861, United States history): *see in index* Bull Run, Battle of

Battle of Monmouth Court House

(American Revolution, 1778): *see in index* Monmouth, Battle of

Battle of the Ardennes (World War II):

see in index Bulge, Battle of the

Bauhaus (German school of design)

decorative arts *volume 4 page 25*

bay leaf (herb)

herb *volume 6 page 45*

laurel *volume 7 page 116*

Bay of: *see in index under the specific part of the name, for example, Fundy, Bay of except as found below*

Bay of Pigs invasion (Cuban-U.S. history)

Cuba *volume 3 page 228*

Kennedy *volume 7 page 54*

bayou (inland waterway and swamp area)

Louisiana *volume 7 page 180*

Bay State (state in the U.S.): *see in index*

Massachusetts

bay-winged cowbird (bird)

cowbirds *volume 3 page 209*

BBC: *see in index* British Broadcasting Corporation

BC (division of time for dating events): *see in index* before Christ

B cell (blood cell)

immune system *volume 6 page 119,*

picture, volume 6 page 119

lymphatic system *volume 7 page 191*

beach (geology)

beach cleanup *picture, volume 4 page 143*

Hawaii *picture, volume 11 page 22*

palms *picture, volume 10 page 20*

Portugal *picture, volume 7 page 153,*

picture, volume 10 page 133

The Bahamas *picture, volume 9 page 11*

beaded lizard (reptile)

lizard *volume 7 page 170*

beagle (breed of dog)

hound breeds *table, volume 4 page 62*

beak (bird anatomy)

birds and feeding habits *picture, volume 2 page 77*

falcon *volume 5 page 5*

flamingo *volume 5 page 31*

beam bridge (transportation structure)

bridge *volume 2 page 130, picture, volume 2 page 130*

bean (legume)

MAIN ARTICLE *volume 2 page 40, picture, volume 2 page 41, picture, volume 2*

page 41

MORE TO EXPLORE

growth of plant from seed *picture, volume 10 page 96*

legume *volume 7 page 125*

“Bean Eaters, The” (poetry by Gwen-dolyn Brooks)

Brooks *volume 2 page 136*

bear (mammal)

MAIN ARTICLE *volume 2 page 41*

MORE TO EXPLORE

brown bears *picture, volume 2 page 42*

hibernation *volume 6 page 50*

polar bear *picture, volume 2 page 42*

Bearhat Mountain (mountain in Glacier National Park, Montana, U.S.) *picture,*

volume 8 page 174

beat (music)

music *volume 8 page 212*

Beatlemania (rock music culture)

the Beatles *volume 2 page 43*

Beatles, the (British rock group)

MAIN ARTICLE *volume 2 page 42, picture, volume 2 page 43*

MORE TO EXPLORE

rock music *volume 11 page 78*

beaver (rodent)

MAIN ARTICLE *volume 2 page 43*

MORE TO EXPLORE

Eurasian beaver *picture, volume 2 page 44*

lodge *picture, volume 2 page 44*

beaver dam

beaver *volume 2 page 43*

beaver lodge *picture, volume 2 page 44*

beaver *volume 2 page 44*

Beaver State (state in the U.S.): *see in index* Oregon

Bechuanaland (country in Africa): *see in index* Botswana

Bechuanaland Protectorate (British protectorate in Africa)

Botswana *volume 2 page 117*

Beckham, David (British soccer player)

MAIN ARTICLE *volume 2 page 45, picture, volume 2 page 45*

Becknell, William (U.S. explorer)

Santa Fe Trail *volume 12 page 33*

Bede (Anglo-Saxon historian)

history of the English people *picture, volume 6 page 64*

Bedloe's Island (island in New York, U.S.): *see in index* Liberty Island

Bedouin (people)
Syria *volume 12 page 223*

bedrock (geology)
soil *volume 12 page 125*

bee (insect)
MAIN ARTICLE *volume 2 page 45*
MORE TO EXPLORE

cross-pollination *picture, volume 10 page 117*
honeybee *picture, volume 2 page 46*
insect *volume 6 page 139*

beechnut (botany)
nut *volume 9 page 112*

beef cattle (livestock): *see in index* cattle

Beehive State (state in the U.S.): *see in index* Utah

bee hummingbird (bird)
bird *volume 2 page 76*
hummingbirds *volume 6 page 98*

beer (alcoholic beverage)
barley *volume 2 page 29*

beeswax
bee *volume 2 page 45*

beet (plant and edible root)
MAIN ARTICLE *volume 2 page 46, picture, volume 2 page 46*

Beethoven, Ludwig van (German composer)
MAIN ARTICLE *volume 2 page 47, picture, volume 2 page 47*

MORE TO EXPLORE
classical music *volume 3 page 132*
statue *picture, volume 2 page 107*

beetle (insect)
MAIN ARTICLE *volume 2 page 48, picture, volume 2 page 49*

before Christ (division of time for dating events)
common abbreviations *table, volume 1 page 8*

Begin, Menachem (prime minister of Israel)
Sadat *volume 12 page 6*

Beihai Park (park in Beijing, China)
Beijing *volume 2 page 50*

Beijing (capital city of China)
MAIN ARTICLE *volume 2 page 49*

MORE TO EXPLORE
China *volume 3 page 101*
dragon sculpture *picture, volume 1 page 128*
Forbidden City *picture, volume 3 page 104*
Temple of Heaven *picture, volume 2 page 50*

Beirut (capital city of Lebanon)
MAIN ARTICLE *volume 2 page 51, picture, volume 2 page 51*

MORE TO EXPLORE
Lebanon *volume 7 page 120*

Bekaa Valley (valley in Lebanon)
Lebanon *volume 7 page 120*

Belarus (country in Europe)
MAIN ARTICLE *volume 2 page 52, picture, volume 2 page 52*
MORE TO EXPLORE
Palm Sunday *picture, volume 8 page 137*

Belaya River (river in Russia)
Ural Mountains *picture, volume 14 page 38*

Belfast (capital city of Northern Ireland, United Kingdom)
MAIN ARTICLE *volume 2 page 53*

MORE TO EXPLORE
Northern Ireland *volume 9 page 89*
Queen's University *picture, volume 2 page 53*

Belfast Agreement (Ireland and the United Kingdom, 1998)
Belfast *volume 2 page 53*

Belgian Congo (Belgian colony in Africa)
Belgium *volume 2 page 55*
Democratic Republic of the Congo *volume 3 page 180*

Belgium (country in Europe)
MAIN ARTICLE *volume 2 page 54, picture, volume 2 page 54, picture, volume 2 page 55*

MORE TO EXPLORE
history
Democratic Republic of the Congo *volume 3 page 180*
Kinshasa *volume 7 page 70*

Belgrade (capital city of Serbia)
MAIN ARTICLE *volume 2 page 56, picture, volume 2 page 56*

MORE TO EXPLORE
Danube River *picture, volume 12 page 72*
Serbia *volume 12 page 71*
Yugoslavia *volume 15 page 95*

Belize (country in Central America)
MAIN ARTICLE *volume 2 page 57, picture, volume 2 page 57*

Belize City (city in Belize)
Belmopan *volume 2 page 59*

bell (musical instrument)
church *volume 3 page 117*

Bell, Alexander Graham (U.S. inventor)
MAIN ARTICLE *volume 2 page 58, picture, volume 2 page 58*

MORE TO EXPLORE
technology and invention *volume 13 page 27*
telecommunication *volume 13 page 34*
telephone *volume 13 page 37*

Bell, Cool Papa (U.S. baseball player)
MAIN ARTICLE *volume 2 page 58, picture, volume 2 page 59*

belladonna (plant): *see in index* deadly nightshade

Bellerophon (Greek mythology)
Pegasus *volume 10 page 49*

bell pepper (plant)
pepper *volume 10 page 59*

Bell Telephone Company (U.S. corporation)
Bell *volume 2 page 58*

bell tower (architectural feature)
church in Connecticut *picture, volume 3 page 117*

belly button (anatomy): *see in index* navel

belly dance
dance *volume 4 page 12*

Belmopan (capital city of Belize)
MAIN ARTICLE *volume 2 page 59, picture, volume 2 page 59*

MORE TO EXPLORE
Belize *volume 2 page 57*

Bemba (African people)
Zambia *volume 15 page 101*

Bengal (region in Asia)
Bangladesh *volume 2 page 22*

Bengal tiger (animal)tiger *volume 13 page 65***Benin** (country in Africa)MAIN ARTICLE *volume 2 page 60*, *picture, volume 2 page 60*

MORE TO EXPLORE

Cotonou *picture, volume 3 page 205***Benton, Thomas Hart** (U.S. author and politician)Frémont *volume 5 page 65***Benz, Karl** (German engineer)technology and invention *volume 13 page 27***Beograd** (capital city of Serbia): *see in index* Belgrade**Beothuk** (Native American people)Newfoundland and Labrador *volume 9 page 46***“Beowulf”** (Old English poem)literature *volume 7 page 161***Berber** (North African people)Algeria *volume 1 page 78*
Mauritania *volume 8 page 79*
Morocco *volume 8 page 183***Bergen** (city in Norway) *picture, volume 9 page 98***Bering Sea** (sea of the Pacific Ocean)MAIN ARTICLE *volume 2 page 61*, *picture, volume 2 page 61***Bering Strait** (strait in the Pacific Ocean)Arctic Ocean *volume 1 page 172***Berlin** (capital city of Germany)MAIN ARTICLE *volume 2 page 61*

MORE TO EXPLORE

Cold War *volume 3 page 150*
Germany *volume 5 page 105***Berlin airlift** (Cold War history, 1948-49)Cold War *volume 3 page 151***Berliner, Emil** (U.S. inventor)sound recording *volume 12 page 136***Berlin Wall** (wall in Berlin, Germany)*picture, volume 3 page 151*
Berlin *volume 2 page 62*
Cold War *volume 3 page 151*
Germany *volume 5 page 107***Bermuda** (islands and British colony in the Atlantic Ocean)MAIN ARTICLE *volume 2 page 62***Bermuda cedar** (tree)endangered species *volume 4 page 134***Bern** (capital city of Switzerland)MAIN ARTICLE *volume 2 page 63*

MORE TO EXPLORE

Switzerland *volume 12 page 218***Bernini, Gian Lorenzo** (Italian artist)sculpture *volume 12 page 57***berry** (fruit and plant reproductive body)MAIN ARTICLE *volume 2 page 64*, *picture, volume 2 page 64*

MORE TO EXPLORE

holly *picture, volume 6 page 70*
juniper *volume 7 page 40*, *picture, volume 7 page 40***Berry, Chuck** (U.S. musician and singer)rock *volume 11 page 78***Bessarabia** (region in Europe): *see in index* Moldova**Bessemer, Henry** (English inventor)technology and invention *volume 13 page 27***Bethlehem** (town in the West Bank)MAIN ARTICLE *volume 2 page 64*, *picture, volume 2 page 65***Bethune, Mary McLeod** (U.S. educator)MAIN ARTICLE *volume 2 page 65*, *picture, volume 2 page 65***Bethune-Cookman College** (college inDaytona Beach, Florida, U.S.)
Bethune *volume 2 page 65***beverage**industrial packaging *picture, volume 6 page 134***Beverly Hills** (city in California, U.S.)Los Angeles *volume 7 page 178***Beverwyck** (colonial settlement in NewYork, U.S.): *see in index* Albany**bharata-natyam** (Indian classical dance)dance *volume 4 page 13***Bhutan** (country in Asia)MAIN ARTICLE *volume 2 page 66*

MORE TO EXPLORE

Buddhist monastery *picture, volume 2 page 66***Bhutia** (Asian people)Bhutan *volume 2 page 66***Bible** (sacred text)MAIN ARTICLE *volume 2 page 67*

MORE TO EXPLORE

Christianity *volume 3 page 112*
Greek Bible *picture, volume 2 page 68*
Gutenberg Bible *picture, volume 5 page 172*
handwritten Bible *picture, volume 2 page 67*
Jesus Christ *volume 7 page 22*
Moses *volume 8 page 187*
Protestantism *volume 10 page 158*
Roman Catholicism *volume 11 page 82***biceps muscle** (anatomy)skeletal muscle *picture, volume 8 page 208***bicuspid** (tooth)teeth *volume 13 page 30***bicycle**MAIN ARTICLE *volume 2 page 68*

MORE TO EXPLORE

machine *volume 8 page 7*
ordinary *picture, volume 2 page 69*
transportation *volume 13 page 93***bicycle motocross race** (sport)cycling *volume 3 page 235***big-band jazz** (music)jazz *volume 7 page 16***big bang** (cosmology)universe *volume 14 page 37***Big Ben** (bell in London, England, United Kingdom) *picture, volume 3 page 140*London *picture, volume 7 page 175***Bigfoot** (legendary creature): *see in index* Sasquatch**Bigheart, Peter** (chief of Osage people)*picture, volume 9 page 152***bighorn sheep** (mammal)sheep *volume 12 page 79***Big House ritual** (Native American ceremony)Delaware people *volume 4 page 29***Big Island, the** (island in Hawaii, U.S.): *see in index* Hawaii**big-leaf magnolia** (tree)magnolia *volume 8 page 20***big-leaf mahogany** (tree)mahogany *volume 8 page 21*

Big Muddy (river in the U.S.): *see in index* Missouri River

Big Sur (region in California, U.S.)
coastline *picture, volume 3 page 12*

big-tooth aspen (tree)
aspen *volume 1 page 210*

big tree: *see in index* giant sequoia

bile (digestive fluid)
liver *volume 7 page 167*

bile duct (anatomy)
proximity to liver *picture, volume 7 page 167*

bilingualism
Hispanic Americans *volume 6 page 63*

bill (bird anatomy): *see in index* beak

bill (government)
United States government *volume 14 page 34*

bill of rights (government)
MAIN ARTICLE *volume 2 page 70*

Bill of Rights (U.S. Constitution): *see in index* United States Bill of Rights

Biloxi (city in Mississippi, U.S.)
house and church *picture, volume 8 page 142*

binary number system (mathematics):
see in index base-two number system

Bindusara (Mauryan emperor)
Mauryan Empire *volume 8 page 81*

bin Laden, Osama (Saudi Arabian terrorist)
MAIN ARTICLE *volume 2 page 71, picture, volume 2 page 71*
MORE TO EXPLORE
Bush *volume 2 page 157*

binoculars (magnifying device)
MAIN ARTICLE *volume 2 page 72, picture, volume 2 page 72*

biodiversity (environmental science)
worldwide diversity *picture, volume 7 page 167*

Bioko (island and province in Equatorial Guinea)
Equatorial Guinea *volume 4 page 148*
Malabo *volume 8 page 24*

biological sciences: *see in index* life sciences

biology (science)
MAIN ARTICLE *volume 2 page 73*

bioluminescence (chemical reaction)
firefly *volume 5 page 27, picture, volume 5 page 26*
tunicates *picture, volume 7 page 148*

biome (life science)
MAIN ARTICLE *volume 2 page 73*

biosphere
environment *volume 4 page 144*

biplane (aircraft)
airplane *volume 1 page 53*

birch (tree)
MAIN ARTICLE *volume 2 page 75, picture, volume 2 page 75*

bird (animal)
MAIN ARTICLE *volume 2 page 76*
MORE TO EXPLORE
albatross *volume 1 page 68*
animal *volume 1 page 125*
brain *volume 2 page 122, picture, volume 2 page 122*
communication and singing *picture, volume 3 page 167*
different types of bills *picture, volume 2 page 77*
dinosaur *volume 4 page 49*
ear *volume 4 page 88*
egg *volume 4 page 108*
endangered species *volume 4 page 134*
California Condor chick *picture, volume 15 page 108*
feather *volume 5 page 8*
heart *volume 6 page 32*
kingfisher *picture, volume 7 page 67*
knee *volume 7 page 74, picture, volume 7 page 73*
leg *volume 7 page 124*
nest *volume 9 page 36, picture, volume 9 page 37*
nose *volume 9 page 100*
prehistoric life *volume 10 page 146*
seed *volume 12 page 63*
urinary system *volume 14 page 41*
vertebrate *volume 14 page 72*

bird, flightless
MAIN ARTICLE *volume 2 page 78*
MORE TO EXPLORE
birds *volume 2 page 77*

bird-hipped dinosaur (dinosaur order):
see in index Ornithischia

bird of prey
MAIN ARTICLE *volume 2 page 80*
MORE TO EXPLORE
hawk *volume 6 page 28*

Birger Jarl (Swedish ruler)
Stockholm *volume 12 page 187*

birth
endocrine system *volume 4 page 135*
reproductive system *volume 11 page 49*

birth control
women's rights *volume 15 page 58*

Bishkek (capital city of Kyrgyzstan)
MAIN ARTICLE *volume 2 page 81, picture, volume 2 page 81*
MORE TO EXPLORE
Kyrgyzstan *volume 7 page 94*

bishop (Christianity)
cathedral *volume 3 page 60*

Bislama (language)
Vanuatu *volume 14 page 58*

Bismarck (state capital of North Dakota, U.S.)
MAIN ARTICLE *volume 2 page 81*
MORE TO EXPLORE
North Dakota *volume 9 page 87*

Bismarck, Otto von (German chancellor and prime minister) *picture, volume 10 page 161*
Prussia *volume 10 page 161*

bison (mammal)
MAIN ARTICLE *volume 2 page 82*
MORE TO EXPLORE
American bison *picture, volume 2 page 82, picture, volume 2 page 82*
cave painting *picture, volume 10 page 8*

Bissau (capital city of Guinea-Bissau)
MAIN ARTICLE *volume 2 page 83*
MORE TO EXPLORE
Guinea-Bissau *volume 5 page 170*

bitter almond (tree and nut)
almond *volume 1 page 87*

Bitterroot Mountains (mountain range in the U.S.) *picture, volume 6 page 112*

bituminous coal (mineral)
coal *volume 3 page 144*

bivalve (mollusk class)
MAIN ARTICLE *volume 2 page 83, picture, volume 2 page 83*

MORE TO EXPLORE

mollusk *volume 8 page 157*
 mussel *picture, volume 8 page 157*
 shell *volume 12 page 80*

black (color)

pigment *picture, volume 3 page 156*

black American (people): *see in index*
African American**black-and-gold howler** (monkey)

primate *picture, volume 10 page 149*

black-backed jackal (mammal) *picture,*

volume 7 page 4
 jackal *volume 7 page 4*

black bass (fish)

bass *volume 2 page 37*

black bear (mammal)

bear *volume 2 page 41*

Blackbeard (English pirate) *picture, volume 10 page 89***blackberry** (fruit)

raspberry *volume 11 page 27*

black-billed magpie (bird)

magpie *volume 8 page 20*

blackbird (bird)

MAIN ARTICLE *volume 2 page 84, picture, volume 2 page 84*

blackboard (teaching tool)

African school *picture, volume 4 page 107*
 writing *picture, volume 15 page 78*

black-browed albatross (seabird) *picture, volume 1 page 68***blackbuck** (mammal)

antelopes *picture, volume 1 page 139*

Black Carib (people): *see in index* Garifuna**Black Death** (pandemic)

epidemic *volume 4 page 146*
 plague *volume 10 page 91*
 Shakespeare *volume 12 page 75*

Blackfoot (Native American people)

MAIN ARTICLE *volume 2 page 85*

MORE TO EXPLORE

Blackfoot traditional dress *picture, volume 2 page 85*
 Sarcee *volume 12 page 38*

Black Forest (mountainous region in Germany)

farm *picture, volume 5 page 105*
 Germany *volume 5 page 105*

Black Hawk (Sauk and Fox leader)

MAIN ARTICLE *volume 2 page 86, picture, volume 2 page 86*

MORE TO EXPLORE

Iowa *volume 6 page 145*
 Sauk *volume 12 page 46*

Black Hawk War (U.S. history)

Black Hawk *volume 2 page 86*
 Sauk *volume 12 page 46*

Black Hills (region in the U.S.)

MAIN ARTICLE *volume 2 page 86, picture, volume 2 page 87*

MORE TO EXPLORE

South Dakota *volume 12 page 149, picture, volume 12 page 150*

Black Hills War (U.S. history, 1876)

Black Hills *volume 2 page 87*
 Custer *volume 3 page 233*

black hole (astronomy)

MAIN ARTICLE *volume 2 page 87, picture, volume 2 page 87*

MORE TO EXPLORE

Milky Way *volume 8 page 129*
 star *volume 12 page 180*

Black Moses (Jamaican leader): *see in index* Garvey, Marcus**black nationalism** (U.S. history)

Garvey *volume 5 page 90*

black-necked cobra (snake) *picture, volume 3 page 145***black panther** (mammal)

leopard *volume 7 page 133*

black powder (explosive): *see in index* gunpowder**Black Power** (U.S. philosophical movement)

1968 Olympic Games *picture, volume 1 page 44*
 African Americans *volume 1 page 44*
 civil rights movement *volume 3 page 131*

black rhinoceros (mammal) *picture, volume 11 page 59*

rhinoceros *volume 11 page 59*

Black Sea (sea in Eurasia)

MAIN ARTICLE *volume 2 page 88*

MORE TO EXPLORE

Crimean Peninsula *picture, volume 14 page 6*
 Turkey *picture, volume 2 page 89*

black-spotted trout (fish)

trout *volume 13 page 99*

Black Stone of Mecca (Islam)

Mecca *volume 8 page 91*

Blackwell, Elizabeth (U.S. medical doctor)

MAIN ARTICLE *volume 2 page 89, picture, volume 2 page 89*

black widow (spider)

spider *volume 12 page 165*

bladder (anatomy)

urinary system *volume 14 page 40, picture, volume 14 page 41*

blade (plant leaf)

leaf *volume 7 page 118*

Blaine, David (U.S. magician)

magic *volume 8 page 17*

Blanc, Mont (mountain in Europe)

Alps *volume 1 page 90*
 France *volume 5 page 58*

Blantyre (city in Malawi)

Lilongwe *volume 7 page 150*

Bled, Lake (lake in Slovenia) *picture, volume 2 page 13***Bleda** (Hun leader)

Hun *volume 6 page 99*

blimp (aircraft)

airship *volume 1 page 58*

blindness (medical disorder)

MAIN ARTICLE *volume 2 page 90*

blind snake (reptile)

snake *volume 12 page 112*

blitzkrieg (military tactic)

World War II *volume 15 page 66*

blizzard (weather)

storm *volume 12 page 193*

Bloemfontein (judicial capital city of South Africa)

MAIN ARTICLE *volume 2 page 91, picture, volume 2 page 91*

MORE TO EXPLORE

South Africa *volume 12 page 137*

Blood (North American people)

Blackfoot *volume 2 page 85*

blood (biochemical compound)

MAIN ARTICLE *volume 2 page 91*

MORE TO EXPLORE

bone *volume 2 page 106*

cardiovascular system *volume 3 page 38, picture, volume 3 page 39*

blood flow *picture, volume 3 page 38*

blood functions *picture, volume 3 page 40*

circulatory system *volume 3 page 119*

components *picture, volume 2 page 92*

kidney *volume 7 page 63*

liver *volume 7 page 166*

respiratory system *volume 11 page 55*

urinary system *volume 14 page 40, picture, volume 14 page 40*

blood bank

blood donation *picture, volume 2 page 92*

blood cell (physiology)

blood *volume 2 page 91*

blood vessel (anatomy)

cardiovascular system *volume 3 page 38*

cholesterol *picture, volume 3 page 111, picture, volume 3 page 111*

physiology *picture, volume 7 page 190*

tumor development *picture, volume 3 page 30*

Bloody Sunday (1905, Russian history)

Saint Petersburg *volume 12 page 17*

blowhole (cetacean anatomy)

nose *volume 9 page 99*

whale *volume 15 page 38*

blubber (animal anatomy)

whale *volume 15 page 38*

blue (color)

light *picture, volume 3 page 155*

pigment *picture, volume 3 page 156*

blueberry (plant and fruit)

MAIN ARTICLE *volume 2 page 93, picture, volume 2 page 93*

bluebird (bird)

MAIN ARTICLE *volume 2 page 93, picture, volume 2 page 93*

blue crab (crustacean)

Maryland *volume 8 page 69*

bluefin tuna (fish) *picture, volume 13 page 107*

tuna *volume 13 page 106*

bluegrass (music)

country music *volume 3 page 208*

bluegrass (plant)

grass *volume 5 page 141*

blue mockingbird (bird)

mockingbird *volume 8 page 150*

Blue Mosque (mosque in Istanbul, Turkey) *picture, volume 6 page 171, picture, volume 8 page 188*

Blue Mountains (mountains in New South Wales, Australia)

Three Sisters *picture, volume 9 page 53*

Blue Nile (river in Africa)

Nile River *volume 9 page 72*

blue peacock (bird)

peacock *volume 10 page 46*

blue period (Picasso)

Picasso *volume 10 page 80*

Blue Ridge Mountains (mountain range in the U.S.)

MAIN ARTICLE *volume 2 page 94, picture, volume 2 page 95*

MORE TO EXPLORE

North Carolina *volume 9 page 85*

Shenandoah National Park *picture, volume 14 page 94*

Tennessee *volume 13 page 43*

Blue Ridge Parkway (scenic highway in the U.S.)

Blue Ridge Mountains *volume 2 page 94*

blues, the (music)

MAIN ARTICLE *volume 2 page 95*

MORE TO EXPLORE

jazz *volume 7 page 16*

blue whale (mammal)

ocean *volume 9 page 118*

whale *volume 15 page 38, picture, volume 15 page 37*

Blume, Judy (U.S. author)

MAIN ARTICLE *volume 2 page 96, picture, volume 2 page 96*

BMX bicycle (vehicle)

bicycle *volume 2 page 69*

BMX race (sport): *see in index* bicycle

motocross race

boa (snake)

snake *volume 12 page 112*

boa constrictor (snake)

MAIN ARTICLE *volume 2 page 96, picture, volume 2 page 96*

MORE TO EXPLORE

various snakes *picture, volume 12 page 113*

boar (mammal)

African wild pig *picture, volume 10 page 83*

pig *volume 10 page 83*

boat (small watercraft)

MAIN ARTICLE *volume 2 page 97, picture, volume 2 page 97*

MORE TO EXPLORE

Bangladesh fishing boat *picture, volume 2 page 22*

barge *picture, volume 11 page 67*

feluccas on the Nile *picture, volume 9 page 72*

Ghana fishing boat *picture, volume 5 page 111*

gondolas *picture, volume 3 page 28, picture, volume 14 page 65*

harbor at Moroni *picture, volume 8 page 185*

mule-powered boat *picture, volume 4 page 150*

rowboat *picture, volume 8 page 96*

types *picture, volume 2 page 98*

boating: *see in index* boat

bob (pendulum part) *picture, volume 10 page 52*

pendulum *volume 10 page 51*

bobbin (weaving)

lace making *picture, volume 7 page 100*

bobbin lace (decorative fabric) *picture,*

volume 7 page 100

lace *volume 7 page 99*

bobcat (mammal)

lynx *volume 7 page 191*

Bodh Gaya (village in India)

Buddhist temple *picture, volume 8 page 81*

pilgrimage *volume 10 page 85*

body (human anatomy): *see in index* human body

body (vehicle)

automobile *volume 1 page 235*

body temperature (physiology)

reptile *volume 11 page 51*

Boer (Dutch-South African people)

Pretoria *volume 10 page 147*

South Africa *volume 12 page 138*

Boer War (British-South African history, 1899-1902)

South Africa *volume 12 page 139*

bog (wetland)

MAIN ARTICLE *volume 2 page 99, picture, volume 2 page 99*

MORE TO EXPLORE

cranberry *volume 3 page 210*

Scotland *volume 12 page 52*

wetland *volume 15 page 36*

Bogong, Mount (mountain in Victoria, Australia)

Victoria *volume 14 page 78*

Bogotá (capital city of Colombia)

MAIN ARTICLE *volume 2 page 99, picture, volume 2 page 100*

MORE TO EXPLORE

Colombia *volume 3 page 152*

Bohemia (historic region in Europe)

Czechoslovakia *volume 3 page 238*

Czech Republic *volume 3 page 240, volume 10 page 142*

boiling (phase change)

water *volume 15 page 23*

Boise (state capital of Idaho, U.S.)

MAIN ARTICLE *volume 2 page 100, picture, volume 2 page 100*

MORE TO EXPLORE

Idaho *volume 6 page 111*

Bojaxhiu, Agnes Gonxha (Roman

Catholic nun): *see in index* Teresa, Mother

Boleyn, Anne (queen of England): *see in index* Anne Boleyn

Bolívar, Simón (Latin American leader)

MAIN ARTICLE *volume 2 page 101, picture, volume 2 page 101*

MORE TO EXPLORE

Bolivia *volume 2 page 103*

Caracas *volume 3 page 36*

South America *volume 12 page 144, picture, volume 12 page 144*

Venezuela *volume 14 page 64*

Bolivia (country in South America)

MAIN ARTICLE *volume 2 page 102*

MORE TO EXPLORE

Bolívar *volume 2 page 101*

geography

La Paz *picture, volume 7 page 108*

Sucre *picture, volume 12 page 198*

llama *picture, volume 2 page 103*

boll (botany)

cotton *volume 3 page 206*

Bollywood (film industry in India)

Mumbai *volume 8 page 204*

Bolshevik (Russian political party)

Lenin *volume 7 page 130*

Nicholas II *volume 9 page 65*

Russia and Soviet Union *volume 11 page 107, volume 14 page 13*

Russian Revolution *volume 11 page 108*

Stalin *volume 12 page 176*

Bolshoi Ballet (Russian ballet company)

ballet *volume 2 page 15*

bomb (weapon)

MAIN ARTICLE *volume 2 page 104, picture, volume 2 page 104, picture, volume 2 page 105*

MORE TO EXPLORE

air force *volume 1 page 52*

army *volume 1 page 190*

military training *picture, volume 3 page 165*

terrorism *volume 13 page 49*

weapon *volume 15 page 26*

Bombay (city in India): *see in index* Mumbai

bombing (military technique)

World War II *picture, volume 15 page 66*

Bonaparte, Napoleon (emperor of France): *see in index* Napoleon I

bond (finance)

stock exchange *volume 12 page 185*

bonding (chemistry)

molecule *volume 8 page 156*

bond paper (grade of paper)

paper *volume 10 page 28*

bone (anatomy)

MAIN ARTICLE *volume 2 page 105*

MORE TO EXPLORE

arm *picture, volume 2 page 106*

fractures *picture, volume 2 page 106*

hand *volume 6 page 12*

bone marrow (anatomy)

bone *volume 2 page 106*

lymphatic system *volume 7 page 191, picture, volume 7 page 189*

“Bonhomme Richard” (U.S. naval ship)

Jones *volume 7 page 32, picture, volume 7 page 32*

Bonn (city in Germany)

MAIN ARTICLE *volume 2 page 107, picture, volume 2 page 107*

bonobo (primate)

MAIN ARTICLE *volume 2 page 107, picture, volume 2 page 108*

MORE TO EXPLORE

apes *volume 1 page 146, picture, volume 1 page 147*

primate *picture, volume 10 page 149*

book (publishing)

MAIN ARTICLE *volume 2 page 108, picture, volume 2 page 108*

MORE TO EXPLORE

“Canterbury Tales” illustration *picture, volume 7 page 161*

censorship *volume 3 page 69*

history by Bede *picture, volume 6 page 64*

bookmaking (publishing)

MAIN ARTICLE *volume 2 page 108*

MORE TO EXPLORE

offset printing *picture, volume 2*

page 109

restoration *picture, volume 2 page 109*

Book of: *see in index under the specific part of the name, for example, Revelation, Book of*

boomerang (weapon and toy)

MAIN ARTICLE *volume 2 page 110, picture, volume 2 page 110*

Boone, Daniel (U.S. frontiersman)

MAIN ARTICLE *volume 2 page 111, picture, volume 2 page 111*

MORE TO EXPLORE

Cumberland Gap *volume 3 page 231*

Kentucky *volume 7 page 57*

Boonesborough (settlement in Kentucky, U.S.)

Boone *volume 2 page 111*

booted eagle (bird)

eagles *volume 4 page 86*

Booth, John Wilkes (U.S. actor and assassin)

- assassination of Lincoln *volume 7*
page 156
- Bora-Bora** (island of the Society Islands, French Polynesia) *picture, volume 5*
page 68
- Borah Peak** (mountain in Idaho, U.S.)
Idaho *volume 6* page 111
- Borghese Gallery** (museum in Rome, Italy)
Rome *volume 11* page 87
- Borlaug, Norman** (U.S. scientist)
Borlaug giving talk *picture, volume 5*
page 159
- Borneo** (island in the Pacific Ocean)
Brunei *volume 2* page 137
- Bornu** (historical province and empire in western Africa)
Kanem-Bornu Empire *volume 7* page 46
- borough** (government district)
New York City *volume 9* page 60
- borrowing** (finance): *see in index* loan
- Bosnia and Herzegovina** (country in Europe)
MAIN ARTICLE *volume 2* page 112
MORE TO EXPLORE
Mostar *picture, volume 2* page 113
Serbia *volume 12* page 72
Yugoslavia *volume 15* page 95
- Bosniac** (European people)
Bosnia and Herzegovina *volume 2*
page 112
- Bosporus** (strait in Turkey)
Dardanelles *volume 4* page 16
Mediterranean Sea *volume 8* page 94
- Boston** (state capital of Massachusetts, U.S.)
MAIN ARTICLE *volume 2* page 114
MORE TO EXPLORE
history
American Revolution *volume 1*
page 99
Attucks *volume 1* page 226
handbill warning of Fugitive Slave Act
picture, volume 5 page 73
Massachusetts *volume 8* page 71
Quincy Market *picture, volume 2*
page 114
- Boston Braves** (baseball team): *see in index* Atlanta Braves
- Boston Marathon** (sports event)
wheelchair participant *picture, volume 8*
page 53
- Boston Massacre** (U.S. history, 1770)
Adams *volume 1* page 23
American Revolution *volume 1* page 99
Attucks *volume 1* page 225
Boston *volume 2* page 114
- Boston Police Strike** (U.S. history, 1919)
Coolidge *volume 3* page 194
- Boston Red Sox** (U.S. baseball team)
2004 World Series *picture, volume 2*
page 30
Ruth *volume 11* page 109
- Boston Tea Party** (U.S. history, 1773)
picture, volume 13 page 22
American Revolution *volume 1* page 99
Boston *volume 2* page 114
Massachusetts *volume 8* page 73
Revere *volume 11* page 57
- botanical garden** (study and exhibition garden)
garden *volume 5* page 87
potato plants *picture, volume 2* page 115
- botany** (study of plants)
MAIN ARTICLE *volume 2* page 115, *picture, volume 2* page 115
- Botswana** (country in Africa)
MAIN ARTICLE *volume 2* page 116
MORE TO EXPLORE
diamonds *picture, volume 5* page 79
geography
Kalahari: *see in index* Kalahari
Okavango River delta *picture, volume 2* page 117
lions in Chobe National Park *picture, volume 2* page 116
- bottlenose dolphin** (mammal)
dolphin *volume 4* page 64
- boulder** (rock)
erosion *picture, volume 4* page 152
orange lichen *picture, volume 7* page 146
- Boulder Dam** (dam in the U.S.): *see in index* Hoover Dam
- Boulevard** (in roadway names)
common abbreviations *table, volume 1*
page 8
- Boundary Peak** (mountain in Nevada, U.S.)
Nevada *volume 9* page 40
- Boundary Waters Canoe Area Wilderness** (conservation area in Minnesota, U.S.)
campsite *picture, volume 8* page 136
- bourgeoisie** (social class)
French Revolution *volume 5* page 69
- bout** (boxing)
boxing *volume 2* page 118
- Bouteflika, Abdelaziz** (president of Algeria)
Algeria *volume 1* page 79
- bow** (watercraft part)
boat *volume 2* page 97, *picture, volume 2*
page 97
ship *volume 12* page 81
- bow** (stringed instrument part)
musical instruments *picture, volume 8*
page 216
- bow and arrow**
archery *volume 1* page 165, *picture, volume 1* page 165
Sioux *picture, volume 12* page 92
war *picture, volume 15* page 9
- bowhead right whale** (mammal)
whale species *picture, volume 15* page 37
- bowl** (tableware)
Celtic artwork *picture, volume 3* page 68
- bowler** (cricket)
cricket *volume 3* page 214, *picture, volume 3* page 214
- Boxer Rebellion** (Chinese history, 1900)
China *volume 3* page 104
- boxing** (sport)
MAIN ARTICLE *volume 2* page 118, *picture, volume 2* page 118
MORE TO EXPLORE
Ali and Terrell *picture, volume 1* page 82
measurements of Liston and Ali *table, volume 12* page 183
- box turtle** (reptile)
images
eastern box turtle *picture, volume 11*
page 53
front limb *picture, volume 1* page 182
- boycott**
Montgomery bus boycott *picture, volume 8* page 177
- Boyle, Robert** (British scientist)
chemistry *volume 3* page 87

Boy Scouts of America (youth organization)

scouting *volume 12 page 54*

Cub Scout gathering newspapers for recycling *picture, volume 12 page 53*

Brachiosaurus (dinosaur)

MAIN ARTICLE *volume 2 page 119, picture, volume 2 page 119*

MORE TO EXPLORE

dinosaur *picture, volume 4 page 53*

bracken (fern)

fern *volume 5 page 12*

bracket fungus (organism) *picture, volume 5 page 75*

Braddock, Edward (British commander)

Fort Duquense retreat, 1755 *picture, volume 5 page 66*

Bradstreet, Anne (colonial American poet)

MAIN ARTICLE *volume 2 page 120, picture, volume 2 page 120*

Brahma (Hindu god)

Hinduism *volume 6 page 56*

sculpture figure *picture, volume 14 page 60*

Brahman (breed of cattle)

cattle *volume 3 page 62*

Brahman (Hindu concept)

Hinduism *volume 6 page 56*

Brahmana (Hindu literature)

Veda *volume 14 page 60*

Brahmi (writing system)

alphabet *volume 1 page 89*

Brahms, Johannes (German composer)

classical music *volume 3 page 132*

Braille (writing system)

MAIN ARTICLE *volume 2 page 121, picture, volume 2 page 121*

MORE TO EXPLORE

blindness *volume 2 page 91*

Braille, Louis (French educator)

Braille *volume 2 page 121*

brain (anatomy)

MAIN ARTICLE *volume 2 page 121*

MORE TO EXPLORE

death *volume 4 page 22*

mammals *volume 8 page 36*

human skull comparison *picture, volume 6 page 95*

primate *volume 10 page 148*

medical disorders

Alzheimer's disease *volume 1 page 91*

cerebral palsy *volume 3 page 77*

encephalitis *volume 4 page 132, picture, volume 4 page 133*

epilepsy *volume 4 page 146*

meningitis *volume 8 page 99*

Parkinson's disease *volume 10 page 35*

nervous system *volume 9 page 34, picture, volume 9 page 35, picture, volume 9 page 36*

vertebrate brains *picture, volume 2 page 122*

brain death (physiology)

death *volume 4 page 22*

brain stem (anatomy)

brain *volume 2 page 122, picture, volume 2 page 122*

brake (machine component)

automobile *picture, volume 1 page 235*

bicycle *volume 2 page 69*

motorcycle *volume 8 page 192*

bran (grain seed part)

grain *volume 5 page 134*

"Brandenburg Concertos" (compositions by Bach)

Bach *volume 2 page 4*

Brandenburg Gate (gate in Berlin, Germany) *picture, volume 2 page 62*

Brandywine, Battle of the (U.S. history)

Pulaski *volume 10 page 166*

Brant, Joseph (Mohawk chief) *picture, volume 8 page 152*

Iroquois *volume 6 page 160*

Braque, Georges (French artist)

Picasso *volume 10 page 80*

Brasília (capital city of Brazil)

MAIN ARTICLE *volume 2 page 123, picture, volume 2 page 123*

MORE TO EXPLORE

Brazil *volume 2 page 125*

brass (metal alloy)

MAIN ARTICLE *volume 2 page 123, picture, volume 2 page 124*

MORE TO EXPLORE

alloy *volume 1 page 87*

brass instrument (music) *picture, volume 8 page 217*

brass *volume 2 page 123*

modern orchestra seating arrangement *picture, volume 9 page 145*

musical instruments *volume 8 page 216*

orchestra *volume 9 page 145*

Bratislava (capital city of Slovakia)

MAIN ARTICLE *volume 2 page 124, picture, volume 2 page 124*

MORE TO EXPLORE

Slovakia *volume 12 page 109*

Brazil (country in South America)

MAIN ARTICLE *volume 2 page 125*

MORE TO EXPLORE

geography

Amazon River *volume 1 page 91*

Pantanal *picture, volume 2 page 126*

history

abolitionist movement *volume 1 page 11*

Dias *volume 4 page 45*

timeline *volume 2 page 125*

people and culture

Carnival in Rio de Janeiro *picture, volume 2 page 127*

tree replanting *picture, volume 3 page 187*

women's soccer team *picture, volume 9 page 13*

Brazzaville (capital city of the Republic of the Congo)

MAIN ARTICLE *volume 2 page 128, picture, volume 2 page 128*

MORE TO EXPLORE

Republic of the Congo *volume 3 page 181*

bread (food)

fermentation *volume 5 page 11*

break-dance (dance)

hip-hop *volume 6 page 59*

Breakers, The (mansion in Newport, Rhode Island) *picture, volume 11 page 61*

breaststroke (swimming)

swimming *volume 12 page 215*

breathing (physiology) *picture, volume 11 page 56*

breed (biology)

dog *volume 4 page 63, picture, volume 4 page 61, table, volume 4 page 62*

poultry *volume 10 page 140*

Brenner Pass (mountain pass in Europe)
Austria *volume 1 page 233*

brick (building material)

MAIN ARTICLE *volume 2 page 128, picture, volume 2 page 129*

MORE TO EXPLORE

adobe *volume 1 page 29*
architecture *volume 1 page 168*
ivy *picture, volume 6 page 175*

Brickyard, the (racetrack in Indianapolis, Indiana, U.S.): *see in index* Indianapolis Motor Speedway

bridge (transportation structure)

MAIN ARTICLE *volume 2 page 130, picture, volume 2 page 130*

MORE TO EXPLORE

Hartland *picture, volume 9 page 43*
Prague *picture, volume 10 page 142*

“Bridge to Terabithia” (work by Paterson)
literature for children *volume 7 page 164*

Bridgetown (capital city of Barbados)

MAIN ARTICLE *volume 2 page 131*

MORE TO EXPLORE

Barbados *volume 2 page 27*

Brisbane (capital city of Queensland, Australia)
Queensland *volume 11 page 10*

bristlecone pine (tree)
conifer *volume 3 page 183*

Britain (ancient and early medieval region)
Arthurian legend *volume 1 page 193*
Hadrian's Wall *picture, volume 4 page 131*

Britain, Battle of (European history)
World War II *volume 15 page 67*

British Broadcasting Corporation
telecommunication *volume 13 page 34*

British Columbia (province in Canada)

MAIN ARTICLE *volume 2 page 132*

MORE TO EXPLORE

Coast Mountains *picture, volume 2 page 133*

British East India Company (British trading company): *see in index* East India Company

British Empire (history of the United Kingdom) *map, volume 4 page 131*

Africa

Botswana *volume 2 page 117*
Gambia, The *volume 5 page 84*
Banjul *volume 2 page 23*
Ghana *volume 5 page 111*
Kenya *volume 7 page 59*
Nairobi *volume 9 page 5*
Lesotho *volume 7 page 134*
Malabo *volume 8 page 24*
Malawi *volume 8 page 26*
Nigeria *volume 9 page 69*
Sierra Leone *volume 12 page 85*
Freetown *volume 5 page 65*
Somalia *volume 12 page 131*
South Africa *volume 12 page 138*
Sudan *volume 12 page 200*
Swaziland *volume 8 page 85, volume 12 page 211*
Tanzania *volume 13 page 16*
Zambia
Lusaka *volume 7 page 185*
Zimbabwe
Harare *volume 6 page 16*

Asia

Bangladesh *volume 2 page 22*
Brunei *volume 2 page 137*
China
Hong Kong *volume 6 page 78, picture, volume 4 page 132*
India *volume 6 page 124*
Delhi *volume 4 page 32*
Mughal Empire *volume 8 page 202*
Mumbai *volume 8 page 204*
Nehru *volume 9 page 30*
Malaysia *volume 8 page 28*
Myanmar *volume 8 page 221*
Yangon *volume 15 page 86*
Pakistan *volume 10 page 14*
Sri Lanka *volume 12 page 175*
Colombo *volume 3 page 154*

empire *volume 4 page 132*

Guyana *volume 5 page 173*
Georgetown *volume 5 page 100*

Indian Ocean

Maldives *volume 8 page 30*
Mauritius *volume 8 page 80*
Seychelles *volume 12 page 74, volume 14 page 79*

Mediterranean

Cyprus *volume 3 page 237*
Gibraltar *volume 5 page 114*

Greece

Acropolis *volume 1 page 20*

Malta *volume 8 page 34, volume 14 page 52*

Middle East *volume 8 page 125*

Arabian Peninsula *volume 1 page 157*

Bahrain *volume 2 page 9*

Egypt *volume 4 page 111*

Iraq *volume 6 page 153*

Israel *volume 6 page 169*

Kuwait *volume 7 page 91*

Palestine *volume 10 page 19*

United Arab Emirates *volume 14 page 15*

North America

Bermuda *volume 2 page 62*

Canada

Canada Day *volume 3 page 27*

Newfoundland *volume 9 page 46*

North America *volume 9 page 83*

Pacific

Australia *volume 1 page 231*

South Australia *volume 12 page 146*

Sydney *volume 12 page 221, picture, volume 3 page 155*

Tasmania *volume 13 page 20*

Victoria *volume 14 page 78*

Western Australia *volume 15 page 31*

Fiji *volume 5 page 19*

Kiribati *volume 7 page 71*

New Zealand *volume 9 page 62*

Wellington *volume 15 page 29*

Solomon Islands *volume 12 page 129*

Tonga *volume 13 page 79*

Tuvalu *volume 13 page 121*

Vanuatu *volume 14 page 58*

United Kingdom *volume 14 page 21*

West Indies and Central America *volume 3 page 76*

Antigua and Barbuda *volume 1 page 143*

Bahamas *volume 2 page 8*

Nassau *volume 9 page 12*

Barbados *volume 2 page 27, volume 2 page 131*

Belize *volume 2 page 57*

Dominica *volume 4 page 65*

Jamaica *volume 7 page 10*

Kingston *volume 7 page 69*

Saint Kitts and Nevis *volume 12 page 12*

Saint Vincent and the Grenadines *volume 12 page 18*

Trinidad and Tobago *volume 13 page 97*

British Leeward Islands (historical British colony in the West Indies)

- Antigua and Barbuda *volume 1*
page 143
- British Museum** (museum in London, England)
museum *volume 8* *page 211*
- British Somaliland** (historical region in Somalia)
Somalia *volume 12* *page 131*
- Briton** (people)
Wales *volume 15* *page 5*
- broadcasting** (telecommunications)
television transmission *picture, volume 13* *page 40*
- broad jump** (athletics): *see in index* long jump
- broad-leaved tree**
tree *volume 13* *page 94*
- broccoli** (vegetable)
cabbage *volume 3* *page 4*
- bronchiole** (anatomy)
lung *volume 7* *page 184*, *picture, volume 7* *page 184*
- bronchus** (anatomy)
lung *volume 7* *page 184*, *picture, volume 7* *page 184*
respiratory system *volume 11* *page 55*
- Brontosaurus** (herbivorous dinosaur): *see in index* Apatosaurus
- Bronx** (borough in New York City, New York, U.S.)
New York City *volume 9* *page 60*
- bronze** (alloy)
MAIN ARTICLE *volume 2* *page 134*, *picture, volume 2* *page 135*
MORE TO EXPLORE
alloy *volume 1* *page 87*
metal *volume 8* *page 106*
sculpture *picture, volume 2* *page 134*
- Bronze Age** (prehistoric period)
MAIN ARTICLE *volume 2* *page 134*
MORE TO EXPLORE
Stone Age *volume 12* *page 189*
technology and invention *volume 13* *page 25*
- Brooklyn** (borough in New York City, New York, U.S.)
New York City *volume 9* *page 60*
- Brooklyn Dodgers** (U.S. baseball team):
see in index Dodgers
- Brooks, Gwendolyn** (U.S. poet and educator)
MAIN ARTICLE *volume 2* *page 135*, *picture, volume 2* *page 135*
- Broughton, Jack** (British boxer)
boxing *volume 2* *page 119*
- Brown, John** (U.S. abolitionist)
MAIN ARTICLE *volume 2* *page 136*, *picture, volume 2* *page 136*
MORE TO EXPLORE
capture at Harper's Ferry *picture, volume 6* *page 19*
Harpers Ferry *volume 6* *page 19*
Kansas-Nebraska Act *volume 7* *page 49*
Lee *volume 7* *page 122*
- brown bear** (mammal) *picture, volume 2* *page 42*
bear *volume 2* *page 41*
- Brown County State Park** (park in Nashville, Indiana, U.S.) *picture, volume 6* *page 127*
- brown-headed cowbird** (bird) *picture, volume 3* *page 209*
cowbirds *volume 3* *page 209*
- brown hyena** (mammal)
hyena *volume 6* *page 104*
- brown mustard** (plant and condiment)
mustard *volume 8* *page 219*
- brown pelican** (bird) *picture, volume 10* *page 51*
bill structure and eating habits *picture, volume 2* *page 77*
pelican *volume 10* *page 51*
- brown recluse** (spider)
spider *volume 12* *page 165*
- brown rice** (cereal)
rice *volume 11* *page 63*
- brown trout** (fish)
trout *volume 13* *page 99*
- Brown versus Board of Education of Topeka** (law case)
civil rights movement *volume 3* *page 129*
Marshall *volume 8* *page 61*
National Association for the Advancement of Colored People *volume 9* *page 14*
- Brugge** (city in Belgium) *picture, volume 2* *page 55*
- Brûlé, Étienne** (Canadian explorer)
Ontario *volume 9* *page 140*
- Brunei** (country in Southeast Asia)
MAIN ARTICLE *volume 2* *page 137*
MORE TO EXPLORE
mosque *picture, volume 2* *page 20*
- Brussels** (capital city of Belgium)
MAIN ARTICLE *volume 2* *page 138*, *picture, volume 2* *page 138*
MORE TO EXPLORE
Belgium *volume 2* *page 54*
- brussels sprouts** (vegetable)
cabbage *volume 3* *page 4*
- Brutus, Marcus Junius** (Roman politician)
Caesar *volume 3* *page 8*
- Bryan, John Neely** (U.S. lawyer and pioneer)
Dallas *volume 4* *page 8*
- Bryan, William Jennings** (U.S. politician)
Lincoln *volume 7* *page 154*
- Bryce Canyon National Park** (national park in Utah, U.S.)
land formations *picture, volume 14* *page 45*
- bubo** (medical disorder)
plague *volume 10* *page 92*
- bubonic plague** (disease)
plague *volume 10* *page 92*
- Buchanan, James** (president of the U.S.)
MAIN ARTICLE *volume 2* *page 138*, *picture, volume 2* *page 139*
MORE TO EXPLORE
timeline *volume 2* *page 138*
- Bucharest** (capital city of Romania)
MAIN ARTICLE *volume 2* *page 140*, *picture, volume 2* *page 140*
MORE TO EXPLORE
Romania *volume 11* *page 84*
- Buckeye State** (state in the U.S.): *see in index* Ohio
- Buckingham Palace** (palace in London, United Kingdom) *picture, volume 14* *page 18*

Budapest (capital city of Hungary)

MAIN ARTICLE *volume 2 page 141*, *picture, volume 2 page 141*

MORE TO EXPLORE

folk musicians *picture, volume 5 page 41*

Hungary *volume 6 page 100*

Parliament building *picture, volume 6 page 100*

Buddha (founder of Buddhism)

MAIN ARTICLE *volume 2 page 142*, *picture, volume 2 page 142*

MORE TO EXPLORE

Buddha's enlightenment *picture, volume 2 page 144*

Buddhism *volume 2 page 143*

statue and sculptures *picture, volume 13 page 9*

Buddhism (religion)

MAIN ARTICLE *volume 2 page 143*

MORE TO EXPLORE

art and architecture

monastery

Bhutan *picture, volume 2 page 66*

temple *volume 13 page 42*

Bangkok *picture, volume 13 page 42*

Bodh Gaya *picture, volume 8 page 81*

Kiyomizu Temple *picture, volume 1 page 203*

Myanmar *picture, volume 8 page 221*

That Luang temple *picture, volume 14 page 83*

beliefs and practices

Buddha *volume 2 page 142*

martial arts *volume 8 page 64*

monk *volume 8 page 166*, *picture, volume 2 page 143*, *picture, volume 2 page 144*

pilgrimage *volume 10 page 85*

saint *volume 12 page 9*

history

Mauryan Empire *volume 8 page 81*

Vietnam War *volume 14 page 87*

major world religions *table, volume 11 page 43*

Shinto *volume 12 page 81*

budding (reproduction)

coral *volume 3 page 197*

hydra *volume 6 page 104*, *picture, volume 6 page 104*

reproductive system *volume 11 page 47*

Buena Vista, Battle of (Mexican War, 1847)

Davis *volume 4 page 18*

Taylor *volume 13 page 23*, *picture, volume 8 page 109*

Buenos Aires (capital city of Argentina)

MAIN ARTICLE *volume 2 page 145*

MORE TO EXPLORE

Argentina *volume 1 page 175*

Plaza de la República *picture, volume 2 page 145*

buffalo (Asian and African mammal)

MAIN ARTICLE *volume 2 page 146*, *picture, volume 2 page 146*

buffalo, American (mammal): *see in index* American bison

Buffalo Bill (U.S. showman)

MAIN ARTICLE *volume 3 page 148*, *picture, volume 3 page 148*

MORE TO EXPLORE

Pony Express *volume 10 page 125*

Buffalo Bill's Wild West and Congress of Rough Riders of the World (popular entertainment): *see in index* Wild West show

bug (animal): *see in index* centipede; insect; spider; tick

bugaku (Japanese dance)

dance *volume 4 page 13*

Buganda (East African kingdom)

Uganda *volume 14 page 5*

building (structure)

architecture *volume 1 page 167*

building construction

working with concrete *picture, volume 3 page 68*, *picture, volume 3 page 176*

Bujumbura (capital city of Burundi)

MAIN ARTICLE *volume 2 page 147*

MORE TO EXPLORE

Burundi *volume 2 page 153*

traditional dance *picture, volume 2 page 147*

bulb (plant part)

garlic *picture, volume 5 page 90*

Bulgar (people)

Bulgaria *volume 2 page 149*

Bulgaria (country in Europe)

MAIN ARTICLE *volume 2 page 148*

MORE TO EXPLORE

geography

Alexander Nevsky Cathedral *picture, volume 12 page 122*

Balkan Mountains *picture, volume 2 page 149*

boulevard in Varna *picture, volume 2 page 148*

World War I *volume 15 page 63*

Bulgarians (people): *see in index* Bulgar

Bulge, Battle of the (World War II)

World War II *volume 15 page 69*

bulimia (eating disorder)

mental illness *volume 8 page 101*

bulkhead (watercraft part)

boat *volume 2 page 97*

bull (cattle)

cattle *volume 3 page 61*

bulldog (breed of dog) *picture, volume 4*

page 55

non-sporting dogs *table, volume 4 page 62*

bulletproof vest (armor)

armor *volume 1 page 187*

bullfrog (amphibian) *picture, volume 5*

page 71

Bull Run, Battle of (U.S. history, 1861)

American Civil War *volume 1 page 96*

bull terrier (breed of dog)

terrier breeds *table, volume 4 page 62*

bumblebee (insect)

bee *volume 2 page 45*

Bunche, Ralph (U.S. diplomat)

MAIN ARTICLE *volume 2 page 150*

bunker (golf)

golf *volume 5 page 125*

Bunker Hill, Battle of (American Revolution, 1775)

American Revolution *volume 1 page 100*

Bunraku (Japanese puppet theater) *picture, volume 13 page 59*

drama *volume 4 page 74*

theater *volume 13 page 59*

Bunyan, Paul (legendary lumberjack)

MAIN ARTICLE *volume 2 page 150*, *picture, volume 2 page 150*

buoy (flotation device)

lighthouse *volume 7 page 150*

burakumin (Japanese social class)

Japan *volume 7 page 13*

Burchell's zebra (mammal)
zebras *volume 15 page 102*

burial (death rite)
death *volume 4 page 22*

burial mound (anthropology)
Adena culture *picture, volume 1 page 29*
mound builders *volume 8 page 194*

Burkina Faso (country in Africa)
MAIN ARTICLE *volume 2 page 151, picture, volume 2 page 151*

Burma (country in Asia): *see in index*
Myanmar

Burman (people)
Myanmar *volume 8 page 221*

burn (injury)
MAIN ARTICLE *volume 2 page 152*

Burr, Aaron (vice president of the U.S.)
Hamilton *volume 6 page 11*
Jefferson *volume 7 page 18*

burrow (zoology)
rabbit *picture, volume 11 page 14*

Burundi (country in Africa)
MAIN ARTICLE *volume 2 page 153*
MORE TO EXPLORE
drummers *picture, volume 2 page 153*
traditional dance *picture, volume 2 page 147*

bush (region in Australia): *see in index*
Outback

Bush, Barbara (first lady of the U.S.)
Bush, George *volume 2 page 154*

Bush, George (president of the U.S.)
MAIN ARTICLE *volume 2 page 154, picture, volume 2 page 154*
MORE TO EXPLORE
Bush, George W. *volume 2 page 155*
timeline *volume 2 page 154*

Bush, George W. (president of the U.S.)
MAIN ARTICLE *volume 2 page 155, picture, volume 2 page 156*
MORE TO EXPLORE
Bush, George *volume 2 page 155*
electoral college *volume 4 page 120*
Alabama certificate of vote *picture, volume 4 page 119*
Powell *volume 10 page 141*
timeline *volume 2 page 155*

Bush, Jeb (U.S. politician)
Bush, George *volume 2 page 155*

Bush, Laura Welch (first lady of the U.S.)
Bush, George W. *volume 2 page 156*

Bushido (Japanese code of ethics)
samurai *volume 12 page 25*

Bushmen (people): *see in index* San

Bushnell, David (U.S. inventor)
submarine *volume 12 page 197, picture, volume 12 page 197*

bush pig (mammal) *picture, volume 10 page 83*

business (economics)
manufacturing *volume 8 page 46*
retail competition *picture, volume 3 page 34*
spy *volume 12 page 169*

Butcher, Susan (U.S. sled-dog racer)
Iditarod *volume 6 page 113*

butterfly (insect)
MAIN ARTICLE *volume 2 page 157*
MORE TO EXPLORE
mimicry *volume 8 page 130*
monarch butterfly *picture, volume 2 page 158*

butterfly stroke (swimming)
swimming *volume 12 page 215*

Buyid dynasty (Islamic history)
Caliphate *volume 3 page 15*

buzzard (bird)
common buzzard *picture, volume 2 page 80*

By, John (British engineer)
Ottawa *volume 9 page 155*

Byrd, Richard E. (U.S. explorer)
polar exploration *volume 10 page 111*

Bytown (settlement in Ontario, Canada):
see in index Ottawa

Byzantine Empire (historic empire in Eurasia)
MAIN ARTICLE *volume 2 page 159, picture, volume 2 page 159*

MORE TO EXPLORE
architecture *volume 1 page 169*
history
ancient Rome *volume 11 page 91*
Crusades *volume 3 page 223*
Eastern Orthodox Churches *volume 4 page 94*
Egypt *volume 4 page 115*

Greece *volume 5 page 152*
Ottoman Empire *volume 9 page 156*
tsar *volume 13 page 103*
Turkey *volume 13 page 112*

Byzantium (historic city in Turkey): *see in index* Istanbul



C (temperature scale): *see in index* Celsius

cabbage (plant)
MAIN ARTICLE *volume 3 page 4*

cabinet (government department heads)
Parliament *volume 10 page 37*
United States government *volume 14 page 35*
major executive departments *table, volume 14 page 35*

cable car (transportation)
Queenstown *picture, volume 9 page 62*

cable-stayed bridge (transportation structure)
bridge *volume 2 page 130, picture, volume 2 page 130*

cable television (broadcasting)
transmission *picture, volume 13 page 40*

Cabot, John (Italian explorer)
MAIN ARTICLE *volume 3 page 4*
MORE TO EXPLORE
discovery, exploration, and settlement of the Americas *volume 1 page 103*
Canada *volume 3 page 25, picture, volume 3 page 5*
Newfoundland and Labrador *volume 9 page 46, picture, volume 1 page 103*
Nova Scotia *volume 9 page 102*
Prince Edward Island *volume 10 page 151*

Cabot Strait (strait in Canada)
Saint Lawrence River and Seaway *volume 12 page 13*

Cabral, Pedro Álvares (Portuguese explorer and navigator)
Brazil *volume 2 page 127*
Dias *volume 4 page 45*

Cabrillo, Juan Rodríguez (Portuguese explorer)
California *volume 3 page 13*

cacao (tree)
chocolate *volume 3 page 108*

cactus (plant)
MAIN ARTICLE *volume 3 page 5, picture, volume 3 page 5, picture, volume 3 page 6*

MORE TO EXPLORE
Tonto National Forest in Arizona *picture, volume 10 page 75*

Caddo (Native American people)
MAIN ARTICLE *volume 3 page 6, picture, volume 3 page 7*

caecilian (amphibian order) *picture, volume 1 page 110*
amphibian *volume 1 page 110*

Caerdydd (city in Wales, United Kingdom): *see in index* Cardiff

Caesar, Julius (Roman ruler)
MAIN ARTICLE *volume 3 page 7*
MORE TO EXPLORE
ancient Rome *volume 11 page 90*
Augustus *volume 1 page 227*
calendar *volume 3 page 10*
Cleopatra *volume 3 page 134*
dictatorship *volume 4 page 46*
English Channel *volume 4 page 142*
marble bust *picture, volume 3 page 7*

Caesar Augustus (Roman emperor): *see in index* Augustus

Cahokia Mounds (archaeological site in Illinois, U.S.)
mound builders *volume 8 page 194*

Cairo (capital city of Egypt)
MAIN ARTICLE *volume 3 page 8, picture, volume 3 page 9*
MORE TO EXPLORE
Egypt *volume 4 page 109*
Muslims in prayer *picture, volume 4 page 110*
street market *picture, volume 1 page 159*

Cajun (United States ethnic group)
Louisiana *volume 7 page 180*

Calatrava, Santiago (Spanish architect)
Milwaukee Art Museum *picture, volume 15 page 53*

calcium (chemical element)
endocrine system *volume 4 page 135*

food and nutrition *volume 5 page 44*
calcium carbonate (chemical compound)
exoskeleton *volume 4 page 173*
shell *volume 12 page 79*

Calcutta (city in India)
children celebrate Holi festival *picture, volume 6 page 57*

Caldecott Medal (literary award)
literature for children *volume 7 page 163, picture, volume 7 page 162, picture, volume 7 page 162*

caldera (landform)
volcano *volume 14 page 101, picture, volume 14 page 101*

calendar
MAIN ARTICLE *volume 3 page 9*
MORE TO EXPLORE
Jewish calendar *picture, volume 3 page 10*
Maya *volume 8 page 82*
time *volume 13 page 69*

Calgary (city in Alberta, Canada) *picture, volume 1 page 70*

calico (animal coloration)
cat *volume 3 page 56*

California (state in the U.S.)
MAIN ARTICLE *volume 3 page 11*
MORE TO EXPLORE
apricot *volume 1 page 154*
geography

Big Sur coastline *picture, volume 3 page 12*
Death Valley National Park *picture, volume 12 page 27*
Devil's Postpile *picture, volume 11 page 75*
San Diego Zoo *picture, volume 15 page 107, picture, volume 15 page 108*
Sequoia National Park *picture, volume 5 page 113*
State Capitol *picture, volume 5 page 133, picture, volume 12 page 5*
Yosemite Falls *picture, volume 14 page 24*

history
gold rush: *see in index* California Gold Rush
Serra *volume 12 page 73*
Spanish missions *volume 8 page 140, table, volume 8 page 140*
Taylor *volume 13 page 23*

people and culture
Asian Americans *volume 1 page 206*
immigrant languages *picture, volume 7 page 105*
Native Americans
Pomo *volume 10 page 120*
windmills *picture, volume 15 page 50*

California condor (bird) *picture, volume 4 page 133*
chick at zoo *picture, volume 15 page 108*
vulture *volume 14 page 106*

California Gold Rush (U.S. history)
California *volume 3 page 13*
gold rush *volume 5 page 123*
Miwok *volume 8 page 150*
Pomo *volume 10 page 120*
Sacramento *volume 12 page 5*
Sierra Nevada *volume 12 page 86*

Californian Indian (Native American people)
Native Americans *volume 9 page 18*

California poppy (plant and flower) *picture, volume 10 page 126*

California State Capitol (government building in Sacramento, California)
picture, volume 5 page 133

caliph (Islamic title)
Caliphate *volume 3 page 14*

Caliphate (Islamic history)
MAIN ARTICLE *volume 3 page 14*
MORE TO EXPLORE
Abu Bakr *volume 1 page 15*
Baghdad *volume 2 page 6*
Umayyad caliph on gold coin *picture, volume 3 page 14*

call and response (music)
gospel music *volume 5 page 130*

Callao (port in Peru)
Lima *volume 7 page 151*

calligraphy (artistic handwriting)
MAIN ARTICLE *volume 3 page 15, picture, volume 3 page 15*

Callisto (moon of Jupiter)
Jupiter *volume 7 page 41*

call number (library science)
library *volume 7 page 142*

calorie (unit of measurement)
food and nutrition *volume 5 page 43*

Calvin, John (French theologian)

MAIN ARTICLE *volume 3 page 16, picture, volume 3 page 16*

MORE TO EXPLORE

Huguenots *volume 6 page 92*

Reformation *volume 11 page 39*

calving (glacier cycle)

iceberg *volume 6 page 107*

Calvinism (Christianity)

Calvin *volume 3 page 16*

calyx (botany)

flower *volume 5 page 38*

parts of a flower *picture, volume 5 page 38*

Cambodia (country in Southeast Asia)

MAIN ARTICLE *volume 3 page 17*

MORE TO EXPLORE

geography

Angkor Wat *volume 1 page 120*

rice paddy *picture, volume 3 page 18*

Royal Palace *picture, volume 10 page 74*

Vietnam *volume 14 page 85*

Cambridge (city in Massachusetts, U.S.)

Harvard University *picture, volume 8 page 73*

camcorder (electronic device) *picture,*

volume 14 page 80

video recording *volume 14 page 80*

Camden (city in Maine, U.S.) *picture,*

volume 8 page 23

Cameahwait (Shoshone leader)

Sacagawea *volume 12 page 4*

camel (mammal)

MAIN ARTICLE *volume 3 page 19, picture, volume 3 page 19, picture, volume 3 page 19*

MORE TO EXPLORE

transportation *picture, volume 4 page 110*

camel racing (sport)

King's Camel Race in Riyadh *picture, volume 12 page 44*

preparing for a camel race *picture, volume 14 page 15*

camera (photography)

MAIN ARTICLE *volume 3 page 20*

MORE TO EXPLORE

photography *volume 10 page 77*

camera obscura (photography)

camera *volume 3 page 20*

Cameroon (country in Africa)

MAIN ARTICLE *volume 3 page 22*

MORE TO EXPLORE

rain forest *picture, volume 11 page 23*

camouflage (biological coloration): *see in*

index protective coloration

Camp, Walter (U.S. football coach)

football *volume 5 page 50*

campaign (politics)

voting *volume 14 page 105*

Campanella, Roy (U.S. baseball player)

Campanella, Doby, Newcombe, and Robinson *picture, volume 2 page 32*

Campbell, Clive (U.S. deejay): *see in*

index Kool Herc

Camp David Accords (Egyptian-Israeli

peace agreements)

Carter *volume 3 page 47*

Israel *volume 6 page 170*

Canaan (historic region in the Middle East)

Judaism *volume 7 page 38*

Moses *volume 8 page 188*

Palestine *volume 10 page 18*

Canada (country in North America)

MAIN ARTICLE *volume 3 page 23*

MORE TO EXPLORE

geography

Arctic regions

aurora over northern Canada *picture, volume 1 page 227*

polar bear *picture, volume 2 page 42*

polar bear on Hudson Bay ice *picture, volume 8 page 45*

Banff National Park *picture, volume 3 page 23*

Calgary *picture, volume 1 page 70*

Coast Mountains *picture, volume 2 page 133*

Great Lakes *volume 5 page 147*

Hudson Bay *volume 6 page 90*

North America *volume 9 page 79*

Prince Edward Island *picture, volume 10 page 151*

Saint Lawrence River and Seaway *volume 12 page 13*

Sault Sainte Marie canals *volume 12 page 47*

Yukon River *picture, volume 15 page 98*

history

Cabot *volume 3 page 5, picture, volume 3 page 5*

prime ministers *table, volume 3 page 26*

timeline *volume 3 page 25*

War of 1812 *volume 15 page 13*

people and culture

Canada Day *picture, volume 3 page 27*

House of Commons *picture, volume 10 page 37*

ice hockey *volume 6 page 69*

national anthem *volume 9 page 13*

Thanksgiving *volume 13 page 56*

Veterans Day *volume 14 page 74*

Canada Day (holiday)

MAIN ARTICLE *volume 3 page 27, picture, volume 3 page 27*

Canada East (historical region in

Canada): *see in index* Quebec

Canada goose (bird) *picture, volume 5*

page 127

goose *volume 5 page 127*

Canada West (historical region in

Canada): *see in index* Ontario

Canadian Pacific Railway

Alberta *volume 1 page 70*

Canadian Rockies (mountain range in

Canada): *see in index* Rocky Mountains

Canaima, Parque Nacional (park in

Venezuela)

national parks *volume 9 page 15*

canal (waterway)

MAIN ARTICLE *volume 3 page 27*

MORE TO EXPLORE

Amsterdam *volume 1 page 112*

Brugge *picture, volume 2 page 55*

locks *picture, volume 3 page 28*

Saint Lawrence River and Seaway *volume 12 page 13*

transportation *volume 13 page 93*

Venice *volume 14 page 65, picture, volume 3 page 28*

Canal Zone (region in Panama)

Panama *volume 10 page 22*

Panama Canal *volume 10 page 23*

canary (bird)

MAIN ARTICLE *volume 3 page 28, picture, volume 3 page 29*

MORE TO EXPLORE

finch *volume 5 page 21*

Canary Islands (islands of Spain in Atlantic Ocean)
Spain *volume 12 page 153*

Canberra (capital city of Australia)

MAIN ARTICLE *volume 3 page 29, picture, volume 3 page 29*

MORE TO EXPLORE

Australia *volume 1 page 229*

New South Wales *volume 9 page 53*

Cancer (astronomy)

constellation *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

cancer (disease)

MAIN ARTICLE *volume 3 page 30*

MORE TO EXPLORE

human disease *volume 4 page 57*

mutation *volume 8 page 220*

radiation *volume 11 page 17*

tumor development *picture, volume 3 page 30*

Cancer, Tropic of (geography)

tropics *volume 13 page 98*

candidate (politician)

voting *volume 14 page 105*

Candra Gupta I (emperor of India)

Mauryan Empire *volume 8 page 81*

cannibalism (human)

Carib *volume 3 page 40*

cannon (weapon)

brass *volume 2 page 124*

Gettysburg National Military Park *picture, volume 10 page 57*

weapon *volume 15 page 25*

canoe (watercraft)

boat *volume 2 page 98, picture, volume 2 page 98*

Iroquois *picture, volume 6 page 160*

canopy (forests)

rain forest *volume 11 page 23, picture, volume 11 page 24*

Canova, Antonio (Italian sculptor)

sculpture *volume 12 page 57*

cantaloupe (fruit)

melon *picture, volume 8 page 97*

“Canterbury Tales, The” (book by Chaucer)

illustration of characters *picture, volume 7 page 161*

literature *volume 7 page 161*

cantilever bridge

bridge *volume 2 page 130, picture, volume 2 page 130*

canyon (landform)

MAIN ARTICLE *volume 3 page 31, picture, volume 3 page 31, picture, volume 3 page 32*

MORE TO EXPLORE

valley *volume 14 page 53*

Cape Breton Highlands National Park

(park on Cape Breton Island, Nova Scotia, Canada)

highlands view *picture, volume 9 page 102*

Cape buffalo (mammal)

buffalo *volume 2 page 146*

Cape Cod (peninsula in Massachusetts, U.S.): *see in index* Cod, Cape**Cape Colony** (British colony in South Africa)

South Africa *volume 12 page 139*

Cape Enrage Lighthouse (lighthouse in New Brunswick, Canada) *picture, volume 9 page 42***Cape Hatteras National Seashore**

(coastal area, North Carolina, U.S.)
sand dunes on Hatteras Island *picture, volume 9 page 86*

Cape May (city in New Jersey, U.S.)

brightly painted houses *picture, volume 9 page 50*

Cape of Storms (promontory of South Africa): *see in index* Good Hope, Cape of**Cape Town** (legislative capital city of South Africa)

MAIN ARTICLE *volume 3 page 32, picture, volume 3 page 32*

MORE TO EXPLORE

children pose near painting *picture, volume 1 page 40*

South Africa *volume 12 page 137*

Cape Verde (island country in the Atlantic Ocean)

MAIN ARTICLE *volume 3 page 33, picture, volume 3 page 33*

capillary (anatomy)

cardiovascular system *volume 3 page 38, picture, volume 3 page 38, picture, volume 3 page 40*

respiratory system *volume 11 page 55, picture, volume 11 page 55*

capital (economic factor)

economics *volume 4 page 100*

capitalism (economic system)

MAIN ARTICLE *volume 3 page 34*

MORE TO EXPLORE

business competition *picture, volume 3 page 34*

communism *volume 3 page 167*

economics *volume 4 page 101*

socialism *volume 12 page 119*

capital punishment (law)

MAIN ARTICLE *volume 3 page 35, picture, volume 3 page 35*

Capitol, United States (building in Washington, D.C., U.S.) *picture, volume 15 page 18*

nighttime view of Washington, D.C.

picture, volume 14 page 24

Washington, D.C. *volume 15 page 18*

Capitoline Museums (museums in Rome, Italy)

bust of Caesar *picture, volume 3 page 7*
Rome *volume 11 page 87*

Capricorn (astronomy): *see in index* Capricornus**Capricorn, Tropic of** (geography)

tropics *volume 13 page 98*

Capricornus (astronomy)

constellation *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

capsaicin (chemical compound)

pepper *volume 10 page 59*

Captain Hook (fictional character)

dramatization *picture, volume 4 page 72*

Captain Nemo (fictional character) *picture, volume 14 page 70*

Verne *volume 14 page 70*

capuchin monkey (monkey) *picture, volume 3 page 74***capybara** (rodent genus) *picture, volume 11 page 80*

rodent *volume 11 page 80*

car (road transport): *see in index* automobile

caracal (mammal)
lynx *volume 7 page 191*

Caracas (capital city of Venezuela)
MAIN ARTICLE *volume 3 page 36, picture, volume 3 page 36*
MORE TO EXPLORE
Venezuela *volume 14 page 63*

Caravaggio (Italian painter)
painting *volume 10 page 10*

carbohydrate (biochemistry)
food and nutrition *volume 5 page 43*

carbon (chemical element)
atom *picture, volume 1 page 225*
steel *volume 12 page 184*

carbon-14 dating (technology): *see in index* radiocarbon dating

carbon dioxide (chemical compound)
air *volume 1 page 51*
blood *volume 2 page 92, picture, volume 3 page 40*
fermentation *volume 5 page 11*
global warming *volume 5 page 121*
living thing *volume 7 page 168*
photosynthesis *volume 10 page 78*
respiratory system *volume 11 page 54*
lung *volume 7 page 184*

cardboard (grade of paper)
paper *volume 10 page 28*

card catalog (library science)
library *volume 7 page 143*

cardiac muscle (anatomy) *picture, volume 8 page 209*
cardiovascular system *volume 3 page 38*
muscle *volume 8 page 209*

Cardiff (capital city of Wales, United Kingdom)
MAIN ARTICLE *volume 3 page 37, picture, volume 3 page 37*
MORE TO EXPLORE
Wales *volume 15 page 4*

Cardiff Castle (building in Cardiff, Wales, United Kingdom) *picture, volume 3 page 37*
Cardiff *volume 3 page 37*

cardinal (Roman Catholicism)
pope *volume 10 page 125*

cardinal (bird)
MAIN ARTICLE *volume 3 page 37*
MORE TO EXPLORE
finch *volume 5 page 21*
northern cardinal *picture, volume 3 page 38*

Cardinals (U.S. baseball team): *see in index* Saint Louis Cardinals

cardiovascular system (anatomy and physiology)
MAIN ARTICLE *volume 3 page 38, picture, volume 3 page 38, picture, volume 3 page 39, picture, volume 3 page 40*
MORE TO EXPLORE
circulatory system *volume 3 page 119*

cargo ship *picture, volume 12 page 81*
ship *volume 12 page 82*

Carib (Native American people)
MAIN ARTICLE *volume 3 page 40*
MORE TO EXPLORE
Arawak *volume 1 page 162*
Carib basket weaver *picture, volume 3 page 40*
Dominica *volume 4 page 65*
Grenada *volume 5 page 160*

Caribbean (geographical region in the Americas): *see in index* West Indies

Caribbean manatee (mammal)
manatee *volume 8 page 39*

Caribbean Sea (sea of the Atlantic Ocean)
MAIN ARTICLE *volume 3 page 41, picture, volume 3 page 41*
MORE TO EXPLORE
Carib *volume 3 page 40*

caribou (mammal): *see in index* reindeer

caries (dental problem): *see in index* tooth decay

Carlos, John (U.S. athlete)
1968 Olympic Games *picture, volume 1 page 44*

Carlsbad Caverns National Park (national park in New Mexico, U.S.)
stalagmites *picture, volume 3 page 62*

Carmel (city in California, U.S.)
California missions *table, volume 8 page 140*

carnation (plant and flower)
MAIN ARTICLE *volume 3 page 42, picture, volume 3 page 42*

carnelian (mineral)
jewelry and gems *volume 7 page 24*

Carnival (pre-Lent festival)
Rio de Janeiro *volume 11 page 66, picture, volume 2 page 127*
Trinidad and Tobago *picture, volume 13 page 97*

carnivore (meat-eating animal)
dinosaur *volume 4 page 51*
mouth structure *picture, volume 4 page 51*
mammal *volume 8 page 36*

carnivorous plant
pitcher plant *volume 10 page 90*
Venus's-flytrap *volume 14 page 67*

carp (fish)
MAIN ARTICLE *volume 3 page 42, picture, volume 3 page 42*

carpal bone (anatomy)
arm *picture, volume 1 page 182*

Carpathian Mountains (mountains in Europe)
Romania *volume 11 page 84*

carpenter ant (insect) *picture, volume 1 page 133*

carpentry: *see in index* woodworking

carpet (floor covering): *see in index* rug

carpetbagger (U.S. history)
Reconstruction *volume 11 page 34, picture, volume 11 page 34*

carpooling
conservation *picture, volume 3 page 187*

Carranza, Venustiano (president of Mexico)
Villa *volume 14 page 91*
Zapata *volume 15 page 102*

carrion crow (bird) *picture, volume 3 page 222*
crows *volume 3 page 222*

Carroll, Lewis (British author)
MAIN ARTICLE *volume 3 page 43*
MORE TO EXPLORE
literature for children *volume 7 page 164*

carrot (plant and edible root)
MAIN ARTICLE *volume 3 page 43, picture, volume 3 page 44*

Carson, Kit (U.S. frontiersman)

MAIN ARTICLE *volume 3 page 44*, *picture*, *volume 3 page 44*

Carson City (state capital of Nevada, U.S.)

MAIN ARTICLE *volume 3 page 45*, *picture*, *volume 3 page 45*

MORE TO EXPLORE

Nevada *volume 9 page 40*

Carter, Howard (British archaeologist)

Tutankhamen *volume 13 page 119*

Carter, Jimmy (president of the U.S.)

MAIN ARTICLE *volume 3 page 46*, *picture*, *volume 3 page 46*

MORE TO EXPLORE

Ford *volume 5 page 52*

Georgia *volume 5 page 102*

timeline *volume 3 page 46*

Carter, Rosalynn Smith (first lady of the U.S.)

Carter, Jimmy *volume 3 page 46*

Carter Center (U.S. human rights organization)

Carter *volume 3 page 47*

Carter family (U.S. singers)

country music *volume 3 page 208*

Carthage (ancient city in Tunisia)

MAIN ARTICLE *volume 3 page 47*, *picture*, *volume 3 page 47*

MORE TO EXPLORE

ancient Rome *volume 11 page 89*

Phoenician *volume 10 page 75*

Tunisia *volume 13 page 110*

Tunis *volume 13 page 108*

Cartier, Jacques (French explorer)

MAIN ARTICLE *volume 3 page 48*

MORE TO EXPLORE

Canada *volume 3 page 25*

exploration and settlement of the

Americas *volume 1 page 103*

New Brunswick *volume 9 page 43*

Prince Edward Island *volume 10 page 151*

Quebec *volume 11 page 9*

cartilage (anatomy)

knee *volume 7 page 74*

knee joint in cross section *picture*, *volume 12 page 97*

shark *volume 12 page 76*

skeletal system *volume 12 page 97*

cartography: *see in index* atlas; map

cartoon

MAIN ARTICLE *volume 3 page 49*

Cartwright, Alexander (U.S. sportsman)

baseball *volume 2 page 32*

Carver, George Washington (U.S. agriculturist and chemist)

MAIN ARTICLE *volume 3 page 50*, *picture*, *volume 3 page 50*

MORE TO EXPLORE

peanut *volume 10 page 47*

carving

ancient Phoenician ship *picture*, *volume 10 page 74*

Indus Valley Civilization *picture*, *volume 6 page 136*

Maori village *picture*, *volume 9 page 62*

sculpture *volume 12 page 55*

Casamance (region in Senegal)

Senegal *volume 12 page 66*

casbah (fortress)

Moroccan ruins *picture*, *volume 1 page 42*

cascade (waterfall)

waterfall *volume 15 page 24*

Cascade Range (mountain range in the U.S.)

Columbia River Gorge *picture*, *volume 3 page 161*

Oregon *volume 9 page 147*

Washington *volume 15 page 15*

Cash, Johnny (U.S. singer-songwriter)

country music *volume 3 page 208*

cashmere (animal-hair fiber)

Mongolia *volume 8 page 164*

cashmere goat (breed of goat): *see in*

index Kashmir goat

Caspian Sea (inland sea in Eurasia)

MAIN ARTICLE *volume 3 page 51*

MORE TO EXPLORE

facts about Asia *volume 1 page 205*

facts about Europe *volume 4 page 163*

oil derricks *picture*, *volume 2 page 10*

cassette

sound recording *volume 12 page 136*

Cassini (United States space probe)

Saturn *volume 12 page 42*

cassowary (bird)

flightless birds *volume 2 page 79*

caste (social practice)

MAIN ARTICLE *volume 3 page 52*

MORE TO EXPLORE

Hinduism *volume 6 page 57*

India *volume 6 page 124*

Mauryan Empire *volume 8 page 81*

Castilian (Spanish dialect)

Spain *volume 12 page 154*

Castillo (pyramid in Mayapán, Mexico)

pyramid *volume 10 page 171*

Castillo de San Marcos National

Monument (monument in Saint Augustine, Florida, U.S.) *picture*, *volume 12 page 10*

Saint Augustine *volume 12 page 10*

casting (technology)

sculpture *volume 12 page 56*

castle (stronghold and residence)

MAIN ARTICLE *volume 3 page 52*, *picture*, *volume 3 page 53*

MORE TO EXPLORE

catapult *volume 3 page 59*

images

Conwy Castle *picture*, *volume 15 page 4*

Edinburgh Castle *picture*, *volume 4 page 104*

Liechtenstein *picture*, *volume 7*

page 147, *picture*, *volume 14 page 51*

Olavinlinna Castle *picture*, *volume 5 page 23*

Orava Castle *picture*, *volume 12 page 109*

Romania *picture*, *volume 11 page 85*

Swallow's Nest Castle *picture*, *volume 4 page 164*

Sweden *picture*, *volume 12 page 212*

Trakai Castle *picture*, *volume 7 page 165*

Vianden Castle *picture*, *volume 7 page 187*

Castries (capital city of Saint Lucia)

MAIN ARTICLE *volume 3 page 54*, *picture*, *volume 3 page 54*

MORE TO EXPLORE

Saint Lucia *volume 12 page 14*

Castro, Fidel (political leader of Cuba)

MAIN ARTICLE *volume 3 page 54*, *picture*, *volume 3 page 55*

MORE TO EXPLORE

Cuba *volume 3 page 228*

Havana *volume 6 page 25*

Castro, Raúl (Cuban politician)Castro *volume 3 page 55***cat** (domesticated mammal)MAIN ARTICLE *volume 3 page 55*, *picture*, *volume 3 page 55*

MORE TO EXPLORE

anatomy and physiology

brain *picture*, *volume 2 page 122*claw *picture*, *volume 9 page 4*pet *volume 10 page 66***catacomb** (underground cemetery)MAIN ARTICLE *volume 3 page 58*, *picture*, *volume 3 page 58***Catalan** (Spanish dialect)Spain *volume 12 page 154***Catalina Island** (island in California,U.S.): *see in index* Santa Catalina Island**catalytic converter** (device)automobile *volume 1 page 236*, *picture*, *volume 1 page 235***catapult** (machine)MAIN ARTICLE *volume 3 page 59*, *picture*, *volume 3 page 59*

MORE TO EXPLORE

weapon *volume 15 page 25***cataract** (medical disorder)blindness *volume 2 page 90***cataract** (waterfall)waterfall *volume 15 page 24***caterpillar** (insect larva)butterfly and moth *volume 2 page 158*Monarch butterfly *picture*, *volume 2 page 158***catfish** (fish)MAIN ARTICLE *volume 3 page 60*, *picture*, *volume 3 page 60*

MORE TO EXPLORE

sensory reception *picture*, *volume 12 page 68***cathedral** (Christian church)MAIN ARTICLE *volume 3 page 60*

MORE TO EXPLORE

church *volume 3 page 117*gargoyle waterspout *volume 5 page 90*
imagesAlexander Nevsky Cathedral *picture*, *volume 12 page 122*Arequipa *picture*, *volume 10 page 65*Fort-de-France *picture*, *volume 8 page 66*Guatemala City *picture*, *volume 5 page 168*Roseau *picture*, *volume 11 page 98*Saint Coleman's Cathedral *picture*, *volume 3 page 61*Zagreb *picture*, *volume 15 page 100*Middle Ages *volume 8 page 123***Cathedral of:** *see in index under the specific part of the name, for example, Saint Paul, Cathedral of***Catherine II** (empress of Russia): *see in index* Catherine the Great**Catherine Howard** (queen of England)Henry VIII *volume 6 page 39***Catherine of Aragon** (queen of England)Henry VIII *volume 6 page 39***Catherine Parr** (queen of England)Henry VIII *volume 6 page 39***Catherine the Great** (empress of Russia)*picture*, *volume 11 page 107*Russia *volume 11 page 106***Catholic Monarchs** (Spanish history)Ferdinand and Isabella *volume 5 page 10***Catholic Reformation** (religious history):*see in index* Counter-Reformation**"Cat in the Hat, The"** (book by Dr.

Seuss)

Dr. Seuss *volume 12 page 73*literature for children *volume 7 page 164***catkin** (flower cluster)birch *volume 2 page 75***cattle** (livestock)MAIN ARTICLE *volume 3 page 61*

MORE TO EXPLORE

gauchos *picture*, *volume 3 page 61*, *picture*, *volume 14 page 42*Sudan *picture*, *volume 12 page 200*Texas *volume 13 page 51***cattle drive** (U.S. history)Texas *volume 13 page 52***Caucasus** (mountainous region in Eur-asia): *see in index* Armenia; Azerbaijan; Georgia, Republic of**cauliflower** (vegetable)cabbage *volume 3 page 4***cavalryman** (military)Pulaski *volume 10 page 166***cave** (landform)MAIN ARTICLE *volume 3 page 62*, *picture*, *volume 3 page 62*, *picture*, *volume 3 page 63***cave exploration**cave *volume 3 page 63***cave painting**Chumash people *picture*, *volume 3 page 116*painting *volume 10 page 8*Spain *picture*, *volume 10 page 8***caver** (cave explorer): *see in index* spelunker**caviar** (food)Caspian Sea *volume 3 page 51*egg *volume 4 page 108***cavity** (dentistry)dentistry *volume 4 page 38*teeth *volume 13 page 31***Cayenne** (capital city of French Guiana)French Guiana *volume 5 page 67***Cayor** (historical West African kingdom)Wolof Empire *volume 15 page 55***Cayuga** (Native American people)MAIN ARTICLE *volume 3 page 64*

MORE TO EXPLORE

Hiawatha *volume 6 page 49*Iroquois *volume 6 page 160***CCC** (U.S. history): *see in index* Civilian

Conservation Corps

CD (digital recording media): *see in index*

compact disc

CD-ROM (computing)common abbreviations *table*, *volume 1 page 8*compact disc *volume 3 page 170***Ceausescu, Nicolae** (president of Romania)Romania *volume 11 page 85***cedar** (tree)MAIN ARTICLE *volume 3 page 65*, *picture*, *volume 3 page 65***cedar elm** (tree)elm *volume 4 page 128***cedar of Lebanon** (tree) *picture*, *volume 3 page 65***celestial goldfish**goldfish *volume 5 page 123*

celestial navigation

navigation *volume 9 page 24*, *picture*, *volume 9 page 25*

cell (biology)

MAIN ARTICLE *volume 3 page 65*

MORE TO EXPLORE

aging *volume 1 page 47*
 animal cells *picture*, *volume 3 page 66*
 cancer *volume 3 page 30*
 drug *volume 4 page 78*
 genetics *volume 5 page 93*
 living thing *volume 7 page 168*
 nail and claw *volume 9 page 4*
 plant cells *picture*, *volume 3 page 67*
 protozoan *volume 10 page 159*
 virus *volume 14 page 97*, *picture*, *volume 14 page 98*

cell (compartment)

paper wasp nest *picture*, *volume 9 page 37*
 prison *picture*, *volume 10 page 154*

cell (communications area)

telephone *volume 13 page 36*

cell division (biological process)

amoeba *volume 1 page 109*

cell membrane (part of living cell)

cell *volume 3 page 66*
 animal cell *picture*, *volume 3 page 66*

cello (musical instrument)

stringed instruments *picture*, *volume 8 page 216*

cell phone (communications)

images
 communication over distances *picture*, *volume 3 page 166*
 telecommunication antennas *picture*, *volume 13 page 34*
 photography *volume 10 page 77*
 radio *volume 11 page 19*
 telephone *volume 13 page 36*

cell system (biology): *see in index* cell**celluloid** (plastic)

plastic *volume 10 page 97*

cellulose (biochemical compound)

cell *volume 3 page 67*

cell wall (part of plant cell)

cell *volume 3 page 67*, *picture*, *volume 3 page 67*

Celsius (temperature scale)

common abbreviations *table*, *volume 1 page 8*

Celt (people)

MAIN ARTICLE *volume 3 page 67*

MORE TO EXPLORE

Anglo-Saxon *volume 1 page 121*
 decorated bowl *picture*, *volume 3 page 68*
 England *volume 4 page 140*
 Ireland *volume 6 page 154*
 Northern Ireland *volume 9 page 89*
 Scotland *volume 12 page 53*
 Ulster *volume 14 page 8*
 United Kingdom *volume 14 page 18*
 Wales *volume 15 page 4*

Celtic religion

Celts *volume 3 page 68*

cement (building material)

MAIN ARTICLE *volume 3 page 68*, *picture*, *volume 3 page 68*

MORE TO EXPLORE

concrete *volume 3 page 175*

Cenozoic era

geology *volume 5 page 97*
 prehistoric life *volume 10 page 146*, *table*, *volume 10 page 145*

censorship

MAIN ARTICLE *volume 3 page 69*, *picture*, *volume 3 page 69*

MORE TO EXPLORE

Blume *volume 2 page 96*

census

MAIN ARTICLE *volume 3 page 70*

MORE TO EXPLORE

interview *picture*, *volume 3 page 70*

Centennial Olympic Park (event venue in Atlanta, Georgia, U.S.)

Fountain of Rings *picture*, *volume 1 page 219*

Centennial State (state in the U.S.): *see in index* Colorado**centigrade** (temperature scale): *see in index* Celsius**centimeter** (measurement)

common abbreviations *table*, *volume 1 page 8*

centipede (many-footed animal)

MAIN ARTICLE *volume 3 page 72*, *picture*, *volume 3 page 72*

Central African Federation (historical federation in Africa): *see in index* Rhodesia and Nyasaland, Federation of**Central African Republic** (country in Africa)

MAIN ARTICLE *volume 3 page 73*

Central America (southernmost region of North America)

MAIN ARTICLE *volume 3 page 74*

MORE TO EXPLORE

capuchin monkey *picture*, *volume 3 page 74*
 exploration and settlement of the Americas *volume 1 page 103*
 geography
 Latin America *volume 7 page 112*
 Mayan ruins *picture*, *volume 3 page 75*
 Hispanic Americans *volume 6 page 62*
 Native Americans: *see in index* Middle American Indian
 traditional dress *picture*, *volume 3 page 75*

Central American Indian (Native American people)

Central America *volume 3 page 74*
 Guatemala *volume 5 page 166*

Central Asia (region in Asia)

Asia *volume 1 page 200*
 Tian Shan *picture*, *volume 1 page 202*

Central Intelligence Agency (U.S. government)

spy *volume 12 page 170*

Central Lowlands (region in Scotland, United Kingdom)

Scotland *volume 12 page 52*

central nervous system (anatomy and physiology)

skeletal system *volume 12 page 96*

Central Park (park in New York City, New York, U.S.)

aerial view *picture*, *volume 9 page 59*
 grassy area *picture*, *volume 5 page 141*

Central Plateau (region in Namibia)

Namibia *volume 9 page 6*

Central Powers (history of World War I)

World War I *volume 15 page 61*

central processing unit (computer)

computer *volume 3 page 172*

Central Valley (valley in California, U.S.)

California *volume 3 page 11*

ceramics

MAIN ARTICLE *volume 3 page 76, picture, volume 3 page 76*

ceramic tile (building material) *picture, volume 3 page 76*
brick and tile *volume 2 page 129*

Ceratosaurus (dinosaur)

dinosaurs in scale *picture, volume 4 page 53*
mouth structure *picture, volume 4 page 51*

cercus (insect anatomy)

cockroach *volume 3 page 147*

cereal (food and plant): *see in index* grain**cerebellum** (anatomy)

brain *volume 2 page 122, picture, volume 2 page 122*

cerebral palsy (disease)

MAIN ARTICLE *volume 3 page 77, picture, volume 3 page 77*

cerebrum (anatomy)

brain *volume 2 page 122, picture, volume 2 page 122*
cerebral palsy *volume 3 page 77*

ceremony (sociology)

reed dance *picture, volume 12 page 211*
Zoroastrian priest *picture, volume 15 page 109*

Ceres (Roman goddess)

Demeter *volume 4 page 34*

Cervantes, Miguel de (Spanish author)

literature *volume 7 page 162*

cervix (anatomy) *picture, volume 11 page 47*

reproductive system *volume 11 page 50*

Cesis (city in Latvia)

medieval castle *picture, volume 7 page 115*

Cetinje (capital city of Montenegro)

Montenegro *volume 8 page 175*

Ceylon (island country in the Indian Ocean): *see in index* Sri Lanka

Chaco Boreal (region in South America)

Bolivia *volume 2 page 103*

Chaco War (South American history, 1932-35)

Bolivia *volume 2 page 103*
Paraguay *volume 10 page 31*

Chad (country in Africa)

MAIN ARTICLE *volume 3 page 78*

Chagall, Marc (Russian-born French artist)

painting *volume 10 page 11*

chain (connecting device)

machine *volume 8 page 7*

chair (furniture)

metalwork *picture, volume 8 page 106*

Chakri dynasty (Thai dynasty)

Thailand *volume 13 page 55*

Chaldean (people)

Mesopotamia *volume 8 page 104*

chalk (soft rock)

MAIN ARTICLE *volume 3 page 79, picture, volume 3 page 79*

MORE TO EXPLORE

girl writing with chalk *picture, volume 15 page 78*

“Challenger” (space shuttle)

Ride *volume 11 page 65, picture, volume 11 page 65*
space exploration *volume 12 page 152*

Chalten, El (mountain in Argentina): *see in index* Fitzroy, Mount

chamber (stomach)

stomach *volume 12 page 188*

Chamberlain’s Men (English theater company): *see in index* Lord Chamberlain’s Men

chamber orchestra (music)

orchestra *volume 9 page 146*

chameleon (reptile)

MAIN ARTICLE *volume 3 page 79*

MORE TO EXPLORE

lizard *volume 7 page 169*
panther chameleon *picture, volume 3 page 80*

Chamorro (people)

Guam *volume 5 page 165*

Champlain, Lake (lake in Canada and the U.S.)

Champlain *volume 3 page 81*

Champlain, Samuel de (French explorer)

MAIN ARTICLE *volume 3 page 80, picture, volume 3 page 80*

MORE TO EXPLORE

exploration of the Americas *volume 1 page 105*

places

Canada *volume 3 page 25*
New Brunswick *volume 9 page 43*
Nova Scotia *volume 9 page 102*
Ontario *volume 9 page 140*
Quebec *volume 11 page 9*

Chandra Gupta (Indian rulers): *see in index* Candra Gupta I

Chang Jiang (river in China): *see in index* Yangtze River

Channa (Indian charioteer)

Buddha *volume 2 page 142*

Channel Islands (islands in the English Channel)

English Channel *volume 4 page 142*

Channel Tunnel (undersea tunnel in Europe)

English Channel *volume 4 page 142*

Chanukah (Judaism): *see in index* Hanukkah

Chao Phraya (river in Thailand)

Thailand *volume 13 page 54*

chapter book (type of book)

literature for children *volume 7 page 163*

Charbonneau, Toussaint (French Canadian explorer)

Sacagawea *volume 12 page 4*

charcoal drawing *picture, volume 4 page 75*

chard (plant): *see in index* Swiss chard

chariot (vehicle)

war *volume 15 page 10, picture, volume 15 page 9*

Charlemagne (Holy Roman emperor)

MAIN ARTICLE *volume 3 page 81, picture, volume 3 page 82*

MORE TO EXPLORE

Europe *volume 4 page 164*
France *volume 5 page 59*
Franks *volume 5 page 61*
Germany *volume 5 page 106*
Holy Roman Empire *volume 6 page 74*
Middle Ages *volume 8 page 122*

Charles I (king of Great Britain and Ireland)

- Maryland *volume 8 page 68*
 Massachusetts Bay Colony *volume 8 page 74*
 Puritans *volume 10 page 169*
- Charles II** (king of Great Britain and Ireland)
 fur trade *volume 5 page 76*
 Massachusetts Bay Colony *volume 8 page 75*
 Penn *volume 10 page 54*
- Charles V** (Holy Roman emperor and king of Spain)
 Hapsburgs *volume 6 page 16*
 Spain *volume 12 page 155*
- Charles VII** (king of France)
 Joan of Arc *volume 7 page 25*
- Charles, Ray** (U.S. musician)
 MAIN ARTICLE *volume 3 page 82, picture, volume 3 page 82*
- Charleston** (city in South Carolina, U.S.)
 historic homes along the Battery *picture, volume 12 page 148*
- Charleston** (state capital of West Virginia, U.S.)
 MAIN ARTICLE *volume 3 page 83*
 MORE TO EXPLORE
 State Capitol *picture, volume 3 page 83*
 West Virginia *volume 15 page 34*
- Charles Towne** (capital city of The Bahamas): *see in index* Nassau
- “Charlie and the Chocolate Factory”**
 (work by Dahl)
 Dahl *volume 4 page 5*
- Charlot** (Flathead chief) *picture, volume 5 page 32*
- Charlotte Amalie** (capital city of U.S. Virgin Islands)
 harbor *picture, volume 15 page 32*
- Charlottetown** (provincial capital of Prince Edward Island, Canada)
 Prince Edward Island *volume 10 page 150*
- Charon** (moon of Pluto)
 Pluto *volume 10 page 102*
- Charrúa** (people)
 Uruguay *volume 14 page 43*
- chart** (map)
 navigation *volume 9 page 24, picture, volume 9 page 24*
- Chartres Cathedral** (cathedral in Chartres, France) *picture, volume 8 page 123*
- chassis** (mechanics)
 automobile *volume 1 page 235*
- château** (French castle or mansion)
 Loire River *picture, volume 7 page 173*
- Chaucer, Geoffrey** (English author)
 literature *volume 7 page 161*
- Chavez, Cesar** (U.S. labor leader)
 MAIN ARTICLE *volume 3 page 83, picture, volume 3 page 84*
 MORE TO EXPLORE
 Hispanic Americans *volume 6 page 62*
- check** (finance)
 banking *volume 2 page 24*
- check** (sports)
 ice hockey *volume 6 page 69*
- checks and balances** (government)
 United States Constitution *volume 14 page 32*
- cheese** (food)
 fermentation *volume 5 page 11*
 production *picture, volume 15 page 53*
- cheetah** (mammal)
 MAIN ARTICLE *volume 3 page 84, picture, volume 3 page 84*
- Chekhov, Anton** (Russian author)
 drama *volume 4 page 74*
- chemical:** *see in index* chemical compound
- chemical bond** (chemistry): *see in index* bonding
- chemical compound**
 chemical element *volume 3 page 85*
 chemistry *volume 3 page 87*
 molecule *volume 8 page 156*
 plastic *volume 10 page 97*
 pollution *volume 10 page 118, picture, volume 10 page 117*
- chemical element**
 MAIN ARTICLE *volume 3 page 85*
 MORE TO EXPLORE
 chemistry *volume 3 page 87*
 periodic table *table, volume 3 page 86*
- chemical property**
 matter *volume 8 page 78*
- chemical reaction**
 matter *volume 8 page 78*
- chemical symbol** (scientific abbreviation)
 chemical element *volume 3 page 85*
- chemical weapon**
 Iran-Iraq War *volume 6 page 150*
 World War I *volume 15 page 62*
- chemistry** (science)
 MAIN ARTICLE *volume 3 page 86*
 MORE TO EXPLORE
 alchemy *volume 1 page 71*
 students *picture, volume 3 page 87*
- chemotherapy** (medical procedure)
 cancer *volume 3 page 31*
- Chen Kaige** (Chinese director) *picture, volume 8 page 198*
- Chernobyl accident** (nuclear disaster, Union of Soviet Socialist Republics)
 Belarus *volume 2 page 52*
 nuclear energy *volume 9 page 105*
- Cherokee** (Native American people)
 MAIN ARTICLE *volume 3 page 87*
 MORE TO EXPLORE
 images
 dancer in festive clothing *picture, volume 9 page 18*
 dancers *picture, volume 3 page 88*
 Jackson *volume 7 page 6*
 Native Americans *volume 9 page 19*
 Sequoyah *volume 12 page 70*
 Tennessee *volume 13 page 44*
 Trail of Tears *volume 13 page 89, picture, volume 13 page 89*
- Cherokee language**
 Cherokee people *volume 3 page 88*
 Sequoyah *volume 12 page 70*
- Cherokee syllabary** (writing system)
 alphabet *volume 1 page 88*
 Sequoyah *volume 12 page 70*
- Cherrapunji** (town in India)
 Asia *volume 1 page 202*
- cherry** (tree and fruit)
 MAIN ARTICLE *volume 3 page 88*
 MORE TO EXPLORE
 cherry blossoms *picture, volume 7 page 12*
 sour cherries *picture, volume 3 page 88*
- Chesapeake Bay** (bay in the U.S.)
 Maryland *volume 8 page 68, picture, volume 8 page 69*
 Thomas Point Lighthouse *picture, volume 7 page 149*

chess (game)

Kasparov against Deep Junior *picture, volume 1 page 195*

chestnut (tree and nut)

MAIN ARTICLE *volume 3 page 89, picture, volume 3 page 89*

MORE TO EXPLORE

nut *volume 9 page 112*

chestnut blight (plant disease)

chestnut *volume 3 page 89*

chewing (physiology)

tongue *volume 13 page 80*

Cheyenne (Native American people)

MAIN ARTICLE *volume 3 page 90*

MORE TO EXPLORE

beadwork amulet *picture, volume 9 page 18*

Custer *volume 3 page 233*

festival *picture, volume 3 page 90*

Native Americans *volume 9 page 16*

Cheyenne (state capital of Wyoming, U.S.)

MAIN ARTICLE *volume 3 page 90*

MORE TO EXPLORE

State Capitol *picture, volume 3 page 91*

Wyoming *volume 15 page 79*

Chiang Kai-shek (Chinese leader)

MAIN ARTICLE *volume 3 page 91, picture, volume 3 page 91*

MORE TO EXPLORE

China *volume 3 page 104*

Mao *volume 8 page 48*

Sun Yat-sen *volume 12 page 205*

Chiapas (state in Mexico)

Mexico *volume 8 page 112*

Chibcha (Native American people)

Bogotá *volume 2 page 100*

South America *volume 12 page 144*

Chicago (city in Illinois, U.S.)

MAIN ARTICLE *volume 3 page 92, picture, volume 3 page 93, picture, volume 6 page 117*

MORE TO EXPLORE

arts

architecture *volume 1 page 171*

blues *volume 2 page 95*

jazz *volume 7 page 16*

Millennium Park *picture, volume 3 page 92, picture, volume 13 page 21*

sculpture by Picasso *picture, volume 10 page 79*

buildings in 1911 *picture, volume 1 page 57*

Chinatown *picture, volume 1 page 207*

elevated railway *picture, volume 13 page 92*

Illinois *volume 6 page 116*

important people

Addams *volume 1 page 27*

Du Sable *volume 4 page 83*

Lake Michigan *volume 8 page 118*

softball *volume 12 page 123*

United States *volume 14 page 27*

Chicago Bears (U.S. football team)

Payton *volume 10 page 42, picture, volume 10 page 42*

Chicago Bulls (U.S. basketball team)

Jordan *volume 7 page 35, picture, volume 7 page 35*

Chicago City Ballet (U.S. ballet company)

Tallchief *volume 13 page 13*

Chichén Itzá (ancient city in Mexico)

Mayan architecture *picture, volume 8 page 82*

Chichimec (Native American people)

Toltec *volume 13 page 78*

Chickasaw (Native American people)

MAIN ARTICLE *volume 3 page 93*

MORE TO EXPLORE

Chickasaw rattles *picture, volume 3 page 94*

chicken (bird)

MAIN ARTICLE *volume 3 page 94*

MORE TO EXPLORE

chicken house in India *picture, volume 10 page 140*

four animal skeletal systems *picture, volume 12 page 95*

leg *picture, volume 7 page 123*

rooster *picture, volume 3 page 94*

vertebrate embryo development *picture, volume 5 page 109*

wing *picture, volume 1 page 182*

chicken pox (disease)

MAIN ARTICLE *volume 3 page 95, picture, volume 3 page 95*

Chihuahua (breed of dog)

dog table, *volume 4 page 62*

Chikamatsu Monzaemon (Japanese dramatist)

drama *volume 4 page 74*

child (human)

images

car safety *picture, volume 12 page 7*

child affected by polio *picture, volume 10 page 113*

children learning to read *picture, volume 7 page 164*

Children's Crusades *picture, volume 3 page 224*

globe *picture, volume 8 page 49*

identical twins *picture, volume 5 page 94*

language development *picture, volume 7 page 104*

medical check-up for strep throat *picture, volume 12 page 196*

nursery rhyme *volume 9 page 110*

child development

MAIN ARTICLE *volume 3 page 96, picture, volume 3 page 97*

MORE TO EXPLORE

Down syndrome *volume 4 page 69*

language development *picture, volume 7 page 104*

learning to read *picture, volume 7 page 164*

childhood: *see in index* child development

children's literature: *see in index* literature for children

Children's Museum of Indianapolis

(museum in Indianapolis, Indiana, U.S.)

Indianapolis *volume 6 page 128*

Chile (country in South America)

MAIN ARTICLE *volume 3 page 98*

MORE TO EXPLORE

abolitionist movement *volume 1 page 11*

folk music and dance *picture, volume 3 page 99*

Laguna Miscanti *picture, volume 3 page 99*

Peru *volume 10 page 65*

Chimborazo (mountain in Ecuador)

Ecuador *volume 4 page 102*

chimpanzee (primate)

MAIN ARTICLE *volume 3 page 100*

MORE TO EXPLORE

apes *volume 1 page 146*

Goodall *volume 5 page 126*

West African chimpanzee *picture, volume 3 page 100*

China (country in Asia)

MAIN ARTICLE *volume 3 page 101*

MORE TO EXPLORE

apricot *volume 1 page 153*

arts

architecture *volume 1 page 169*

Forbidden City *picture, volume 3 page 104*

Temple of Heaven *picture, volume 2 page 50*

calligraphy *volume 3 page 15*

drawing *volume 4 page 76*

painting

depiction of Confucius *picture, volume 3 page 178*

scroll painting *picture, volume 10 page 9*

pottery *volume 10 page 139*

porcelain vases *picture, volume 10 page 139*

sculpture *picture, volume 1 page 128*

ancient tomb in China *picture, volume 1 page 163*

geography

Asia *volume 1 page 200*

Great Wall of China *volume 5*

page 148, picture, volume 5 page 149

Hong Kong *volume 6 page 78, picture, volume 4 page 132, picture, volume 6 page 78*

Macau *volume 8 page 4*

Mount Everest *volume 4 page 167*

Three Gorges region *picture, volume 3 page 102*

Tibet *volume 13 page 62*

Xi'an *picture, volume 3 page 103*

Yangtze River *picture, volume 15 page 87*

history

census *volume 3 page 71*

Chiang *volume 3 page 91*

Confucius *volume 3 page 178*

Dalai Lama *volume 4 page 8*

Genghis Khan *volume 5 page 96*

Japan *volume 7 page 13*

Korean War *volume 7 page 85*

money *volume 8 page 161*

Mongol Empire *volume 8 page 161*

Nixon *volume 9 page 74*

North Korea *volume 7 page 81*

postal service *volume 10 page 136*

timeline *volume 3 page 101*

Vietnam *volume 14 page 85*

World War II *volume 15 page 65*

industry

paper *volume 10 page 28*

silk *volume 12 page 89*

people and culture

Chinese New Year *volume 3 page 105*

Daoism *volume 4 page 15*

flag *volume 5 page 30*

kite *volume 7 page 72*

mythology *volume 8 page 224*

pet dogs *volume 4 page 63*

tea *volume 13 page 25*

plants and animals

ginkgo *volume 5 page 115*

panda *picture, volume 10 page 25*

science and technology

acupuncture *volume 1 page 20*

clay pipe *picture, volume 3 page 133*

printing *volume 10 page 153*

robot *volume 11 page 74*

rocket *volume 11 page 77*

technology and invention *volume 13 page 26*

sports

archery *volume 1 page 166*

martial arts *picture, volume 2 page 50*

volleyball tournament *picture, volume 14 page 104*

wrestling *picture, volume 15 page 74*

China, Republic of (self-governing island in Asia): *see in index* Taiwan

Ch'in Dynasty (Chinese history, 221-206 BC): *see in index* Qin Dynasty

Chinese (people)

Macau *volume 8 page 4*

Singapore *volume 12 page 91*

Chinese alligator (reptile)

alligator *volume 1 page 85*

Chinese American (people)

Chinese New Year festivities *picture, volume 1 page 207*

Chinese calendar

calendar *volume 3 page 10*

Chinese chestnut (tree)

chestnut *volume 3 page 89*

Chinese Communist Party (political

party in China)

Chiang *volume 3 page 91*

Mao *volume 8 page 48, picture, volume 8 page 48*

Taiwan *volume 13 page 9*

Taipei *volume 13 page 7*

Chinese elm (tree)

elm *volume 4 page 128*

Chinese Exclusion Act (U.S. legislation, 1882)

Arthur's administration *volume 1 page 193*

Asian Americans *volume 1 page 207*

Chinese gooseberry (fruit): *see in index* kiwi

Chinese New Year

MAIN ARTICLE *volume 3 page 105*

MORE TO EXPLORE

New Year's Day *volume 9 page 56*

parades *picture, volume 1 page 207, picture, volume 3 page 105*

Chinese Revolution (1911-12)

Mao *volume 8 page 47*

Chinese snowball (shrub)

viburnum *volume 14 page 76*

Chinese white-cheeked gibbon (primate)

apes *picture, volume 1 page 147*

Chinese writing

alphabet *volume 1 page 88*

document written in Chinese characters *picture, volume 1 page 88*

Ch'ing Dynasty (Chinese history, 1644-1911): *see in index* Qing Dynasty

chinook salmon (fish): *see in index* king salmon

chip, computer (electronics): *see in index* integrated circuit

Chipewyan (Native American people)

MAIN ARTICLE *volume 3 page 105*

MORE TO EXPLORE

Chipewyan family with tepee *picture, volume 3 page 106*

Manitoba *volume 8 page 44*

Native Americans *volume 9 page 18*

Saskatchewan *volume 12 page 39*

chipmunk (mammal)

MAIN ARTICLE *volume 3 page 106, picture, volume 3 page 106*

Chippewa (Native American people): *see in index* Ojibwa

Chiricahua (Native American people)

Cochise *volume 3 page 145*

Geronimo *volume 5 page 108*

Chiriquí (volcano in Panama): *see in index* Barú

Chisinau (capital city of Moldova)

MAIN ARTICLE *volume 3 page 107*

MORE TO EXPLORE

Moldova *volume 8 page 154*

World War I memorial park *picture, volume 3 page 107*

chitin (chemical compound)

exoskeleton *volume 4 page 172*

chlorophyll (plant physiology)

asparagus *volume 1 page 209*

cell *volume 3 page 67*

leaf *volume 7 page 118*

photosynthesis *volume 10 page 78*

chloroplast (cell component)

plant cell *picture, volume 3 page 67*

Chobe National Park (park in

Botswana)

lions *picture, volume 2 page 116*

chocolate

MAIN ARTICLE *volume 3 page 108, picture, volume 3 page 108*

Choctaw (Native American people)

MAIN ARTICLE *volume 3 page 109, picture, volume 3 page 109*

MORE TO EXPLORE

Mississippi *volume 8 page 142*

cholera (disease)

MAIN ARTICLE *volume 3 page 110*

MORE TO EXPLORE

making water safe to drink *picture, volume 3 page 110*

cholesterol (chemical compound)

MAIN ARTICLE *volume 3 page 111*

MORE TO EXPLORE

blood vessel *picture, volume 3 page 111*

food and nutrition *volume 5 page 44*

Chomolungma (mountain in Asia): *see in index* Everest, Mount

Chondogyo (Korean religion)

North Korea *volume 7 page 79*

chord (music)

music *volume 8 page 213*

choreography (dance composition)

ballet *volume 2 page 14*

dance *volume 4 page 12*

chorus (theater)

drama *volume 4 page 73*

Choson (ancient state in Korea)

North Korea *volume 7 page 80*

Choson dynasty (Korean history)

North Korea *volume 7 page 81*

Seoul *volume 12 page 69*

South Korea *volume 7 page 84*

Chou dynasty (Chinese history): *see in index* Zhou dynasty

Christ, Community of (U.S. church)

Mormons *volume 8 page 182*

Christian IV (Scandinavian king)

Oslo *volume 9 page 154*

Christiana (capital city of Norway): *see in index* Oslo

Christianity (religion)

MAIN ARTICLE *volume 3 page 112*

MORE TO EXPLORE

Bible *volume 2 page 67*

history

Abraham *volume 1 page 13*

ancient Rome *volume 11 page 90*

Jesus Christ *volume 7 page 22*

fortress in Syria *picture, volume 12 page 224*

martyr *volume 8 page 67*

Middle Ages *volume 8 page 122*

Crusades *volume 3 page 223*

important places

Bethlehem *volume 2 page 64*

Jerusalem *volume 7 page 21*

major world religions *table, volume 11 page 43*

practices

catacomb *volume 3 page 58*

cathedrals *volume 3 page 60*

church *volume 3 page 117*

Protestant church *picture, volume 3 page 113*

Roman Catholic church *picture, volume 3 page 112*

holidays

Easter *volume 4 page 93*

monk *volume 8 page 166*

pilgrimage *volume 10 page 84*

regions

Balkan Peninsula *volume 2 page 12*

Europe *volume 4 page 162*

Lebanon *volume 7 page 121*

North America *volume 9 page 81*

Palestine *volume 10 page 17*

Christian missions (Christianity): *see in index* missions

Christmas (holiday)

MAIN ARTICLE *volume 3 page 114, picture, volume 3 page 114*

MORE TO EXPLORE

Santa Claus *volume 12 page 30*

Christmas, Father (legendary person): *see in index* Santa Claus

“Christmas Carol, A” (work by Dickens)

Dickens *volume 4 page 45*

Christmas Island (island in Kiribati): *see in index* Kiritimati Atoll

Christmas tree

South Korean tree *picture, volume 3 page 114*

chromosome (part of living cell)

MAIN ARTICLE *volume 3 page 115, picture, volume 3 page 115*

MORE TO EXPLORE

cell *volume 3 page 67*

animal *picture, volume 3 page 66*

plant *picture, volume 3 page 67*

DNA *volume 4 page 60*

Down syndrome *volume 4 page 69*

gender determination *picture, volume 5 page 93*

genetics *volume 5 page 93*

“Chronicles of Narnia, The” (work by Lewis)

Lewis *volume 7 page 136*

Chumash (Native American people)

MAIN ARTICLE *volume 3 page 116*

MORE TO EXPLORE

Chumash cave painting *picture, volume 3 page 116*

Native Americans *volume 9 page 18*

Chunnel (undersea tunnel in Europe): *see in index* Channel Tunnel

church (building)

MAIN ARTICLE *volume 3 page 117*

MORE TO EXPLORE

architecture *volume 1 page 169*

cathedral *volume 3 page 60*

images

Arequipa church *picture, volume 10 page 65*

Cathedral of Saint Paul, Minnesota *picture, volume 12 page 16*

Colombian church *picture, volume 3 page 153*

colonial church in Connecticut *picture, volume 3 page 117*

- Eastern Orthodox church *picture*, volume 4 page 94, *picture*, volume 11 page 105
- Protestant Christian church interior *picture*, volume 3 page 113
- Roman Catholic churches *picture*, volume 3 page 112, *picture*, volume 15 page 85
- temple volume 13 page 42
- Churchill** (town in Manitoba, Canada) aurora *picture*, volume 1 page 227
- Churchill, Cape** (cape in Manitoba, Canada) polar bear on Hudson Bay ice *picture*, volume 8 page 45
- Churchill, Winston** (prime minister of the United Kingdom) MAIN ARTICLE volume 3 page 117, *picture*, volume 3 page 118
- MORE TO EXPLORE
- Roosevelt volume 11 page 93
 - World War II volume 15 page 70
 - meeting at Yalta *picture*, volume 15 page 70
- Church of England** (English national church): *see in index* England, Church of
- chutney** (food) mango volume 8 page 42
- chyme** (digestive system product) digestive system volume 4 page 47
- CIA** (U.S. government): *see in index* Central Intelligence Agency
- Ciboney** (Native American people) Antigua and Barbuda volume 1 page 143
- Cuba volume 3 page 228
- cicada** (insect) exoskeleton *picture*, volume 4 page 173
- locust volume 7 page 173
- Cincinnati Red Stockings** (U.S. baseball team) baseball volume 2 page 32
- Cinco de Mayo** (Mexican holiday) MAIN ARTICLE volume 3 page 118
- cinereous vulture** (bird) vulture volume 14 page 106
- CIO** (labor organization): *see in index* Congress of Industrial Organizations
- circle** (mathematics) geometry volume 5 page 99
- circle graph** (diagram) graph volume 5 page 140
- circulatory system** (anatomy and physiology) MAIN ARTICLE volume 3 page 119
- MORE TO EXPLORE
- circus (theatrical entertainment) MAIN ARTICLE volume 3 page 119
 - MORE TO EXPLORE
 - Barnum & Bailey poster *picture*, volume 3 page 120
 - clowns *picture*, volume 3 page 119
- Cirque du Soleil** (Canadian theatrical company) circus volume 3 page 121
- cirrhosis** (disease) liver volume 7 page 167
- cirrus cloud** *picture*, volume 3 page 142
- cloud volume 3 page 144, *picture*, volume 3 page 143
- Citadelle Laferrière, La** (fortress near Cap-Haïtien, Haiti) *picture*, volume 6 page 9
- Citizen Band** (Native American people) Potawatomi volume 10 page 138
- citizenship** MAIN ARTICLE volume 3 page 121, *picture*, volume 3 page 121
- MORE TO EXPLORE
- voting volume 14 page 105
- Citlaltépetl** (volcano in Mexico) Mexico volume 8 page 110
- citron** (fruit) citrus fruit volume 3 page 123
- citrus fruit** MAIN ARTICLE volume 3 page 122, *picture*, volume 3 page 122
- MORE TO EXPLORE
- grapefruit *picture*, volume 5 page 139
 - lemon *picture*, volume 7 page 127
 - lime *picture*, volume 7 page 152
 - navel orange *picture*, volume 9 page 144
- city** MAIN ARTICLE volume 3 page 123
- MORE TO EXPLORE
- civilization volume 3 page 126
 - human migration volume 8 page 129
 - modes of transportation *picture*, volume 13 page 92
- city council** (government) city volume 3 page 124
- city manager** (government official) city volume 3 page 124
- City of the Dead** (district in Cairo, Egypt) Cairo volume 3 page 8
- city-state** MAIN ARTICLE volume 3 page 126
- MORE TO EXPLORE
- Athens volume 1 page 219
 - city volume 3 page 125
 - Italy volume 6 page 173
 - Venice volume 14 page 65
- Civilian Conservation Corps** (U.S. history) *picture*, volume 9 page 44
- civilization** MAIN ARTICLE volume 3 page 126
- MORE TO EXPLORE
- delta volume 4 page 33
 - technology and invention volume 13 page 25
- civil law** (law) law volume 7 page 117
- civil liberties** (law): *see in index* civil rights
- civil rights** (law) MAIN ARTICLE volume 3 page 128
- MORE TO EXPLORE
- human rights volume 6 page 96
 - National Association for the Advancement of Colored People volume 9 page 14
 - Standing Bear and Indian rights *picture*, volume 10 page 122
- Civil Rights Act** (U.S. legislation, 1964) African Americans volume 1 page 44
- civil rights movement volume 3 page 130
- discrimination volume 4 page 55
- Johnson volume 7 page 29
- King volume 7 page 66
- United States history volume 14 page 31
- civil rights movement** (U.S. history) MAIN ARTICLE volume 3 page 129
- MORE TO EXPLORE
- African Americans volume 1 page 44
 - civil rights volume 3 page 128

- Ku Klux Klan opposition *volume 7 page 89*
- National Association for the Advancement of Colored People *volume 9 page 14*
- people *picture, volume 3 page 129*
- Abernathy *volume 1 page 9*
- Bunche *volume 2 page 150*
- Du Bois *volume 4 page 80*
- Evers *volume 4 page 168*
- Jackson *volume 7 page 7*
- King *volume 7 page 65*
- Malcolm X *volume 8 page 29*
- Parks *volume 10 page 36*
- places
- Alabama *volume 1 page 61*
- Little Rock *volume 7 page 166*
- Mississippi *volume 8 page 142*
- Tennessee *volume 13 page 44*
- protest
- March on Washington *picture, volume 3 page 130*
- Montgomery bus boycott *picture, volume 8 page 177*
- Oklahoma restaurant *picture, volume 3 page 130*
- United States history *volume 14 page 31*
- civil service**
- Arthur *volume 1 page 193*
- civil war**
- war *volume 15 page 9*
- Civil War, English** (English history): *see in index* English Civil Wars
- Civil War, Spanish** (Spanish history): *see in index* Spanish Civil War
- Civil War** (U.S. history): *see in index* American Civil War
- cladding** (optical fibre component)
- fiber optics *volume 5 page 15, picture, volume 5 page 15*
- clam** (mollusk)
- shell *volume 12 page 80*
- clarinet** (musical instrument)
- wind instruments *picture, volume 8 page 217*
- Clark, Helen** (prime minister of New Zealand) *picture, volume 15 page 58*
- Clark, William** (U.S. explorer)
- Lewis and Clark Expedition *volume 7 page 137*
- diary *picture, volume 7 page 137*
- Missouri River *volume 8 page 149*
- Oregon Trail *volume 9 page 149*
- Clarke, Sir Arthur C.** (British author and scientist)
- science fiction *volume 12 page 51*
- class** (sociology): *see in index* social class
- classical age** (music)
- classical music *volume 3 page 132*
- classical music**
- MAIN ARTICLE *volume 3 page 131*
- MORE TO EXPLORE
- music *volume 8 page 214*
- classification, biological:** *see in index* taxonomy
- claw** (anatomy)
- MAIN ARTICLE *volume 9 page 4, picture, volume 9 page 4*
- MORE TO EXPLORE
- cheetah *volume 3 page 85*
- clay** (geology)
- MAIN ARTICLE *volume 3 page 132*
- MORE TO EXPLORE
- brick and tile *volume 2 page 128*
- adobe *volume 1 page 29*
- pipes *picture, volume 3 page 133*
- pottery *volume 10 page 138*
- Zuni potter *picture, volume 15 page 110*
- sculpture *volume 12 page 55*
- soil *volume 12 page 125*
- Clay, Cassius Marcellus** (U.S. abolitionist) *picture, volume 1 page 12*
- Clay, Cassius Marcellus** (U.S. boxer): *see in index* Ali, Muhammad
- Clay, Henry** (U.S. statesman) *picture, volume 8 page 148*
- Missouri Compromise *volume 8 page 148*
- claymation** (motion pictures)
- animation *volume 1 page 130*
- clay tablet** (writing) *picture, volume 15 page 77*
- Cleary, Beverly** (United States author)
- MAIN ARTICLE *volume 3 page 133, picture, volume 3 page 133*
- cleavage** (mineralogy)
- mineral *volume 8 page 132*
- Clemens, Samuel Langhorne** (U.S. author): *see in index* Twain, Mark
- Cleopatra** (queen of Egypt)
- MAIN ARTICLE *volume 3 page 134*
- MORE TO EXPLORE
- ancient Egypt *volume 4 page 115*
- bas relief portrait *picture, volume 3 page 134*
- pharaoh *volume 10 page 69*
- Cleveland** (city in Ohio, U.S.)
- Ohio *volume 9 page 126*
- Rock and Roll Hall of Fame *picture, volume 9 page 126*
- Cleveland, Grover** (president of the U.S.)
- MAIN ARTICLE *volume 3 page 135, picture, volume 3 page 136*
- MORE TO EXPLORE
- Harrison *volume 6 page 21*
- timeline *volume 3 page 135*
- Cleveland Indians** (U.S. baseball team)
- Paige *volume 10 page 6*
- click beetle** (insect)
- types of beetles *picture, volume 2 page 49*
- cliff** (landform)
- Blue Mountains *picture, volume 9 page 53*
- erosion *picture, volume 4 page 152*
- Petra *picture, volume 7 page 34*
- Cliff Dwellers** (Native American people): *see in index* Anasazi
- Cliff Palace** (ruins in Colorado, U.S.)
- picture, volume 1 page 114, picture, volume 3 page 158*
- climate**
- MAIN ARTICLE *volume 3 page 137*
- MORE TO EXPLORE
- clothing *volume 3 page 142*
- extinct animals *volume 1 page 126*
- climatology** (weather science)
- climate *volume 3 page 137*
- climbing** (locomotion)
- tree frog *picture, volume 1 page 110*
- Cline, Patsy** (U.S. singer)
- country music *volume 3 page 208*
- clinical psychology**
- psychology *volume 10 page 162*
- clinker** (cement production)
- cement *volume 3 page 69*

Clinton, Bill (president of the U.S.)

MAIN ARTICLE *volume 3 page 138, picture, volume 3 page 139*

MORE TO EXPLORE

presidential library *picture, volume 7 page 166*

signing peace agreement *picture, volume 10 page 19*

timeline *volume 3 page 138*

Clinton, Hillary Rodham (U.S. politician and first lady)

Clinton, Bill *volume 3 page 139*

clipper (sailing ship)

ship *volume 12 page 83*

cloaca (anatomy)

urinary system *volume 14 page 41*

frogs *picture, volume 14 page 41*

clock (timekeeping device)

MAIN ARTICLE *volume 3 page 140, picture, volume 11 page 86*

MORE TO EXPLORE

Banneker *volume 2 page 26*

pendulum *volume 10 page 52*

time *volume 13 page 69*

Clock Tower (tower of Westminster Palace in London, England, United Kingdom) *picture, volume 7 page 175***cloning** (biology)

genetics *volume 5 page 95*

closed-captioning system (communication)

deafness *volume 4 page 21*

cloth: *see in index* textile**clothing** (body covering)

MAIN ARTICLE *volume 3 page 141*

MORE TO EXPLORE

cultures

ancient Egypt *volume 4 page 113*

Cree *picture, volume 3 page 212*

Poland *picture, volume 10 page 108*

Potawatomi *picture, volume 10 page 138*

Qatar *picture, volume 11 page 4*

fibers *volume 5 page 17*

clothing industry

Industrial Revolution *volume 6 page 133*

cloud (weather)

MAIN ARTICLE *volume 3 page 142*

MORE TO EXPLORE

cirrus *picture, volume 3 page 142*

climate *volume 3 page 137*

cloud mistaken for a UFO *picture, volume 14 page 10*

rain *volume 11 page 22*

types *picture, volume 3 page 143*

cloud forest (ecology)

Central America *volume 3 page 74*

clover (plant): *see in index* shamrock**cloverleaf** (road design) *picture, volume 11 page 71***clover seed weevil** (insect)

types of beetles *picture, volume 2 page 49*

Clovis I (Frankish king)

Franks *volume 5 page 61*

clown (comedic entertainer)

circus *volume 3 page 120, picture, volume 3 page 119*

cluster bomb (military technology)

bomb *volume 2 page 104*

Clymene (Greek mythology)

Atlas *volume 1 page 222*

cm (measurement): *see in index* centimeter**coal** (fossil fuel)

MAIN ARTICLE *volume 3 page 144*

MORE TO EXPLORE

acid rain *volume 1 page 18*

coal mound in New Mexico, U.S. *picture, volume 5 page 56*

energy source *picture, volume 4 page 139*

fossil fuel *volume 5 page 55*

coal mining

coal *volume 3 page 144*

coal mined for fuel *picture, volume 5 page 56*

Kentucky *volume 7 page 57*

mining *volume 8 page 134*

Pennsylvania *volume 10 page 57*

Poland *picture, volume 3 page 144*

technology and invention *volume 13 page 26*

coast (landform)

harbor *volume 6 page 17*

Lake Superior *picture, volume 12 page 206*

Portugal *picture, volume 10 page 133*

tsunami *picture, volume 13 page 104*

Coast Mountains (mountains in North America) *picture, volume 2 page 133***Cobh** (city in Ireland)

Saint Coleman's Cathedral *picture, volume 3 page 61*

cobra (snake)

MAIN ARTICLE *volume 3 page 145, picture, volume 3 page 145*

MORE TO EXPLORE

Indian spectacled cobra *picture, volume 12 page 113*

mongoose *volume 8 page 165*

nest *volume 9 page 37*

snake *volume 12 page 112*

Cochegan Rock (rock formation in Montville, Connecticut, U.S.) *picture, volume 8 page 152***Cochin** (city in India)

Gama *volume 5 page 83*

Cochise (Apache chief)

MAIN ARTICLE *volume 3 page 145, picture, volume 3 page 146*

MORE TO EXPLORE

Apache *volume 1 page 144*

cochlea (anatomy)

ear *volume 4 page 87, picture, volume 4 page 87*

cockatiel (bird)

parrot family *volume 10 page 38*

cockatoo (bird)

parrot family *volume 10 page 38*

cocker spaniel, English (breed of dog): *see in index* English cocker spaniel**cockroach** (insect)

MAIN ARTICLE *volume 3 page 146, picture, volume 3 page 146*

cocoa (food) *picture, volume 3 page 108*

chocolate *volume 3 page 108*

São Tomé and Príncipe *volume 12 page 36*

cocoa (tree): *see in index* cacao**cocoa bean** *picture, volume 3 page 108*

chocolate *volume 3 page 108*

cocoa butter (vegetable fat)

chocolate *volume 3 page 108*

coconut (fruit)

palm *volume 10 page 20*

coconut milk

palm *volume 10 page 20*

cocoon (biology)

butterfly and moth *volume 2 page 158*

Monarch butterfly *picture, volume 2 page 158*

silk *volume 12 page 88*

silkworm spins cocoon *picture, volume 12 page 89*

cod (fish)

MAIN ARTICLE *volume 3 page 147, picture, volume 3 page 147*

Cod, Cape (peninsula in Massachusetts, U.S.)

boats in the water *picture, volume 8 page 73*

Massachusetts *volume 8 page 71*

code (law)

law *volume 7 page 117*

cod-liver oil

cod *volume 3 page 147*

Coelophysis (dinosaur)

dinosaurs in scale *picture, volume 4 page 53*

Coeur d'Alene (Native American people)

MAIN ARTICLE *volume 3 page 148*

MORE TO EXPLORE

Spokane people *volume 12 page 166*

Coeur d'Alene War (U.S. history, 1858):

see in index Spokane War

coffee (plant and beverage)

Colombia *picture, volume 3 page 153*

workers drying coffee in Kenya *picture, volume 7 page 58*

coffin (container for burial of a corpse)

ancient Egypt *volume 4 page 113*

coiled ceramics

pottery *volume 10 page 139*

coin (money)

ancient coins

Anglo-Saxon king *picture, volume 1 page 121*

Persephone *picture, volume 3 page 47*

Umayyad caliph *picture, volume 3 page 14*

money *volume 8 page 161*

cold, common (viral infection)

MAIN ARTICLE *volume 3 page 149*

MORE TO EXPLORE

cough *volume 3 page 207*

respiratory system *volume 11 page 56*

cold-bloodedness (zoology)

amphibians *volume 1 page 110*

fish *volume 5 page 27*

lizard *volume 7 page 169*

snake *volume 12 page 114*

cold desert (geography)

desert *volume 4 page 40*

Cold War (international political history)

MAIN ARTICLE *volume 3 page 150*

MORE TO EXPLORE

Berlin Wall *picture, volume 3 page 151*

communism *volume 3 page 168*

Kennedy *volume 7 page 54*

NATO *volume 9 page 84*

Soviet Union *volume 14 page 13*

United States *volume 14 page 31*

collard (plant and food)

cabbage *volume 3 page 4*

collective farm (Soviet agriculture)

Soviet Union *volume 14 page 13*

collie (breed of dog)

herding dogs *table, volume 4 page 62*

Collins, Michael (U.S. astronaut)

Armstrong *volume 1 page 189*

colobus (primate) *picture, volume 8*

page 167

Colombia (country in South America)

MAIN ARTICLE *volume 3 page 152*

MORE TO EXPLORE

Bolívar *volume 2 page 101*

geography

Bogotá *picture, volume 2 page 100*

coffee plantation *picture, volume 3 page 153*

Guáitara River *picture, volume 3 page 153*

Colombo (administrative capital of Sri Lanka)

MAIN ARTICLE *volume 3 page 154, picture, volume 3 page 154*

MORE TO EXPLORE

Sri Jayewardenepura Kotte *volume 12 page 173*

Sri Lanka *volume 12 page 174*

colon (anatomy): *see in index* large intestine**colonial America** (British and U.S. history): *see in index* American colonies**colonialism** (government policy)

colony *volume 3 page 154*

empire *volume 4 page 130*

Islam *volume 6 page 165*

places

Africa *volume 1 page 42*

Americas *picture, volume 1 page 105*

Florida *picture, volume 1 page 107*

Paramaribo *picture, volume 10*

page 32

United States *volume 14 page 27*

Asia *volume 1 page 204*

Europe *volume 4 page 164*

Germany *volume 5 page 106*

United Kingdom *volume 14 page 21*

trade *volume 13 page 89*

Colón Theatre (building in Buenos Aires, Argentina)

Buenos Aires *volume 2 page 146*

colony (animal society)

termite *volume 13 page 47*

wasp *volume 15 page 21*

colony (political unit)

MAIN ARTICLE *volume 3 page 154*

colony of occupation (colonialism)

colony *volume 3 page 154*

color

MAIN ARTICLE *volume 3 page 155*

MORE TO EXPLORE

light *volume 7 page 148, picture, volume 3 page 155*

mineral *volume 8 page 132*

prism *volume 10 page 153, picture, volume 10 page 153*

radiation *volume 11 page 17*

rainbow *volume 11 page 22*

Colorado (state in the U.S.)

MAIN ARTICLE *volume 3 page 157*

MORE TO EXPLORE

geography

Denver and the Rockies *picture, volume 4 page 39*

Mesa Verde National Park *picture, volume 3 page 158*

Colorado River (river in North America)

MAIN ARTICLE *volume 3 page 159, picture, volume 3 page 159*

MORE TO EXPLORE

Arizona *volume 1 page 178*

erosion *volume 4 page 152*

Grand Canyon *volume 5 page 136*
Hoover Dam *picture, volume 4 page 9*

color blindness (physiology)
blindness *volume 2 page 90*
color *volume 3 page 156*

Colosseum (arena in Rome, Italy)
ancient Rome *volume 11 page 88, picture, volume 11 page 90*
architecture *volume 1 page 169*
Rome *volume 11 page 87*

Columbia (state capital of South Carolina, U.S.)
MAIN ARTICLE *volume 3 page 160, picture, volume 3 page 160*

MORE TO EXPLORE
South Carolina *volume 12 page 147*

Columbia, District of (federal district, U.S.): *see in index* Washington, D.C.

“Columbia” (space shuttle)
space exploration *volume 12 page 152*

Columbia River (river in North America)
MAIN ARTICLE *volume 3 page 160, picture, volume 3 page 161*
MORE TO EXPLORE
Washington *volume 15 page 15*

Columbus (state capital of Ohio, U.S.)
MAIN ARTICLE *volume 3 page 161, picture, volume 3 page 162*
MORE TO EXPLORE
Ohio *volume 9 page 125*

Columbus, Bartholomew (Italian explorer)
Santo Domingo *volume 12 page 34*

Columbus, Christopher (Italian explorer)
MAIN ARTICLE *volume 3 page 162, picture, volume 3 page 162*
MORE TO EXPLORE

Americas *volume 1 page 103*
Arawak *volume 1 page 162*
Costa Rica *volume 3 page 203*
exploration *volume 4 page 174*
Honduras *volume 6 page 77*
Latin America *volume 7 page 112*
United States *volume 14 page 27*
Vespucci *volume 14 page 72*
West Indies *volume 15 page 33*
Bahamas *volume 2 page 8*
Cuba *volume 3 page 228*
Dominica *volume 4 page 65*

Dominican Republic *volume 4 page 66*
Jamaica *volume 7 page 10*
Puerto Rico *volume 10 page 165*
Trinidad and Tobago *volume 13 page 97*

Atlantic Ocean *volume 1 page 221*
Ferdinand and Isabella *volume 5 page 11*
Renaissance *volume 11 page 46*

coma (comet’s atmosphere)
comet *volume 3 page 166*

coma (medical disorder)
encephalitis *volume 4 page 133*

Comanche (Native American people)
MAIN ARTICLE *volume 3 page 164*
MORE TO EXPLORE
child wearing traditional dress *picture, volume 9 page 130*
Shoshone *volume 12 page 83*

comb (animal anatomy)
chicken *volume 3 page 95*

combine (farm equipment) *picture, volume 1 page 61*
wheat *volume 15 page 39*

Combs, Sean (U.S. rapper and music producer)
hip-hop *volume 6 page 59*

combustion (chemical reaction)
MAIN ARTICLE *volume 3 page 165*

combustion stroke (internal combustion)
internal-combustion engine *volume 6 page 141, picture, volume 6 page 140*

comedy (literature and theater)
drama *volume 4 page 73*
Shakespeare *volume 12 page 75*

comet (astronomy)
MAIN ARTICLE *volume 3 page 165, picture, volume 3 page 165*
MORE TO EXPLORE
meteor and meteorite *volume 8 page 108*
solar system *volume 12 page 128, picture, volume 12 page 127*

comet tail (astronomy)
comet *volume 3 page 166*

comic strip
cartoon *volume 3 page 49*

commensalism (biology)
symbiosis *volume 12 page 222, picture, volume 12 page 221*

Commerce, Department of (U.S. government agency)
United States government executive departments *table, volume 14 page 35*

commercial (promotion): *see in index* advertising

commercial fishing
bodies of water
Arctic Ocean *volume 1 page 173*
Bering Sea *volume 2 page 61*
Caribbean Sea *volume 3 page 41*
Great Lakes *volume 5 page 148*
Gulf of Mexico *volume 8 page 113*
North Sea *volume 9 page 92*
economic importance
Seychelles *volume 12 page 74*
Yukon *volume 15 page 98*

commissioned officer (military rank)
army *volume 1 page 189*

common adder (snake) *picture, volume 14 page 93*
various snakes *picture, volume 12 page 113*

common banana (plant and fruit)
banana *volume 2 page 19*

common barn owl (bird) *picture, volume 9 page 159*

common blue violet (plant) *picture, volume 14 page 92*
violet *volume 14 page 92*

common buzzard (bird)
claw and beak *picture, volume 2 page 80*

common carp (fish)
carp *volume 3 page 42*

common cuckoo (bird)
mimicry *volume 8 page 131*

common dolphin (mammal)
dolphin *volume 4 page 64*

common eland (mammal)
antelope types *picture, volume 1 page 139*

common garden iris (plant)
iris *volume 6 page 157*

common iguana (lizard)
iguana *volume 6 page 113*

common loon (bird) *picture, volume 7 page 176*

common mockingbird (bird) *picture, volume 8 page 150*
mockingbird *volume 8 page 150*

common raven (bird)
raven *volume 11 page 29*

Commons, House of (British government)
Parliament *volume 10 page 37*

“Common Sense” (pamphlet by Paine)
picture, volume 10 page 6
Declaration of Independence *volume 4 page 24*
Paine *volume 10 page 7*

common turkey (bird) *picture, volume 13 page 114*
turkey *volume 13 page 114*

commonwealth (political unit)
Puerto Rico *volume 10 page 165*

Commonwealth of Nations (association of nations)
Australia *volume 1 page 232*

commune (Chinese agricultural system)
Mao *volume 8 page 48*

communicable disease: *see in index*
infectious disease

communication
MAIN ARTICLE *volume 3 page 166*

MORE TO EXPLORE

animals

bird *volume 2 page 78*

birdsong *picture, volume 3 page 167*

zebra *volume 15 page 103*

humans

cell phone and laptop computer use
picture, volume 3 page 166

postal service *volume 10 page 136*

communications satellite (artificial orbiting object)
satellite *volume 12 page 41*

Communion (Christianity)
Christianity *volume 3 page 113*
Roman Catholicism *volume 11 page 83, picture, volume 11 page 82*

communism (political and economic system)
MAIN ARTICLE *volume 3 page 167*

MORE TO EXPLORE

capitalism *volume 3 page 35*

countries and regions

Americas, the

Cuba *volume 3 page 227*

United States *volume 14 page 31*

Asia

China *volume 3 page 104*

North Korea *volume 7 page 81*

Vietnam *volume 14 page 85, volume 14 page 86*

Europe *volume 4 page 164*

Balkan Peninsula *volume 2 page 13*

Czechoslovakia *volume 3 page 238, volume 10 page 142*

Germany *volume 2 page 62, volume 5 page 107*

Hungary *volume 6 page 102*

Poland *volume 10 page 109*

refugee *volume 11 page 41*

Romania *volume 11 page 85*

Russia and Soviet Union *volume 11 page 107, volume 14 page 10*

economics *volume 4 page 101*

events

Cold War *volume 3 page 150*

Korean War *volume 7 page 85*

Russian Revolution *volume 11 page 108*

labor *volume 7 page 98*

NATO *volume 9 page 84*

people

Castro *volume 3 page 54*

Lenin *volume 7 page 129*

Mao *volume 8 page 48, picture, volume 8 page 48*

Marx *picture, volume 3 page 168*

Stalin *volume 12 page 176*

socialism *volume 12 page 120*

Communist Party of the Soviet Union
Gorbachev *volume 5 page 128*

commuter train (railroad)
railroad *volume 11 page 20*

Comoros (island country in the Indian Ocean)

MAIN ARTICLE *volume 3 page 169*

MORE TO EXPLORE

Moroni harbor *picture, volume 8 page 185*

compact bone (anatomy)
arm *picture, volume 2 page 106*
bone *volume 2 page 106*

compact disc (digital recording media)
MAIN ARTICLE *volume 3 page 170, picture, volume 3 page 170*

MORE TO EXPLORE

laser *volume 7 page 111*

sound recording *volume 12 page 135*

compact disc player (sound-reproduction device)
compact disc *volume 3 page 170*

compact disc read-only memory (computing): *see in index* CD-ROM

comparative psychology
psychology *volume 10 page 162*

compass (navigation instrument)
MAIN ARTICLE *volume 3 page 170, picture, volume 3 page 171, picture, volume 9 page 24*

MORE TO EXPLORE

magnet *volume 8 page 19*

navigation *volume 9 page 24*

compass chart (navigational chart): *see in index* portolan

competition (economics)
retail business *picture, volume 3 page 34*

complex volcano (geology)
volcanic landforms *picture, volume 14 page 101*
volcano *volume 14 page 101*

composer (music)
classical music *volume 3 page 131*

composite bow (weapon)
various bows *picture, volume 1 page 166*

composting
recycling *volume 11 page 35*

compound eye (anatomy)
insect anatomy *picture, volume 6 page 138*

compound fracture (of bone) *picture, volume 2 page 106*
bone *volume 2 page 106*

compound machine
machine *volume 8 page 7*
mechanic and jet engine *picture, volume 8 page 7*

compound microscope (scientific instrument) *picture, volume 8 page 120*
microscope *volume 8 page 120*

Comprehensive Test-Ban Treaty (United Nations, 1996)

bomb *volume 2 page 105*

compression stroke (internal combustion)

internal-combustion engine *volume 6 page 141*, picture, *volume 6 page 140*

Compsognathus (dinosaur)

dinosaur picture, *volume 4 page 53*

computer

MAIN ARTICLE *volume 3 page 171*, picture, *volume 3 page 171*

MORE TO EXPLORE

artificial intelligence *volume 1 page 195*, picture, *volume 1 page 195*

basic parts of a computer picture, *volume 3 page 172*

book and bookmaking *volume 2 page 109*

compact disc *volume 3 page 170*

computer chip picture, *volume 3 page 174*

drawing *volume 4 page 75*

electronic calculator picture, *volume 9 page 106*

hobby *volume 6 page 66*

laptop computer picture, *volume 3 page 172*

laptop with webcam picture, *volume 6 page 142*

newspaper *volume 9 page 55*

robot *volume 11 page 74*

weather *volume 15 page 28*

computer animation (motion pictures)

animation *volume 1 page 130*

movie *volume 8 page 199*

“Toy Story” picture, *volume 1 page 130*

computer chip (electronics): *see in index* integrated circuit

computer game: *see in index* electronic game

computer hardware (computing): *see in index* hardware

computer memory

computer *volume 3 page 172*

computer program

artificial intelligence *volume 1 page 195*

computer *volume 3 page 173*

computer programming language

computer *volume 3 page 173*

computer software: *see in index* computer program

Conakry (capital city of Guinea)

MAIN ARTICLE *volume 3 page 174*

MORE TO EXPLORE

Guinea *volume 5 page 169*

concave lens (optics) picture, *volume 7 page 130*

lens *volume 7 page 130*

nearsightedness correction picture, *volume 7 page 131*

concave mirror (reflective surface)

mirror *volume 8 page 139*

concentration camp

Holocaust *volume 6 page 71*

concentric castle (military architecture)

castle *volume 3 page 54*, picture, *volume 3 page 53*

conch (mollusk)

shell *volume 12 page 80*

Concord (state capital of New Hampshire, U.S.)

MAIN ARTICLE *volume 3 page 175*

MORE TO EXPLORE

New Hampshire *volume 9 page 47*

State House picture, *volume 3 page 175*

Concord, Battle of (American Revolution, 1775): *see in index* Lexington and Concord, Battles of

concrete (building material)

MAIN ARTICLE *volume 3 page 175*, picture, *volume 3 page 68*

MORE TO EXPLORE

architecture *volume 1 page 168*

cement *volume 3 page 68*

reinforced concrete slab picture, *volume 3 page 176*

road *volume 11 page 70*

sculpture *volume 12 page 55*

condensation (phase change)

MAIN ARTICLE *volume 4 page 166*

MORE TO EXPLORE

dew *volume 4 page 42*

rain *volume 11 page 22*

conduction (physics)

heat *volume 6 page 32*

cone (plant part)

conifer *volume 3 page 182*, picture, *volume 10 page 95*

fir *volume 5 page 24*

Lawson cypress picture, *volume 13*

page 94

pine *volume 10 page 86*

cone (eye part)

color *volume 3 page 156*

eye *volume 4 page 176*

Confederate States of America (U.S. history)

MAIN ARTICLE *volume 3 page 176*

MORE TO EXPLORE

American Civil War *volume 1 page 96*

important people

Davis *volume 4 page 18*

Grant *volume 5 page 137*

Lincoln *volume 7 page 155*

important places

Alabama *volume 1 page 61*

Florida *volume 5 page 36*

Mississippi *volume 8 page 142*

Montgomery *volume 8 page 177*

United States *volume 14 page 29*

Virginia *volume 14 page 96*

Richmond *volume 11 page 64*

Reconstruction *volume 11 page 33*

Confederation, Articles of (U.S. history, 1781-89): *see in index* Articles of Confederation

Confederation Bridge (bridge in Canada) picture, *volume 10 page 151*

“Confessions of Nat Turner, The” (book by Gray)

title page picture, *volume 13 page 116*

Confucianism (Chinese philosophy)

Confucius *volume 3 page 178*

Confucius (Chinese teacher and philosopher)

MAIN ARTICLE *volume 3 page 178*, picture, *volume 3 page 178*

conger eel (fish)

Conger oceanicus picture, *volume 4 page 107*

eel *volume 4 page 107*

Congo, Brazzaville (country in Africa): *see in index* Congo, Republic of the

Congo, Democratic Republic of the (country in Africa)

MAIN ARTICLE *volume 3 page 179*

MORE TO EXPLORE

elephants picture, *volume 3 page 180*

fishing in Congo River picture, *volume 3 page 180*

shop in Kinshasa *picture, volume 7 page 69*

Congo, Republic of the (country in Africa)

MAIN ARTICLE *volume 3 page 181*

MORE TO EXPLORE

Brazzaville church service *picture, volume 2 page 128*

Congo peacock (bird)

peacock *volume 10 page 46*

Congo River (river in Africa)

Democratic Republic of the Congo *volume 3 page 179*

Enya people fishing *picture, volume 3 page 180*

Congregationalism (Christian movement)

Puritans *volume 10 page 169*

Congress (U.S. government): *see in index* Congress of the United States

Congress, Library of (library in Washington, D.C., U.S.)

Washington, D.C. *volume 15 page 18*

Congress of Industrial Organizations (labor organization)

labor *volume 7 page 97*

Congress of Racial Equality (U.S. organization): *see in index* Racial Equality, Congress of

Congress of the United States

joint session to hear a foreign leader *picture, volume 14 page 33*

legislature *volume 7 page 124*

United States Capitol *picture, volume 15 page 18*

Congress Party (political party in India): *see in index* Indian National Congress

conifer (tree and shrub)

MAIN ARTICLE *volume 3 page 182, picture, volume 3 page 183*

MORE TO EXPLORE

biome *volume 2 page 74*

cone *picture, volume 10 page 95*

forest *picture, volume 3 page 182*

plant *volume 10 page 96*

taiga *volume 13 page 5*

tree *volume 13 page 94*

Conkling, Roscoe (U.S. politician)

Garfield *volume 5 page 88*

Connecticut (state in the U.S.)

MAIN ARTICLE *volume 3 page 184*

MORE TO EXPLORE

geography

church in autumn *picture, volume 3 page 117*

Mark Twain home *picture, volume 3 page 185*

Mystic Seaport *picture, volume 3 page 185*

State Capitol *picture, volume 6 page 24*

Connecticut River (river in the U.S.)

Connecticut *volume 3 page 184*

conning tower (naval technology)

submarine *picture, volume 12 page 197*

conquistador (Spanish history)

MAIN ARTICLE *volume 3 page 186, picture, volume 3 page 186*

conservation (protection of nature)

MAIN ARTICLE *volume 3 page 186*

MORE TO EXPLORE

carpooling *picture, volume 3 page 187*

hybrid car *picture, volume 1 page 237*

recycling *volume 3 page 186*

tree replanting *picture, volume 3 page 187*

Conservative Judaism

Judaism *volume 7 page 38*

console (computing)

electronic games *volume 4 page 121*

Constable, John (British artist)

painting *volume 10 page 10*

Constantine the Great (Roman emperor)

ancient Rome *volume 11 page 90*

gladiator *volume 5 page 118*

Istanbul *volume 6 page 171*

Constantinople (historic city in Turkey): *see in index* Istanbul

constellation (astronomy)

MAIN ARTICLE *volume 3 page 188*

MORE TO EXPLORE

Orion *picture, volume 3 page 188*

zodiac *volume 15 page 107*

Constitución, Plaza de la (plaza in Mexico City, Mexico): *see in index* Zócalo

constitution (government and law)

MAIN ARTICLE *volume 3 page 189*

MORE TO EXPLORE

government *volume 5 page 131, picture, volume 5 page 132*

United States Constitution *picture, volume 3 page 189*

“Constitution” (ship) *picture, volume 2 page 114*

War of 1812 *volume 15 page 13, picture, volume 15 page 13*

Constitutional Convention (U.S. history) *picture, volume 14 page 32*

New Jersey *volume 9 page 50*

constitutional monarchy (form of government)

democracy *volume 4 page 35*

government *volume 5 page 132*

monarchy *volume 8 page 159*

United Kingdom *picture, volume 14 page 18*

Constitution of the United States of America: *see in index* United States Constitution

constriction (feeding behavior)

snake *volume 12 page 114*

construction (building or assembly of large structures)

applied math *picture, volume 8 page 77*

canal *volume 3 page 27*

industry *volume 6 page 135*

consul (ancient Roman official)

ancient Rome *volume 11 page 89*

Consulate (French history)

French Revolution *volume 5 page 70*

consumer (biology)

ecosystem *volume 4 page 101*

food chain *volume 5 page 45*

contact force (physics)

force *volume 5 page 50*

contagious disease: *see in index* infectious disease

container ship (transportation) *picture, volume 10 page 5*

ship *volume 12 page 82*

continent (landform)

MAIN ARTICLE *volume 3 page 190*

MORE TO EXPLORE

plate tectonics *volume 10 page 98*

Continental Army (U.S. history)

Washington *volume 15 page 20*

Continental Congress (U.S. history, 1774-89)

MAIN ARTICLE *volume 3 page 191*

MORE TO EXPLORE

American Revolution *volume 1 page 99*

Articles of Confederation *volume 1 page 195*

Declaration of Independence *volume 4 page 23*

First Continental Congress *picture, volume 3 page 191*

Henry *volume 6 page 40*

Independence Day *volume 6 page 122*

Madison *volume 8 page 11*

Monroe *volume 8 page 171*

continental drift (geology)

plate tectonics *volume 10 page 98*

continental island (geology)

island *volume 6 page 167*

Seine River *picture, volume 6 page 167*

continental shelf (marine geology)

ocean *volume 9 page 118*

continuing education: *see in index* adult education**Contra** (Nicaraguan guerrilla)

Nicaragua *volume 9 page 64*

contractile vacuole (cell part)

amoeba *volume 1 page 108*

contraction (birthing)

reproductive system *volume 11 page 50*

convection (physics)

heat *volume 6 page 32*

convent (housing for religious order): *see in index* monastery**convex lens** (optics) *picture, volume 7 page 130*

farsightedness correction *picture, volume 7 page 131*

lens *volume 7 page 130*

convex mirror (reflective surface)

mirror *volume 8 page 139*

convict labor

Tasmania *picture, volume 13 page 20*

Conwy Castle (castle in Wales, United Kingdom) *picture, volume 15 page 4***Cook, James** (British naval officer and explorer)

MAIN ARTICLE *volume 3 page 192, picture, volume 3 page 192*

MORE TO EXPLORE

Australia *volume 1 page 231*

Victoria *volume 14 page 78*

British Columbia *volume 2 page 133*

exploration *volume 4 page 174*

New South Wales *volume 9 page 54*

New Zealand *volume 9 page 62*

Oceania *volume 9 page 122*

Pacific Ocean *volume 10 page 5*

Cook, Mount (mountain in New Zealand)

New Zealand *volume 9 page 61*

“Cookie Monster” (television character)

parade balloon *picture, volume 2 page 15*

cooking

peppers on a grill *picture, volume 6 page 32*

Coolidge, Calvin (president of the U.S.)

MAIN ARTICLE *volume 3 page 194, picture, volume 3 page 194*

MORE TO EXPLORE

timeline *volume 3 page 194*

Coolidge, Grace (first lady of the U.S.)

Coolidge, Calvin *volume 3 page 194*

cooperative (organization)

moshav in Israel *picture, volume 6 page 169*

Cooper's hawk (bird)

hawk *volume 6 page 28*

Cooperstown (city in New York, U.S.)

baseball *volume 2 page 32*

Copenhagen (capital city of Denmark)

MAIN ARTICLE *volume 3 page 195, picture, volume 4 page 37*

MORE TO EXPLORE

Denmark *volume 4 page 36*

Little Mermaid statue *picture, volume 3 page 196*

Copernicus, Nicolaus (Polish astronomer)

MAIN ARTICLE *volume 3 page 196, picture, volume 3 page 196*

MORE TO EXPLORE

astronomy *volume 1 page 215*

Galileo *volume 5 page 82*

Renaissance *volume 11 page 45*

copper (chemical element)

brass *volume 2 page 123*

bronze *volume 2 page 134*

mining *volume 8 page 134*

Copperfield, David (U.S. magician)

magic *volume 8 page 17*

coral (marine animal)

MAIN ARTICLE *volume 3 page 197, picture, volume 3 page 197*

MORE TO EXPLORE

Great Barrier Reef *volume 5 page 145, picture, volume 5 page 145*

longnose hawkfish *picture, volume 4 page 171*

coral atoll (reef and landform)

formation *picture, volume 6 page 167*

island *volume 6 page 167*

Kiribati *volume 7 page 71, picture, volume 2 page 10*

Majuro *volume 8 page 24*

coral island (geology)

Pacific Ocean landform *picture, volume 10 page 4*

coralline islands group (islands of Seychelles)

Seychelles *volume 12 page 74*

coral reef (geology)

Caribbean Sea *volume 3 page 41*

coral *volume 3 page 197*

images

coral reef *picture, volume 6 page 167*

Marshall Islands *picture, volume 8 page 24*

Red Sea *picture, volume 11 page 37*

Solomon Islands *picture, volume 12 page 129*

Coral Sea, Battle of the (Japanese-U.S. history)

World War II *volume 15 page 69*

coral snake

MAIN ARTICLE *volume 3 page 198, picture, volume 3 page 198*

Corbusier, Le (Swiss architect)

architecture *volume 1 page 172*

cordless telephone

telephone *volume 13 page 36*

core (Earth)

Earth *volume 4 page 89, picture, volume 4 page 89*

cork (tree bark of the cork oak)

MAIN ARTICLE *volume 3 page 198*, *picture*, *volume 3 page 199*

cork oak (tree) *picture*, *volume 3 page 199*
cork *volume 3 page 198*

corn (grain)

MAIN ARTICLE *volume 3 page 199*

MORE TO EXPLORE

early growth *picture*, *volume 6 page 146*
tasseled corn *picture*, *volume 3 page 199*

cornea (eye part)

eye *volume 4 page 175*, *picture*, *volume 4 page 175*

Cornplanter (Seneca leader) *picture*, *volume 12 page 65*

Cornwallis, Charles (British general and statesman)
American Revolution *volume 1 page 102*

corolla (plant part)

flower *volume 5 page 38*, *picture*, *volume 5 page 38*

corona (sun feature)

solar eclipse *picture*, *volume 4 page 98*
sun *volume 12 page 203*, *picture*, *volume 12 page 203*

Coronado, Francisco (Spanish adventurer)

MAIN ARTICLE *volume 3 page 200*

MORE TO EXPLORE

New Mexico *volume 9 page 52*

Cortés, Hernán (Spanish conquistador)

MAIN ARTICLE *volume 3 page 201*

MORE TO EXPLORE

Aztecs *volume 1 page 240*
chocolate *volume 3 page 109*
conquistador *volume 3 page 186*
Cortés leading a group of Tlaxcala to Tenochtitlán *picture*, *volume 3 page 201*
Mexico *volume 8 page 111*
Mexico City *volume 8 page 114*

cortex (plant tissue)

root *volume 11 page 96*, *picture*, *volume 11 page 96*

Cortez, Hernando (Spanish conquistador): *see in index* Cortés, Hernán

cosmetic

MAIN ARTICLE *volume 3 page 202*, *picture*, *volume 3 page 202*

cosmic ray (physics)

radiation *volume 11 page 18*

cosmonaut (space explorer): *see in index* astronaut

Cossack (Russian and Ukrainian people)
Ukraine *volume 14 page 7*

Costa Rica (country in Central America)

MAIN ARTICLE *volume 3 page 203*

MORE TO EXPLORE

capuchin monkey *picture*, *volume 3 page 74*
San José *picture*, *volume 12 page 28*

Côte d'Ivoire (country in Africa)

MAIN ARTICLE *volume 3 page 204*

MORE TO EXPLORE

Abidjan *volume 1 page 9*, *picture*, *volume 1 page 10*
Yamoussoukro Basilica *picture*, *volume 15 page 85*

Cotonou (city in Benin)

MAIN ARTICLE *volume 3 page 205*

MORE TO EXPLORE

women and children carrying goods *picture*, *volume 3 page 205*

Cotopaxi (volcano in Ecuador) *picture*, *volume 4 page 103*

Cotswolds (hills in England, United Kingdom)

sheep grazing *picture*, *volume 4 page 140*

cotton (plant and fiber)

MAIN ARTICLE *volume 3 page 205*

MORE TO EXPLORE

clothing *volume 3 page 142*
fibers *volume 5 page 16*
harvesting *picture*, *volume 1 page 61*, *picture*, *volume 3 page 206*
Indus Valley civilization *volume 6 page 135*
Pakistan *picture*, *volume 10 page 14*
South Carolina *volume 12 page 148*
Uzbekistan *volume 14 page 47*

cotton gin (machine) *picture*, *volume 15 page 43*

cotton *volume 3 page 206*
Industrial Revolution *volume 6 page 133*
Whitney *volume 15 page 42*

cottonseed

cotton *volume 3 page 206*

cottonwood (tree)

poplar *volume 10 page 126*

Coubertin, Pierre de (French educator and sportsman)

Olympic Games *volume 9 page 134*

cougar (mammal): *see in index* puma

cough (reflex)

MAIN ARTICLE *volume 3 page 206*

Counter-Reformation (religious history)
Reformation *volume 11 page 39*

counting number (mathematics): *see in index* natural number

country (politics): *see in index* nation

country music

MAIN ARTICLE *volume 3 page 208*

Country Music Hall of Fame and Museum (museum in Nashville, Tennessee, U.S.) *picture*, *volume 9 page 10*

coup d'état (government)

dictatorship *volume 4 page 46*

Courbet, Gustave (French artist)

painting *volume 10 page 10*

court (law)

law *volume 7 page 117*
Navajo Supreme Court *picture*, *volume 5 page 132*

court (sports)

basketball *picture*, *volume 2 page 34*
tennis *volume 13 page 45*, *picture*, *volume 13 page 45*
volleyball *volume 14 page 104*

court ballet (dance)

ballet *volume 2 page 14*

covered bridge (construction)

Hartland *picture*, *volume 9 page 43*

cow (animal)

cattle *volume 3 page 61*
four animal skeletal systems *picture*, *volume 12 page 95*
India *volume 6 page 124*

cowbird (bird)

MAIN ARTICLE *volume 3 page 209*, *picture*, *volume 3 page 209*

cowboy

rodeo in Wyoming *picture*, *volume 15 page 80*
Texas *volume 13 page 52*

cowpox (virus)vaccine *volume 14 page 49***coyote** (mammal)MAIN ARTICLE *volume 3 page 209*, picture, *volume 3 page 210***CPU** (computer): *see in index* central processing unit**crab** (animal)hermit crab *picture, volume 3 page 225*
shell *volume 12 page 80***cradleboard**Apache *picture, volume 1 page 144*
Crow *picture, volume 3 page 221***craftsman-handyman-trader nomad**nomad *volume 9 page 76***cranberry** (plant and fruit)MAIN ARTICLE *volume 3 page 210*, picture, *volume 3 page 210***crane** (bird)origami *picture, volume 6 page 60*
Platte River migration *picture, volume 9 page 29***crane** (machine) *picture, volume 8 page 7***cranium** (part of skull)skull *volume 12 page 103***crankshaft** (engine component)internal-combustion engine *volume 6 page 141*, picture, *volume 6 page 140***crash** (economics)stock exchange *volume 12 page 186***crater** (landform)Crater Viti *picture, volume 6 page 108*
Mercury *volume 8 page 102*
Meteor Crater *picture, volume 8 page 108*
Moon *volume 8 page 178***crawl** (swimming): *see in index* freestyle**Crazy Horse** (Sioux chief)MAIN ARTICLE *volume 3 page 211*, picture, *volume 3 page 211*

MORE TO EXPLORE

Sioux *volume 12 page 92***creationism**evolution *volume 4 page 169***creation myth**Odin *volume 9 page 124***Cree** (Native American people)MAIN ARTICLE *volume 3 page 211*

MORE TO EXPLORE

Algonquian *volume 1 page 80*
Cree traditional costume *picture, volume 3 page 212*
Manitoba *volume 8 page 44*
Native Americans *volume 9 page 18*
Ontario *volume 9 page 140*
Quebec *volume 11 page 9*
Saskatchewan *volume 12 page 39*
traditional costume *picture, volume 3 page 212***Creek** (Native American people)MAIN ARTICLE *volume 3 page 212*

MORE TO EXPLORE

Me-Na-Wa, Creek chief *picture, volume 3 page 212*
Native Americans *volume 9 page 16*
Osceola *volume 9 page 153***cremation** (funeral custom)death *volume 4 page 22***Creole** (people)Guadeloupe *volume 5 page 164*
Louisiana *volume 7 page 180*
Mauritius *volume 8 page 80*
Suriname *volume 12 page 208***creole language**Haiti *volume 6 page 8*
Jamaica *volume 7 page 10*
language *volume 7 page 105***crest-tailed marsupial mouse** (mammal)marsupial *picture, volume 8 page 63***Crete** (island in Greece)Aegean civilization *volume 1 page 33*
ancient Greece *volume 5 page 154*
olive *volume 9 page 131***Crick, Francis** (British biophysicist)genetics *volume 5 page 95***cricket** (insect)MAIN ARTICLE *volume 3 page 213*, picture, *volume 3 page 213***cricket** (sport)MAIN ARTICLE *volume 3 page 214*, picture, *volume 3 page 214*, picture, *volume 3 page 215***crime** (law)MAIN ARTICLE *volume 3 page 215*

MORE TO EXPLORE

capital punishment *volume 3 page 35*police *volume 10 page 111*prison *picture, volume 3 page 216***Crimea** (region and peninsula in the Ukraine)MAIN ARTICLE *volume 3 page 217*, picture, *volume 14 page 6*

MORE TO EXPLORE

Black Sea *volume 2 page 89***crime against humanity**Nuremberg trials *volume 9 page 110***crime against peace**Nuremberg trials *volume 9 page 110***Crimean War** (European history)Nightingale *volume 9 page 71***criminal law**law *volume 7 page 117***Crioulo** (language)Cape Verde *volume 3 page 33***Croatia** (country in Europe)MAIN ARTICLE *volume 3 page 218*, picture, *volume 3 page 218*, picture, *volume 3 page 219*

MORE TO EXPLORE

Serbia *volume 12 page 72*
Yugoslavia *volume 15 page 95*
Zagreb *picture, volume 15 page 100***Crockett, Davy** (U.S. frontiersman and politician)MAIN ARTICLE *volume 3 page 220*, picture, *volume 3 page 220***crocodile** (reptile)MAIN ARTICLE *volume 3 page 220*, picture, *volume 11 page 51*

MORE TO EXPLORE

alligator *volume 1 page 85*
four animal skeletal systems *picture, volume 12 page 95*
leg *picture, volume 7 page 123*
reptile *volume 11 page 51*
snout *picture, volume 1 page 85*, picture, *volume 3 page 221*
tail *volume 13 page 6***Cromwell, Oliver** (English statesman)Puritans *volume 10 page 169***Cronus** (Greek mythology)Demeter *volume 4 page 34*
Hades *volume 6 page 5*
Hera *volume 6 page 43*
Titans *volume 13 page 70*
Zeus *volume 15 page 104*

crop (animal anatomy)
bird *volume 2 page 77*

crop (farming)
agriculture *volume 1 page 48*

crossbow (weapon) *picture, volume 15 page 26*
archery *volume 1 page 166*
various bows *picture, volume 1 page 166*
weapon *volume 15 page 25*

cross-country running (sports)
track and field *volume 13 page 86*

cross-country skiing (sports)
skiing *volume 12 page 98*

crosse (sports equipment)
lacrosse *volume 7 page 100, picture, volume 7 page 100*

cross-pollination (botany) *picture, volume 10 page 117*
flower *volume 5 page 38*
pollen *volume 10 page 116*

Crow (Native American people)
MAIN ARTICLE *volume 3 page 221*
MORE TO EXPLORE
Crow woman holding her child *picture, volume 3 page 221*

crow (bird)
MAIN ARTICLE *volume 3 page 222, picture, volume 3 page 222*
MORE TO EXPLORE
raven *volume 11 page 29*

crown (headwear)
crown of Queen Victoria *picture, volume 7 page 24*

crown (civil engineering)
road *volume 11 page 70*

crown (tooth)
teeth *volume 13 page 31*

crown of Queen Victoria (British crown)
picture, volume 7 page 24

Crucifixion (Christianity)
Easter *volume 4 page 93*

crude petroleum
petroleum *volume 10 page 68*

cruiser (warship)
navy *volume 9 page 25*

cruise ship *picture, volume 13 page 93*
Bahamas, The *picture, volume 2 page 8*

pleasure boats in harbor *picture, volume 12 page 82*
ship *volume 12 page 82*

Crusades (European, Christian and Islamic history)
MAIN ARTICLE *volume 3 page 223, picture, volume 3 page 223*

MORE TO EXPLORE
Children's Crusades *picture, volume 3 page 224*
Christianity *volume 3 page 114*
fortress in Syria *picture, volume 12 page 224*
Islam *volume 6 page 165*
Middle Ages *volume 8 page 123*
knight *volume 7 page 74*
pilgrimage *volume 10 page 85*

crushed stone (mining)
quarrying *volume 11 page 7*

crust (Earth)
Earth *volume 4 page 89, picture, volume 4 page 89*
earthquake *volume 4 page 91*
rock *volume 11 page 75*

crustacean (animal)
MAIN ARTICLE *volume 3 page 224*
MORE TO EXPLORE
shell *volume 12 page 80*

crystal (physics)
MAIN ARTICLE *volume 3 page 226, picture, volume 3 page 226, picture, volume 3 page 226*
MORE TO EXPLORE
snow *volume 12 page 115*

Cuba (island country in the West Indies)
MAIN ARTICLE *volume 3 page 227*
MORE TO EXPLORE
Havana *picture, volume 3 page 228*
history
Castro *volume 3 page 54*
Cold War *volume 3 page 151, picture, volume 3 page 150*
Cortés *volume 3 page 201*
refugee *volume 11 page 41*
Spanish-American War: *see in index*
Spanish-American War
musicians *picture, volume 3 page 228*
volleyball tournament *picture, volume 14 page 104*

Cuban American (people)
Hispanic American *volume 6 page 62*

Miami's Little Havana *picture, volume 6 page 62*

Cuban missile crisis (Cold War history, 1962)
Cold War *volume 3 page 151*
Cuba *volume 3 page 228*
Kennedy *volume 7 page 54*
U.S. ship stopping a Soviet ship *picture, volume 3 page 150*

cube (mathematics)
crystal *volume 3 page 226*
geometry *volume 5 page 99*

cubism (artistic style)
painting *volume 10 page 11*
Picasso *volume 10 page 80*
Rivera *volume 11 page 69*

cuckoo (bird)
MAIN ARTICLE *volume 3 page 229, picture, volume 3 page 229*

cucumber (plant)
MAIN ARTICLE *volume 3 page 229, picture, volume 3 page 229*

cucumber tree (plant)
magnolia *volume 8 page 20*

cud (digestion)
cattle *volume 3 page 62*
deer *volume 4 page 27*
goat *volume 5 page 121*
sheep *volume 12 page 79*

Cugnot, Nicolas-Joseph (French engineer)
automobile history *volume 1 page 236*

culm (bamboo stem)
bamboo *volume 2 page 18*

cultural anthropology (science)
anthropology *volume 1 page 141*

Cultural Revolution (Chinese political movement)
China *volume 3 page 104*
Mao *volume 8 page 48*

culture
MAIN ARTICLE *volume 3 page 230*
MORE TO EXPLORE
mythology *picture, volume 8 page 222*

Cumberland Gap (mountain pass in the U.S.)
MAIN ARTICLE *volume 3 page 231, picture, volume 3 page 231*

MORE TO EXPLORE

Boone *volume 2 page 111*
 Kentucky *volume 7 page 57*

Cumberland Gap National Historical Park (in the eastern U.S.)
 Cumberland Gap *volume 3 page 231*

cumulus cloud

cloud *volume 3 page 144*, *picture, volume 3 page 143*

cuneiform writing

Mesopotamia *volume 8 page 104*
 writing *volume 15 page 77*, *picture, volume 15 page 77*

cup (unit of measurement)

measurement *volume 8 page 89*

Curie, Irène (French chemist): *see in index* Joliot-Curie, Irène

Curie, Marie (French physicist) *picture, volume 3 page 232*
 Curie family *volume 3 page 232*

Curie, Pierre (French chemist)
 Curie family *volume 3 page 232*

Curie family (French scientists)
 MAIN ARTICLE *volume 3 page 231*

currency (economics) *picture, volume 8 page 160*
 euro *picture, volume 4 page 165*

Cush (ancient African kingdom): *see in index* Kush

cuspid (tooth)

teeth *volume 13 page 30*

Custer, George Armstrong (U.S. military officer)
 MAIN ARTICLE *volume 3 page 233*, *picture, volume 3 page 233*

MORE TO EXPLORE

Crazy Horse *volume 3 page 211*
 Sitting Bull *volume 12 page 93*

Cuzco (city in Peru)
 Incan fortress *picture, volume 6 page 121*
 Incas *volume 6 page 121*

cyan (color)

light *picture, volume 3 page 155*
 pigment *picture, volume 3 page 156*

cycling (sport)

MAIN ARTICLE *volume 3 page 234*, *picture, volume 3 page 234*, *picture, volume 3 page 234*

cyclone (weather)

storm *volume 12 page 192*

cyclonic climate

climate *volume 3 page 138*

cygnet (baby swan)

adult swans with cygnets *picture, volume 12 page 210*

cylinder (engine component)

internal-combustion engine *volume 6 page 141*

Cymru (part of the United Kingdom): *see in index* Wales

cypress (tree and shrub)

MAIN ARTICLE *volume 3 page 235*, *picture, volume 3 page 235*

MORE TO EXPLORE

Florida *picture, volume 13 page 12*
 Lawson cypress *picture, volume 13 page 94*

Cyprus (island country in the Mediterranean Sea)

MAIN ARTICLE *volume 3 page 236*, *picture, volume 3 page 236*, *picture, volume 3 page 237*

MORE TO EXPLORE

mosque in Nicosia *picture, volume 9 page 66*
 Turkey *volume 13 page 113*

Cyrillic alphabet

alphabet *volume 1 page 89*

cytoplasm (cell part)

cell *volume 3 page 66*
 animal *picture, volume 3 page 66*
 plant *picture, volume 3 page 67*
 protozoan *volume 10 page 160*

cytosine (chemical compound)

DNA *volume 4 page 61*

czar (Russian ruler): *see in index* tsar

Czech (people)

Czechoslovakia *volume 3 page 238*

Czechoslovakia (historic country in Europe)

MAIN ARTICLE *volume 3 page 238*

MORE TO EXPLORE

Czech Republic *volume 3 page 240*
 Prague *volume 10 page 142*
 Slovakia *volume 12 page 109*
 World War II *volume 15 page 65*

Czech Republic (country in Europe)

MAIN ARTICLE *volume 3 page 239*

MORE TO EXPLORE

Czechoslovakia *volume 3 page 238*
 geography
 countryside *picture, volume 3 page 240*
 Prague *picture, volume 3 page 240*,
picture, volume 10 page 142
 Roma dancing at a festival *picture, volume 11 page 81*



dabbling duck (waterfowl)
 duck *volume 4 page 81*

dachshund (breed of dog)
 hound breeds *table, volume 4 page 62*

Dacia (historical region in Europe)
 Romania *volume 11 page 85*

Daedalus (Greek mythology)

MAIN ARTICLE *volume 4 page 4*, *picture, volume 4 page 4*

“Dafne” (opera by Peri)
 opera *volume 9 page 142*

da Gama, Vasco (Portuguese navigator):
see in index Gama, Vasco da

dagger (weapon)

bronze *picture, volume 2 page 135*

Daguerre, Louis (French inventor)
 camera *volume 3 page 21*
 photography *volume 10 page 77*

daguerreotype (early recorded image)
 camera *volume 3 page 21*
 photography *volume 10 page 77*

Dahl, Roald (British author)

MAIN ARTICLE *volume 4 page 4*, *picture, volume 4 page 5*

Dahomey (historical French colony in Africa)
 Dahomey kingdom *volume 4 page 6*

Dahomey (historical kingdom in Africa)
 MAIN ARTICLE *volume 4 page 5*

MORE TO EXPLORE

Benin *volume 2 page 60*

Daimler, Gottlieb (German engineer and inventor)
technology and invention *volume 13*
page 27

daisy (plant and flower)
MAIN ARTICLE *volume 4* *page 6*, *picture*,
volume 4 *page 6*

Dakar (capital city of Senegal)
MAIN ARTICLE *volume 4* *page 6*, *picture*,
volume 4 *page 7*
MORE TO EXPLORE
Senegal *volume 12* *page 66*

Dakota (Native American people)
Sioux people *volume 12* *page 92*

Dalai Lama (Tibetan leader)
MAIN ARTICLE *volume 4* *page 7*, *picture*,
volume 4 *page 7*
MORE TO EXPLORE
Tibet *volume 13* *page 62*

Dalí, Salvador (Spanish artist)
painting *volume 10* *page 11*

Dallas (city in Texas, U.S.)
MAIN ARTICLE *volume 4* *page 8*

Dalmatia (region in Croatia)
beach at Dubrovnik *picture*, *volume 3*
page 218

Dalmatian (breed of dog)
non-sporting dogs *table*, *volume 4*
page 62

dam (barrier designed to store or divert water)
MAIN ARTICLE *volume 4* *page 9*
MORE TO EXPLORE
Columbia River *volume 3* *page 160*
Hoover Dam *picture*, *volume 4* *page 9*
Itaipú Dam *picture*, *volume 10* *page 31*
Nile River *volume 9* *page 73*
Yangtze River *volume 15* *page 87*

Damascus (capital city of Syria)
MAIN ARTICLE *volume 4* *page 10*, *picture*,
volume 4 *page 10*
MORE TO EXPLORE
Syria *volume 12* *page 223*

Damavand, Mount (mountain in Iran)
Iran *volume 6* *page 147*

Danaë (Greek mythology)
Perseus *volume 10* *page 60*

dance (art)
MAIN ARTICLE *volume 4* *page 11*

MORE TO EXPLORE

Duncan *volume 4* *page 82*
modern dances
figure skating *picture*, *volume 6*
page 110
Haitian parade dance *picture*, *volume 10* *page 130*
“Split Sides” *picture*, *volume 4* *page 11*
tango *picture*, *volume 4* *page 12*
traditional dances
Cherokee *picture*, *volume 3* *page 88*
East Timorese *picture*, *volume 4*
page 96
Papuan warrior dance *picture*, *volume 10* *page 29*
Portuguese *picture*, *volume 10*
page 134
Roma *picture*, *volume 11* *page 81*
Thai *picture*, *volume 4* *page 13*

dandelion (plant and flower)
MAIN ARTICLE *volume 4* *page 14*, *picture*,
volume 4 *page 14*

Dane (nationality)
Vikings *volume 14* *page 89*

Danube River (river in Europe)
Hungary *picture*, *volume 6* *page 101*
Serbia *picture*, *volume 12* *page 72*

Dao (Chinese philosophical concept)
Daoism *volume 4* *page 15*

“Daodejing” (Chinese literature)
Daoism *volume 4* *page 15*

Daoism (Chinese philosophy and religion)
MAIN ARTICLE *volume 4* *page 15*, *picture*,
volume 4 *page 15*

Darby, Abraham (British ironmaster)
technology and invention *volume 13*
page 26

Dardanelles (strait in Turkey)
MAIN ARTICLE *volume 4* *page 15*
MORE TO EXPLORE
Mediterranean Sea *volume 8* *page 94*

Dar es Salaam (de facto capital city of Tanzania)
MAIN ARTICLE *volume 4* *page 16*
MORE TO EXPLORE
fish market *picture*, *volume 4* *page 16*
Tanzania *volume 13* *page 15*

Darfur (region in Sudan)
Sudan *volume 12* *page 200*

Darién (region in Panama)
Balboa *volume 2* *page 11*

Darius I (king of Persia)
Persia *volume 10* *page 61*

Darius III (king of Persia)
Alexander the Great *volume 1* *page 73*

Darius the Great (king of Persia): *see in index* Darius I

dark chocolate (food)
chocolate *volume 3* *page 108*

darkroom (space used for film processing) *picture*, *volume 10* *page 76*

Darling River (river in New South Wales, Australia)
New South Wales *volume 9* *page 53*

darning needle (insect): *see in index* dragonfly

Darnley, Henry Stewart, Lord (British lord)
Mary, Queen of Scots *volume 8* *page 67*

Darwin (capital city of Northern Territory, Australia)
Northern Territory *volume 9* *page 90*

Darwin, Charles (British naturalist)
MAIN ARTICLE *volume 4* *page 17*, *picture*,
volume 4 *page 17*

MORE TO EXPLORE
evolution *volume 4* *page 171*
Galápagos Islands *volume 5* *page 80*
zoology *volume 15* *page 109*

data (information science)
computer *volume 3* *page 172*
statistics *volume 12* *page 183*

data collection (information science)
statistics *volume 12* *page 183*

data summary (information science)
statistics *volume 12* *page 183*

date (fruit)
MAIN ARTICLE *volume 4* *page 17*, *picture*,
volume 4 *page 18*
MORE TO EXPLORE
date harvest for sale *picture*, *volume 12*
page 224

date palm (tree)
date *volume 4* *page 17*, *picture*, *volume 4*
page 18
Morocco *picture*, *volume 8* *page 184*

David (king of Israel)

- Bethlehem *volume 2 page 64*
Judaism *volume 7 page 38*
- David, Jacques-Louis** (French painter)
“Napoleon in His Study” *picture, volume 9 page 8*
painting *volume 10 page 10*
- “**David**” (sculpture by Michelangelo)
Michelangelo *volume 8 page 115*
- “**David Copperfield**” (work by Dickens)
Dickens *volume 4 page 45*
- Dávila, Pedro Arias** (Spanish soldier and colonial administrator)
Balboa *volume 2 page 11*
Panama City *volume 10 page 24*
- da Vinci, Leonardo** (Italian artist, engineer, and scientist): *see in index*
Leonardo da Vinci
- Davis, Jefferson** (president of the Confederate States of America)
MAIN ARTICLE *volume 4 page 18, picture, volume 4 page 19*
MORE TO EXPLORE
American Civil War *volume 1 page 96*
Confederacy *volume 3 page 177*
- Davis, Miles** (U.S. musician)
jazz *volume 7 page 16*
- Davis, Mount** (mountain in Pennsylvania, U.S.)
Allegheny Mountains *volume 1 page 83*
- Dawes, William** (U.S. patriot)
American Revolution *volume 1 page 100*
- dawn horse** (fossil equine): *see in index*
Eohippus
- Dawson** (city in Yukon, Canada)
Yukon *volume 15 page 98*
Dawson *picture, volume 15 page 98*
- day**
calendar *volume 3 page 9*
time *volume 13 page 67*
- daylily** (plant)
lily *volume 7 page 151*
- D-Day** (European-U.S. history): *see in index*
Normandy Invasion
- deadly nightshade** (plant)
nightshade *volume 9 page 71*
- dead reckoning** (navigation)
navigation *volume 9 page 24*
- Dead Sea** (salt lake in the Middle East)
MAIN ARTICLE *volume 4 page 19*
MORE TO EXPLORE
Israel *volume 6 page 168*
Jordan River *volume 7 page 36*
salt deposits *picture, volume 4 page 20*
- Dead Sea Scrolls** (ancient manuscripts)
MAIN ARTICLE *volume 4 page 20, picture, volume 4 page 20*
- deafness** (medical disorder)
MAIN ARTICLE *volume 4 page 21*
MORE TO EXPLORE
Bell *volume 2 page 58*
teacher using sign language *picture, volume 12 page 87*
- death**
MAIN ARTICLE *volume 4 page 22*
- death camp** (Nazi concentration camp)
Holocaust *volume 6 page 72*
- death penalty** (law): *see in index* capital punishment
- Death Valley** (region in California, U.S.)
MAIN ARTICLE *volume 4 page 22, picture, volume 4 page 23*
MORE TO EXPLORE
United States *volume 14 page 24*
- Death Valley National Park** (national park in California and Nevada, U.S.)
sand dunes *picture, volume 12 page 27*
- deathwatch beetle** (insect)
types of beetles *picture, volume 2 page 49*
- decathlon** (athletic competition)
Thorpe *volume 13 page 61*
track and field *volume 13 page 87*
- deciduous forest** (life zone)
biome *volume 2 page 74*
tropics *volume 13 page 99*
- deciduous tree**
forest *volume 5 page 53*
leaf *volume 7 page 118*
tree *volume 13 page 94*
- decimal fraction** (mathematics)
numbers and number systems *volume 9 page 106*
- decimal number system** (mathematics):
see in index base-ten number system
- deck** (watercraft part)
boat *volume 2 page 97*
ship *volume 12 page 82*
- Declaration of Independence** (U.S. history)
MAIN ARTICLE *volume 4 page 23, picture, volume 4 page 24*
MORE TO EXPLORE
Adams, John *volume 1 page 23*
American Revolution *volume 1 page 101*
Delaware *volume 4 page 31*
George III *volume 5 page 100*
human rights *volume 6 page 97*
Independence Day *volume 6 page 122*
Jefferson *volume 7 page 17*
Liberty Bell *volume 7 page 141*
Pennsylvania *volume 10 page 56*
United States *volume 14 page 28*
- Declaration of the Rights of Man and of the Citizen** (document of the French Revolution, 1789): *see in index* Rights of Man and of the Citizen, Declaration of the
- decomposer** (biology)
ecosystem *volume 4 page 101*
food chain *volume 5 page 45*
- decorative arts**
MAIN ARTICLE *volume 4 page 24, picture, volume 4 page 25, picture, volume 4 page 25, picture, volume 4 page 26*
MORE TO EXPLORE
ironwork railing *picture, volume 6 page 157*
lace: *see in index* lace
pottery: *see in index* pottery
rugs: *see in index* rug
- deejay** (entertainment)
hip-hop *volume 6 page 58*
- Deep Junior** (computer)
match against Kasparov *picture, volume 1 page 195*
- Deep South** (region in the United States)
for the states in this region: *see in index*
Alabama; Arkansas; Florida; Georgia; Louisiana; Mississippi; South Carolina
- deer** (mammal)
MAIN ARTICLE *volume 4 page 26*
MORE TO EXPLORE
doe and fawn *picture, volume 6 page 4*
white-tailed deer *picture, volume 4 page 26*
- Deere, John** (U.S. inventor and manufacturer)
MAIN ARTICLE *volume 4 page 27*

Deere & Company (U.S. company)Deere *volume 4 page 27*steel plow *picture, volume 4 page 27***defendant** (law)law *volume 7 page 117***defender** (soccer position)soccer *volume 12 page 117***Defense, Department of** (U.S. government agency)United States government executive departments *table, volume 14 page 35***defense** (sports)basketball *volume 2 page 34*football *volume 5 page 49***defensive behavior** (biology)reptile *volume 11 page 52***Defoe, Daniel** (British author)literature for children *volume 7 page 163***deforestation**global warming *volume 5 page 121*rain forest *volume 11 page 24***Degas, Edgar** (French artist)painting *volume 10 page 10***De Gaulle, Charles** (president of France)MAIN ARTICLE *volume 4 page 28, picture, volume 4 page 28*

MORE TO EXPLORE

France *volume 5 page 60*World War II *volume 15 page 66***degree** (of an angle)geometry *volume 5 page 98***dehydration** (physiology)cholera *volume 3 page 110***Deimos** (satellite of Mars)Mars *volume 8 page 58***Deinonychus** (dinosaur)dinosaurs in scale *picture, volume 4 page 53***Dekanawidah** (Iroquois leader)Hiawatha *volume 6 page 49***de Klerk, F. W.** (president of South Africa)Mandela *volume 8 page 41*South Africa *volume 12 page 139***de Kooning, Willem** (U.S. artist)painting *volume 10 page 11***De La Beckwith, Byron** (U.S. mur-derer): *see in index* La Beckwith, Byron
de**Delaware** (Native American people)MAIN ARTICLE *volume 4 page 29*

MORE TO EXPLORE

Algonquian *volume 1 page 80*Delaware *volume 4 page 31*Mahican *volume 8 page 153*New Jersey *volume 9 page 50***Delaware** (state in the U.S.)MAIN ARTICLE *volume 4 page 30*

MORE TO EXPLORE

geography

Legislative Hall, Dover *picture, volume 4 page 68*Rehoboth Beach *picture, volume 4 page 31***delayed toxic response** (medical disorder)poison *volume 10 page 106***Delhi** (national capital territory of India)MAIN ARTICLE *volume 4 page 32, picture, volume 4 page 32***Delphi** (town in ancient Greece)MAIN ARTICLE *volume 4 page 32, picture, volume 4 page 33*

MORE TO EXPLORE

Tholos temple *picture, volume 5 page 154***delta** (river formation)MAIN ARTICLE *volume 4 page 33*

MORE TO EXPLORE

marsh *volume 8 page 60, picture, volume 8 page 60*Mekong delta *picture, volume 8 page 96*Nile River delta *picture, volume 4 page 33*river *volume 11 page 68***Demeter** (Greek goddess)MAIN ARTICLE *volume 4 page 34***de Mille, Agnes** (U.S. choreographer and dancer)dance *volume 4 page 14***democracy** (form of government)MAIN ARTICLE *volume 4 page 35*

MORE TO EXPLORE

ancient Greece *volume 5 page 155*government *volume 5 page 131*Iceland *volume 6 page 108*republic *volume 11 page 53*voting *volume 14 page 105*voters in Sierra Leone *picture, volume 4 page 35***Democratic Party** (U.S. political party)Buchanan *volume 2 page 140*Jackson *volume 7 page 6*Van Buren *volume 14 page 54***Democratic Progressive Party** (political party in Taiwan)Taiwan *volume 13 page 9***Democratic Republic of the Congo**(country in Africa): *see in index* Congo,
Democratic Republic of the**“Demoiselles d’Avignon, Les”** (painting by Picasso)Picasso *volume 10 page 80***demolition bomb** (military technology)bomb *volume 2 page 104***demonstrations and protests**Arkansas students *picture, volume 5 page 132*Basque independence *picture, volume 2 page 36*capital punishment *picture, volume 3 page 35*censorship *picture, volume 3 page 69*French Revolution *picture, volume 5 page 69*

U.S. civil rights movement

March on Washington *picture, volume 3 page 130*Oklahoma restaurant *picture, volume 3 page 130***Denali** (mountain in Alaska, U.S.): *see in index* McKinley, Mount**Denali National Park and Preserve**

(national park in Alaska, U.S.)

Mount McKinley *volume 8 page 86, picture, volume 8 page 86***Dene** (Native American people)Athapaskan *volume 1 page 217*Northwest Territories *volume 9 page 95***Denishawn** (U.S. dance school)Graham *volume 5 page 134***Denmark** (country in Europe)MAIN ARTICLE *volume 4 page 36, picture, volume 4 page 36*

MORE TO EXPLORE

geography

- Copenhagen *picture, volume 3 page 196, picture, volume 4 page 37*
 Greenland *volume 5 page 157, picture, volume 5 page 158*
 history
 Alfred the Great *volume 1 page 75*
 Iceland *volume 6 page 108*
 Norway *volume 9 page 98*
- denominator** (mathematics)
 numbers and number systems *volume 9 page 106*
- dental hygienist**
 dentistry *volume 4 page 38*
- dentin** (tooth)
 teeth *volume 13 page 31*
- dentistry**
 MAIN ARTICLE *volume 4 page 38, picture, volume 4 page 38*
 MORE TO EXPLORE
 teeth *volume 13 page 31*
 X-rays *volume 15 page 82*
- denture** (dentistry)
 dentistry *volume 4 page 38*
- Denver** (state capital of Colorado, U.S.)
 MAIN ARTICLE *volume 4 page 39, picture, volume 4 page 39*
 MORE TO EXPLORE
 Colorado *volume 3 page 157*
- deoxyribonucleic acid** (genetic material):
see in index DNA
- Department of Health and Human Services** (U.S. government agency): *see in index* Health and Human Services, U.S. Department of
- depression** (psychology)
 mental illness *volume 8 page 100*
- depth** (measured distance): *see in index* length
- dermis** (anatomy)
 skin *volume 12 page 101, picture, volume 12 page 101*
- derrick, oil**: *see in index* oil rig
- desert** (life zone)
 MAIN ARTICLE *volume 4 page 39, picture, volume 4 page 40*
 MORE TO EXPLORE
 biome *volume 2 page 75*
 cactus *volume 3 page 5*
 irrigation *picture, volume 6 page 161*
 mirage *picture, volume 8 page 138*
 Nevada *picture, volume 9 page 41*
 tropics *volume 13 page 99*
- desert lynx** (mammal): *see in index* caracal
- Desert Saber, Operation** (Middle East history)
 Persian Gulf War *volume 10 page 62*
- Desert Shield, Operation** (Middle East history)
 Persian Gulf War *volume 10 page 62*
- Desert Storm, Operation** (Middle East history)
 Persian Gulf War *volume 10 page 62*
- desert tortoise** (reptile) *picture, volume 13 page 117*
- design** (arts and technology)
 architecture *volume 1 page 167*
- desman** (mammal)
 mole *volume 8 page 155*
- Des Moines** (state capital of Iowa, U.S.)
 MAIN ARTICLE *volume 4 page 40*
 MORE TO EXPLORE
 State Capitol *picture, volume 4 page 41, picture, volume 6 page 145*
- Des Moines, Fort** (fort in Des Moines, Iowa, U.S.)
 Des Moines *volume 4 page 41*
- de Soto, Hernando** (Spanish explorer)
 MAIN ARTICLE *volume 4 page 41, picture, volume 4 page 41*
 MORE TO EXPLORE
 Arkansas *volume 1 page 181*
 Chickasaw *volume 3 page 94*
 Georgia *volume 5 page 102*
 Mississippi River *volume 8 page 145*
 Tallahassee *volume 13 page 12*
- Dessalines, Jean-Jacques** (Haitian leader)
 Toussaint Louverture *volume 13 page 83*
- destroyer** (warship)
 navy *volume 9 page 25*
- detective** (criminal investigator)
 police *volume 10 page 112*
- deuce** (tennis scoring)
 tennis *volume 13 page 46*
- “Deutschlandlied”** (German national anthem)
 national anthem *volume 9 page 13*
- developing nation** (economics)
 banking *picture, volume 2 page 25*
- Devil’s Island** (island of French Guiana, Atlantic Ocean)
 French Guiana *picture, volume 5 page 67*
- Devils Postpile National Monument** (national monument in California, U.S.) *picture, volume 11 page 75*
- Devon House** (mansion in Kingston, Jamaica) *picture, volume 7 page 68*
- dew** (meteorology)
 MAIN ARTICLE *volume 4 page 42, picture, volume 4 page 42*
 MORE TO EXPLORE
 evaporation and condensation *volume 4 page 166*
- Dewey, George** (U.S. navy commander)
 Spanish-American War *volume 12 page 157*
- Dewey Decimal System** (library science)
 library *volume 7 page 143*
- dewfall** (meteorology)
 dew *volume 4 page 42*
- “Dewitt Clinton”** (steam locomotive)
picture, volume 13 page 27
- dew point** (meteorology)
 dew *volume 4 page 42*
- Dhaka** (capital city of Bangladesh)
 MAIN ARTICLE *volume 4 page 42, picture, volume 4 page 43*
 MORE TO EXPLORE
 Bangladesh *volume 2 page 21*
- dharma** (religious concept)
 Buddhism *volume 2 page 144*
- diabetes** (disease)
 MAIN ARTICLE *volume 4 page 43*
 MORE TO EXPLORE
 disease, human *volume 4 page 57*
 endocrine system *volume 4 page 136*
 insulin injection *picture, volume 4 page 43*
 pancreas *volume 10 page 25*
- diabetes insipidus** (disease)
 diabetes *volume 4 page 43*
- diabetes mellitus** (disease)
 blindness *volume 2 page 90*

- diabetes *volume 4 page 43*
- Diaghilev, Sergey** (Russian ballet expert)
ballet *volume 2 page 14*
dance *volume 4 page 13*
- dialect** (language)
language *volume 7 page 106*
- dial plate** (time keeping)
sundial *volume 12 page 204, picture, volume 12 page 204*
- dialysis** (therapeutics)
dialysis machine *picture, volume 13 page 29*
urinary system *volume 14 page 41*
- diamond** (gem)
jewelry and gems *volume 7 page 24*
crown of Queen Victoria *picture, volume 7 page 24*
Namibia *volume 9 page 7*
sorting diamonds *picture, volume 5 page 79*
- Diana** (Roman goddess)
Artemis *volume 1 page 190*
- diaphragm** (anatomy)
lung *volume 7 page 184, picture, volume 7 page 184*
respiratory system *volume 11 page 55, picture, volume 11 page 56*
- diarrhea** (disease)
cholera *volume 3 page 110*
- “Diary of Anne Frank, The”** (diary by Frank)
Frank *volume 5 page 61*
- Dias, Bartolomeu** (Portuguese explorer)
MAIN ARTICLE *volume 4 page 44, picture, volume 4 page 44*
MORE TO EXPLORE
Gama *volume 5 page 83*
Portugal *volume 10 page 134*
- diatom** (single-celled organism)
ocean food chain *picture, volume 5 page 45*
- Díaz, Porfirio** (president of Mexico)
Mexico *volume 8 page 112*
Zapata *volume 15 page 102*
- dice** (game pieces)
Indus Valley Civilization *picture, volume 6 page 135*
- Dickens, Charles** (British author)
- MAIN ARTICLE *volume 4 page 45, picture, volume 4 page 45*
- dictator** (ruler): *see in index* dictatorship
- dictatorship** (form of government)
MAIN ARTICLE *volume 4 page 46*
MORE TO EXPLORE
government *volume 5 page 133*
- Diddy** (U.S. rapper and music producer):
see in index Combs, Sean
- Dido** (founder and queen of Carthage)
Carthage *volume 3 page 48*
- Diesel, Rudolf** (German engineer)
internal-combustion engine *volume 6 page 141*
- diesel engine**
internal-combustion engine *volume 6 page 141*
railroad *volume 11 page 20*
submarine *volume 12 page 198*
- Diet** (Japanese government)
Meiji *volume 8 page 95*
- diet** (nutrition)
iron *volume 6 page 158*
- dig** (archaeology): *see in index* excavation
- digest** (publication)
magazine *volume 8 page 14*
- digestion** (biology)
intestine *volume 6 page 142*
- digestive system** (anatomy and physiology)
MAIN ARTICLE *volume 4 page 46*
MORE TO EXPLORE
frog *picture, volume 4 page 48*
grasshopper *picture, volume 4 page 48*
humans *picture, volume 4 page 47*
mouth *volume 8 page 196, picture, volume 13 page 80*
muscle *volume 8 page 209*
pancreas *volume 10 page 24, picture, volume 10 page 24*
urinary system *volume 14 page 40*
parasite *volume 10 page 33*
spider *volume 12 page 165*
- digit** (anatomy)
hand *volume 6 page 12*
- digit** (number systems)
numbers and number systems *volume 9 page 105*
- digital audio player**
MP3 player *picture, volume 12 page 136*
sound recording *volume 12 page 136*
- digital camera** (photography) *picture, volume 3 page 21*
camera *volume 3 page 21, picture, volume 3 page 20*
photography *volume 10 page 77*
- digital display** (computer technology)
clock *volume 3 page 141*
- digital printing**: *see in index* electronic printing
- digital recording** (filmmaking)
movie *volume 8 page 199*
- digital signal** (electronics)
electronics *volume 4 page 122*
television *volume 13 page 40*
- digital TV**
television *volume 13 page 40*
- digital videodisc** (digital recording media)
compact disc *volume 3 page 170*
video recording *volume 14 page 81*
- digital video recorder** (electronic device)
video recording *volume 14 page 81*
- dike** (civil engineering)
MAIN ARTICLE *volume 7 page 135*
- Dili** (capital city of East Timor)
MAIN ARTICLE *volume 4 page 49*
MORE TO EXPLORE
East Timor *volume 4 page 96*
- Dilmun** (ancient trading center on the Persian Gulf)
Bahrain *volume 2 page 9*
- dimension stone** (mining)
quarrying *volume 11 page 7*
- Dinan** (town in western France) *picture, volume 5 page 58*
- Diné** (Native American people): *see in index* Navajo
- dingo** (wild dog)
dog *volume 4 page 61*
- Dinornis** (extinct bird): *see in index* moa
- dinosaur** (extinct reptile)
MAIN ARTICLE *volume 4 page 49*
MORE TO EXPLORE
extinct animals *volume 1 page 127*

images

- Brachiosaurus *picture, volume 2 page 119*
 dinosaur tracks *picture, volume 10 page 17*
 Eoraptor *picture, volume 4 page 145*
 Euoplocephalus *picture, volume 4 page 158*
 Iguanodon *picture, volume 6 page 114*
 mouth structure *picture, volume 4 page 51*
 Ornithischia and Saurischia *picture, volume 4 page 50*
 Oviraptor *picture, volume 9 page 158*
 relative sizes *picture, volume 4 page 53*
 sitting on eggs *picture, volume 4 page 52*
 Stegosaurus *picture, volume 12 page 185*
 Triceratops *picture, volume 13 page 96*
 Tyrannosaurus rex *picture, volume 13 page 125*
 Velociraptor *picture, volume 14 page 62*
 prehistoric life *volume 10 page 146*

Dione (Greek goddess)
 Aphrodite *volume 1 page 148*

Dionysus (Greek god)
 Midas *volume 8 page 121*

direct democracy (form of government)
 democracy *volume 4 page 35*
 government *volume 5 page 131*

directing (filmmaking and theater)
 editing film *picture, volume 8 page 198*
 movie *volume 8 page 198*
 theater *volume 13 page 57*

Directory (French history)
 French Revolution *volume 5 page 70*

dirigible (aircraft): *see in index* airship

Dirty War (history of Argentina)
 Argentina *volume 1 page 176*

disability (medical disorder)
 MAIN ARTICLE *volume 4 page 53*
 MORE TO EXPLORE

- Down syndrome *volume 4 page 69*
 wheelchair *picture, volume 4 page 54*

“Discovery” (space shuttle) *picture, volume 12 page 151*
 launch of July 2006 *picture, volume 5 page 36*
 space exploration *volume 12 page 152*

discovery and exploration of the Americas: *see in index* Americas

discrimination (social practice)
 MAIN ARTICLE *volume 4 page 54*

MORE TO EXPLORE

- apartheid *volume 1 page 144*
 Arthur *volume 1 page 192*
 Asian Americans *volume 1 page 207*
 beach sign *picture, volume 4 page 54*

discus throw (athletics)
 track and field *volume 13 page 86, picture, volume 13 page 85*

disease (animal)
 MAIN ARTICLE *volume 4 page 55*

MORE TO EXPLORE

- flea *volume 5 page 39*

disease (human)
 MAIN ARTICLE *volume 4 page 56*

MORE TO EXPLORE

- cardiovascular system *volume 3 page 40*
 death *volume 4 page 22*
 endocrine system *volume 4 page 136*
 flea *volume 5 page 39*

For more about human diseases and conditions, look for these articles:

Acne	Lyme Disease
AIDS	Malaria
Allergy	Measles
Alzheimer's Disease	Meningitis
Arthritis	Mental Illness
Asthma	Mononucleosis
Blindness	Mumps
Cancer	Parkinson's Disease
Cerebral Palsy	Pneumonia
Chicken Pox	Polio
Cholera	Reye's Syndrome
Cold, Common	Rubella
Cough	Scarlet Fever
Deafness	Smallpox
Diabetes	Strep Throat
Down Syndrome	Tonsillitis
Encephalitis	Tuberculosis
Epilepsy	West Nile Virus
Influenza	

disk flower (botany)
 sunflower *volume 12 page 204*

Disney, Walt (U.S. film producer)
 MAIN ARTICLE *volume 4 page 57, picture, volume 4 page 57*

MORE TO EXPLORE

- animation *volume 1 page 131*

Disneyland (amusement park in Anaheim, California, U.S.)
 Disney *volume 4 page 58*

Disney World (amusement park in Florida, U.S.): *see in index* Walt Disney World

display (information recording)
 radar *volume 11 page 15*

Disraeli, Benjamin (prime minister of the United Kingdom)
 Queen Victoria *volume 14 page 77*

dissection (biology)
 anatomy *volume 1 page 115*

dissenting opinion (law)
 United States government *volume 14 page 36*

district court (law and government)
 United States government *volume 14 page 35*

diver (bird): *see in index* loon

Divine Liturgy (Eastern Orthodoxy)
 Eastern Orthodox Churches *volume 4 page 94*

Divine Right of Kings (political doctrine)
 monarchy *volume 8 page 159*

diving (animal behavior)
 loon *volume 7 page 176*

diving duck (waterfowl)
 duck *volume 4 page 81*

division of powers (political science and government): *see in index* powers, separation of

Division of the North (Mexican military force)
 Villa *volume 14 page 91*

Diwali (Hindu festival)
 MAIN ARTICLE *volume 4 page 58*

MORE TO EXPLORE

- lamp lighting *picture, volume 4 page 58*

Djibouti (country in Africa)
 MAIN ARTICLE *volume 4 page 59*

Djibouti (capital city of Djibouti)
 MAIN ARTICLE *volume 4 page 60*

MORE TO EXPLORE

Djibouti *volume 4 page 59*

DNA (genetic material)

MAIN ARTICLE *volume 4 page 60*

MORE TO EXPLORE

chromosome *volume 3 page 115*

evolution *volume 4 page 170*

genetics *volume 5 page 93*

mutation *volume 8 page 220*

structure *picture, volume 4 page 60*

Doby, Larry (U.S. baseball player)

Campanella, Doby, Newcombe, and

Robinson *picture, volume 2 page 32*

doctor (medical worker)

common abbreviations *table, volume 1 page 8*

medicine *volume 8 page 92*

pediatrician *picture, volume 8 page 92*

Dodgers (U.S. baseball team)

airship flies over Dodger Stadium *picture, volume 1 page 58*

Robinson *volume 11 page 73*

Dodger Stadium (stadium in Los Angeles, California, U.S.)

airship flies over Dodger Stadium *picture, volume 1 page 58*

Dodgson, Charles Lutwidge (British author): *see in index* Carroll, Lewis

dodo (bird) *picture, volume 1 page 126*

flightless birds *volume 2 page 79*

Mauritius *volume 8 page 80*

Dodoma (capital city of Tanzania)

Dar es Salaam *volume 4 page 16*

dog (domesticated mammal)

MAIN ARTICLE *volume 4 page 61, picture, volume 4 page 61*

MORE TO EXPLORE

aging *volume 1 page 48*

American dog tick *picture, volume 13 page 63*

dog breeds *table, volume 4 page 62*

dogsled *picture, volume 5 page 158, picture, volume 6 page 113*

foot *picture, volume 5 page 47*

guide dog *picture, volume 3 page 77*

pet *volume 10 page 66, picture, volume 10 page 66*

Doges' Palace (palace in Venice, Italy)

Venice *volume 14 page 65*

dogfight (aerial warfare)

World War I *picture, volume 15 page 64*

dogsled (transportation)

Greenland *picture, volume 5 page 158*

Iditarod *picture, volume 6 page 113*

dogsled racing (sport): *see in index* Iditarod

Doha (capital city of Qatar)

MAIN ARTICLE *volume 4 page 63, picture, volume 4 page 64*

MORE TO EXPLORE

Qatar *volume 11 page 4*

dolphin (mammal)

MAIN ARTICLE *volume 4 page 64, picture, volume 8 page 35*

MORE TO EXPLORE

front limb *picture, volume 1 page 182*

oceanography *picture, volume 9*

page 119

porpoise *volume 10 page 129*

dome (architectural feature)

architecture *volume 1 page 169*

Eastern Orthodox church *picture, volume 4 page 94*

Dome of the Rock (monument in Jerusalem)

Jerusalem *volume 7 page 21*

Western Wall and the Dome of the Rock *picture, volume 7 page 21*

domestication of animals and plants

agriculture *volume 1 page 48*

mammals *volume 8 page 37*

dog *volume 4 page 61*

Stone Age *volume 12 page 189*

dominance (biology)

genetics *volume 5 page 94*

Dominica (island country in the West Indies)

MAIN ARTICLE *volume 4 page 65*

MORE TO EXPLORE

Carib basket weaver *picture, volume 3 page 40*

cathedral in Roseau *picture, volume 11 page 98*

Dominican Republic (country in the West Indies)

MAIN ARTICLE *volume 4 page 66*

MORE TO EXPLORE

Santo Domingo cathedral *picture, volume 12 page 34*

Dominion Day (holiday): *see in index* Canada Day

Dom Pedro IV Square (square in Lisbon, Portugal) *picture, volume 7 page 159*

Donatello (Italian sculptor)

sculpture *volume 12 page 56*

donjon (military architecture): *see in index* keep

donkey (mammal)

MAIN ARTICLE *volume 4 page 67, picture, volume 4 page 67*

“Don Quixote” (novel by Cervantes)

literature *volume 7 page 162*

Dorian (people)

ancient Greece *volume 5 page 154*

dormancy (biology)

seed *volume 12 page 62*

dormouse (rodent genus)

hibernation *picture, volume 6 page 50*

rodent *volume 11 page 80*

Dorr Rebellion (U.S. history)

Tyler *volume 13 page 124*

Dorsey, Thomas A. (U.S. pianist and songwriter)

gospel music *volume 5 page 130*

double agent (espionage)

spy *volume 12 page 170*

double bass (musical instrument)

stringed instruments *picture, volume 8 page 216*

Doubleday, Abner (U.S. Army officer)

baseball *volume 2 page 32*

double-decker bus

London *picture, volume 7 page 175*

doubles (tennis)

tennis *volume 13 page 45, picture, volume 13 page 46*

Douglas, Stephen A. (U.S. senator)

Lincoln-Douglas debates *volume 7 page 156, picture, volume 7 page 156*

Douglas fir (tree)

conifers *picture, volume 3 page 183*

fir *volume 5 page 24*

Douglass, Frederick (U.S. human rights leader)

MAIN ARTICLE *volume 4 page 67, picture, volume 4 page 67*

dove (bird)MAIN ARTICLE *volume 10 page 83*

MORE TO EXPLORE

mourning dove *picture, volume 10 page 84***Dover** (state capital of Delaware, U.S.)MAIN ARTICLE *volume 4 page 68, picture, volume 4 page 68*

MORE TO EXPLORE

Delaware *volume 4 page 30***Dover, Strait of** (international waterway in Europe)English Channel *volume 4 page 141***down** (fluffy feather)feather *volume 5 page 9*swan *volume 12 page 210***downhill racing** (skiing)Alpine skiing courses *picture, volume 12 page 98*skiing *volume 12 page 99***Down's syndrome** (medical disorder)MAIN ARTICLE *volume 4 page 69***Draco** (constellation)constellation *volume 3 page 188***draft** (military service)army *volume 1 page 190***drag** (physics)airplane *volume 1 page 56***dragon** (mythical beast)legendary animals *volume 1 page 128*sculpture *picture, volume 1 page 128***dragonfly** (insect)MAIN ARTICLE *volume 4 page 69, picture, volume 4 page 70***drainage basin** (land drained by a river):*see in index* basin**Drake, Edwin Laurentine** (U.S. petroleum pioneer)technology and invention *volume 13 page 27***Drake, Francis** (English explorer)MAIN ARTICLE *volume 4 page 70, picture, volume 4 page 70*

MORE TO EXPLORE

Oregon *volume 9 page 148*pirate *volume 10 page 89***Drakensberg** (mountain range in South Africa)South Africa *volume 12 page 137***drama** (literature and theater)MAIN ARTICLE *volume 4 page 71*

MORE TO EXPLORE

"A Midsummer Night's Dream" *picture, volume 4 page 73*"Romeo and Juliet" *picture, volume 7 page 161*"The Piano Lesson" *picture, volume 4 page 74***dramatic ballet** (dance)ballet *volume 2 page 14***dramatist** (literature and theater): *see in**index* playwright**drawbridge** (construction)castle *volume 3 page 52, picture, volume 3 page 53***drawing** (art)MAIN ARTICLE *volume 4 page 75, picture, volume 4 page 75***Drebbel, Cornelis** (Dutch inventor)submarine *volume 12 page 197***Dred Scott decision** (U.S. Supreme

Court ruling, 1857)

MAIN ARTICLE *volume 4 page 76*

MORE TO EXPLORE

portrait of Scott *picture, volume 4 page 77*slavery *volume 12 page 107***drill** (primate) *picture, volume 8 page 167***drip irrigation** (agriculture)irrigation *volume 6 page 161***drive shaft** (construction)automobile *volume 1 page 236***dromedary** (camel) *picture, volume 3**page 19*camel *volume 3 page 19***drone** (insect caste)bee *volume 2 page 46***dropped goal** (sports)rugby *volume 11 page 103***drought** (shortage of rain)MAIN ARTICLE *volume 4 page 77, picture, volume 4 page 78***drug** (chemical agent)MAIN ARTICLE *volume 4 page 78***drug abuse**drug *volume 4 page 79***druggist** (physiology): *see in index* pharmacy**Druid** (ancient Celtic order)Celts *volume 3 page 68***drum** (musical instrument)musical instruments *volume 8 page 215***drupe** (botany)nut *volume 9 page 112***dry fruit** (botany)fruit *volume 5 page 72***DTV** (television): *see in index* digital TV**Duarte Peak** (mountain in Dominican Republic)Dominican Republic *volume 4 page 66***Dubcek, Alexander** (Slovak statesman)Czechoslovakia *volume 3 page 238***Dublin** (capital city of Ireland)MAIN ARTICLE *volume 4 page 79*

MORE TO EXPLORE

Cork Hill with Dublin Castle *picture, volume 4 page 80*Ireland *volume 6 page 154***Dublin, University of** (university in Dublin, Ireland)Dublin *volume 4 page 79***Dublin Castle** (castle in Dublin, Ireland)Cork Hill with Dublin Castle *picture, volume 4 page 80***Du Bois, W. E. B.** (U.S. sociologist and reformer)MAIN ARTICLE *volume 4 page 80, picture, volume 4 page 80*

MORE TO EXPLORE

African Americans *volume 1 page 43*civil rights movement *volume 3 page 129*leaders with Du Bois *picture, volume 3 page 129*Washington *volume 15 page 17***Dubrovnik** (city in Croatia)beach *picture, volume 3 page 218*harbor *picture, volume 6 page 17***duck** (bird)MAIN ARTICLE *volume 4 page 81*

MORE TO EXPLORE

adaptation *picture, volume 1 page 27*goose *volume 5 page 127*mandarin duck *picture, volume 4 page 81*

duckbill (mammal): *see in index* platypus

dugout (baseball)
baseball field *picture, volume 2 page 31*

Duluth (city in Minnesota, U.S.)
Saint Lawrence River and Seaway *volume 12 page 13*

Duma (Russian government assembly)
Nicholas II *volume 9 page 65*
Russian Revolution *volume 11 page 108*

Dunant, Henri (Swiss humanitarian)
Red Cross and Red Crescent *volume 11 page 36*

Duncan, Isadora (U.S. dancer)
MAIN ARTICLE *volume 4 page 82, picture, volume 4 page 82*
MORE TO EXPLORE
dance *volume 4 page 13*

dune: *see in index* sand dune

DuPont Company (U.S. company)
Delaware *volume 4 page 30*

Duquesne, Fort (historic fort in Pittsburgh, Pennsylvania, U.S.)
French and Indian War *volume 5 page 66*

Durbar Square (square in Kathmandu, Nepal) *picture, volume 7 page 50*

Duryea, Charles E. (U.S. inventor)
automobile *volume 1 page 237*

Duryea, J. Frank (U.S. inventor)
automobile *volume 1 page 237*

Du Sable, Jean-Baptist-Point (African American pioneer)
MAIN ARTICLE *volume 4 page 83, picture, volume 4 page 83*
MORE TO EXPLORE
Chicago *volume 3 page 93*
Illinois *volume 6 page 118*

Dushanbe (capital city of Tajikistan)
MAIN ARTICLE *volume 4 page 83*
MORE TO EXPLORE
monument in Dushanbe *picture, volume 4 page 83*
Tajikistan *volume 13 page 10*

Dust Bowl (historic region in the U.S.)
MAIN ARTICLE *volume 4 page 84, picture, volume 4 page 84*
MORE TO EXPLORE
Kansas *volume 7 page 48*
Oklahoma *volume 9 page 130*

dust storm (weather)
storm *volume 12 page 192*

Dutch elm disease (fungus)
elm *volume 4 page 128*

Dutch Republic (historical state in Europe): *see in index* Netherlands, United Provinces of the

DVD (digital recording media): *see in index* digital videodisc

DVR (electronic device): *see in index* digital video recorder

dwarf crocodile (reptile)
crocodile *volume 3 page 220*

dwarf lantern shark (shark species)
shark *volume 12 page 76*

dwarf planet (astronomy)
Pluto *picture, volume 10 page 101*
solar system *volume 12 page 128*

dwelling: *see in index* castle; house; igloo; longhouse; palace; tepee



E (galaxy): *see in index* elliptical galaxy

eagle (bird)
MAIN ARTICLE *volume 4 page 86*
MORE TO EXPLORE
bald eagle *picture, volume 4 page 86*

ear (anatomy)
MAIN ARTICLE *volume 4 page 86, picture, volume 4 page 87, picture, volume 4 page 87*
MORE TO EXPLORE
deafness *volume 4 page 21*

ear canal (anatomy)
ear *volume 4 page 87, picture, volume 4 page 87*

eardrum (anatomy)
ear *volume 4 page 87, picture, volume 4 page 87*

eared seal (mammal)
sea lion *picture, volume 12 page 59*
seal *volume 12 page 59*

Earhart, Amelia (U.S. aviator)
MAIN ARTICLE *volume 4 page 88, picture, volume 4 page 88*

earless seal (mammal)
seal *volume 12 page 59, picture, volume 12 page 59*

Early Christian art
sculpture *volume 12 page 56*

Early Cretaceous Epoch (geochronology)
dinosaurs *picture, volume 4 page 53*

Early Stone Age (anthropology): *see in index* Paleolithic Period

Earth (planet)
MAIN ARTICLE *volume 4 page 89, picture, volume 4 page 90*
MORE TO EXPLORE

astronomy
asteroid *volume 1 page 213*
aurora *volume 1 page 227*
eclipse *volume 4 page 97, picture, volume 4 page 98*
Milky Way *picture, volume 8 page 129*
Moon: *see in index* Moon
Neptune *picture, volume 9 page 33*
planets *volume 10 page 92, picture, volume 10 page 93*
solar system *volume 12 page 127, picture, volume 12 page 127*
Sun *volume 12 page 202*

attraction with Moon *picture, volume 5 page 144*

climate *volume 3 page 137*

equator *volume 4 page 147, picture, volume 4 page 147*

geology and geography *volume 5 page 97*

earth's layers *picture, volume 4 page 89*
plate tectonics *volume 10 page 98*

greenhouse effect *picture, volume 5 page 157*

ice age *volume 6 page 106*

Newton *volume 9 page 56*

paleontology *volume 10 page 17*
season *volume 12 page 61, picture, volume 12 page 61*

tides *volume 13 page 64, picture, volume 13 page 64*

Earth Day (celebration)
MAIN ARTICLE *volume 4 page 91, picture, volume 4 page 91*

earthenware (ceramics)
pottery *volume 10 page 139*

earth lodge (housing)
Mandan *volume 8 page 40*
Omaha Indians *volume 9 page 135*

earthquake (geological event)
MAIN ARTICLE *volume 4 page 91*
MORE TO EXPLORE
ground movement *picture, volume 4 page 92*
landslide *volume 7 page 104*
places
Guatemala City *volume 5 page 168*
Indonesia *volume 6 page 131*
Japan *picture, volume 4 page 92*
Lisbon *volume 7 page 159*
Managua *volume 8 page 38*
Pakistan *picture, volume 9 page 84*
Skopje *volume 12 page 102*
radiation *volume 11 page 17*
tsunami *volume 13 page 103, picture, volume 13 page 104*
volcano *volume 14 page 101*

Earth sciences: *see in index* geology; meteorology; oceanography; physical geography

earthworm *picture, volume 15 page 71*
animal migration *volume 8 page 125*

esal painting (art)
painting *volume 10 page 9*

East Asia (region of Asia)
Asia *volume 1 page 200*

East Beirut (section in Beirut, Lebanon)
Beirut *volume 2 page 51*

Easter (holiday)
MAIN ARTICLE *volume 4 page 93, picture, volume 4 page 93*

Easter Bunny
Easter traditions *volume 4 page 93*

Easter egg
Easter *volume 4 page 93*

eastern box turtle (reptile) *picture, volume 11 page 53*

eastern chipmunk (mammal) *picture, volume 3 page 106*
chipmunk *volume 3 page 106*

eastern diamondback rattlesnake (reptile)

various snakes *picture, volume 12 page 113*

Eastern Europe (region in Europe)
Europe *volume 4 page 160*

Eastern Front (World War I history)
World War I *volume 15 page 63*

Eastern Hemisphere (geography)
hemisphere *volume 6 page 37*

eastern king snake (reptile)
various snakes *picture, volume 12 page 113*

eastern larch (tree)
larch *volume 7 page 109*

eastern lowland gorilla (primate)
gorilla *volume 5 page 129*

eastern mud snake (reptile)
various snakes *picture, volume 12 page 113*

Eastern Orthodox Churches (Christianity)

MAIN ARTICLE *volume 4 page 93*

MORE TO EXPLORE

architecture *volume 1 page 169*
Alexander Nevsky Cathedral, Sofia *picture, volume 12 page 122*
Alexander Nevsky Cathedral, Tallinn *picture, volume 13 page 13*
Saint Basil Cathedral, Moscow *picture, volume 4 page 94, picture, volume 8 page 186*
Saint Sava Church, Belgrade *picture, volume 2 page 56*
Uspenski Cathedral, Helsinki *picture, volume 6 page 36*

beliefs and practices

Bible *volume 2 page 67*
mass *picture, volume 3 page 113*
monk *volume 8 page 166*
Palm Sunday *picture, volume 8 page 137*

saint *volume 12 page 9*

Byzantine Empire *volume 2 page 159*

Christianity *volume 3 page 112*

Europe *volume 4 page 162*

Roman Catholicism *volume 11 page 83*

Eastern Roman Empire (historic empire in Eurasia): *see in index* Byzantine Empire

Eastern Shoshone (Native American people): *see in index* Wind River Shoshone

Eastern Woodlands Indian (Native American people): *see in index* Abnaki; Algonquian; Cayuga; Delaware; Fox; Illinois; Iroquois; Malecite; Massachusetts; Mohawk; Mohegan; Mohican; Narraganset; Nipmuc; Ojibwa; Oneida; Onondaga; Ottawa; Pequot; Potawatomi; Powhatan; Sauk; Seneca; Shawnee; Tuscarora; Wampanoag; Wappinger; Winnebago; Wyandot

East Germany (historical subdivision of Germany): *see in index* Germany, East

East India Company (British trading company)
India *volume 6 page 124*

East Indies (islands in the Indian and Pacific Oceans)

MAIN ARTICLE *volume 4 page 94, picture, volume 4 page 95*

East Malaysia (region in Malaysia)
Malaysia *volume 8 page 27*

Eastman, George (U.S. inventor)
camera *volume 3 page 21*
photography *volume 10 page 77*

East Pakistan (historical region of Pakistan)
Bangladesh *volume 2 page 22*

East Point (eastern end of Prince Edward Island, Canada) *picture, volume 10 page 150*

East Slav (people)
Russia *volume 11 page 105*

East Timor (island country in the Malay archipelago)
MAIN ARTICLE *volume 4 page 96*

MORE TO EXPLORE

traditional dance *picture, volume 4 page 96*

East-West Schism (Christianity): *see in index* 1054, Schism of

East Wing (White House offices, Washington, D.C., U.S.)
White House *volume 15 page 41*

ebony langur (monkey) *picture, volume 8 page 168*

echidna (mammal)
MAIN ARTICLE *volume 4 page 97*

MORE TO EXPLORE

short-nosed echidna *picture, volume 4 page 97*

echinoderm (animal)

animal *volume 1 page 124*
invertebrate *volume 6 page 144*

echolocation (animal behavior)

whale *volume 15 page 38*

eclipse (astronomy)

MAIN ARTICLE *volume 4 page 97, picture, volume 4 page 98*

MORE TO EXPLORE

Cook *volume 3 page 193*
Moon *volume 8 page 179*
solar eclipse *picture, volume 4 page 98*

ecology (biological science)

MAIN ARTICLE *volume 4 page 99*

MORE TO EXPLORE

ecologist studying pitcher plants *picture, volume 4 page 99*

Economic and Social Council (United Nations)

United Nations *volume 14 page 23*

economics (science)

MAIN ARTICLE *volume 4 page 99*

MORE TO EXPLORE

colony *volume 3 page 155*
village market *picture, volume 4 page 100*

economic system: *see in index* capitalism; communism; socialism

economy

transportation *volume 13 page 92*

ECOSOC (United Nations): *see in index* Economic and Social Council

ecosystem (life science)

MAIN ARTICLE *volume 4 page 101, picture, volume 4 page 101*

MORE TO EXPLORE

biome *volume 2 page 74*
food chain *volume 5 page 45, picture, volume 5 page 45*

ECSC (European organization): *see in index* European Coal and Steel Community

Ecuador (country in South America)

MAIN ARTICLE *volume 4 page 102*

MORE TO EXPLORE

Bolívar *volume 2 page 101*
geography

Cotopaxi *picture, volume 4 page 103*

Galápagos Islands *volume 5 page 81, picture, volume 5 page 81*

Quito *picture, volume 11 page 11*

images

street market *picture, volume 4 page 103*

tapir *picture, volume 13 page 17*

Ederle, Gertrude (U.S. athlete)

swimming *volume 12 page 217*

Edict of: *see in index under the specific part of the name, for example, Nantes, Edict of*

Edinburgh (capital city of Scotland)

MAIN ARTICLE *volume 4 page 104*

MORE TO EXPLORE

Edinburgh Castle *picture, volume 4 page 104*
Scotland *volume 12 page 52*

Edinburgh Castle (castle in Edinburgh, Scotland, United Kingdom) *picture, volume 4 page 104*

Edinburgh *volume 4 page 104*

Edison, Thomas Alva (U.S. inventor)

MAIN ARTICLE *volume 4 page 105, picture, volume 4 page 105*

MORE TO EXPLORE

1877 Edison phonograph *picture, volume 12 page 135*
Edison with lightbulb *picture, volume 13 page 27*
movie *volume 8 page 199*
sound recording *volume 12 page 136*
technology and invention *volume 13 page 27*

editing

newspaper *volume 9 page 54*

editor: *see in index* editing

editorial cartoon: *see in index* political cartoon

Edmonton (provincial capital of Alberta, Canada)
Alberta *volume 1 page 69*

Edmonton Oilers (Canadian hockey team)
Gretzky *volume 5 page 161*

Edo (capital city of Japan): *see in index* Tokyo

Edo period (Japanese history): *see in index* Tokugawa period

education

MAIN ARTICLE *volume 4 page 105*

MORE TO EXPLORE

zoo *volume 15 page 108*

Education, Department of (U.S. government agency)

United States government executive departments *table, volume 14 page 35*

Edward I (king of England)

Wales *volume 15 page 5*

Edward VI (king of England and Ireland)

Elizabeth I *volume 4 page 125*
Henry VIII *volume 6 page 39*

Edward VIII (king of the United Kingdom)

Elizabeth II *volume 4 page 126*

EEC (European economic association): *see in index* European Economic Community

eel (fish)

MAIN ARTICLE *volume 4 page 107, picture, volume 4 page 107*

effigy mound (anthropology) *picture, volume 8 page 194*
mound builders *volume 8 page 194*

egg (reproductive cell)

MAIN ARTICLE *volume 4 page 108*

MORE TO EXPLORE

chicken *volume 3 page 95*
chromosome *volume 3 page 116*
fish *volume 5 page 28*
gender determination *picture, volume 5 page 93*
genetics *volume 5 page 93*
insects
flea *volume 5 page 33*
ladybug *picture, volume 4 page 108*
mosquito *volume 8 page 189*
mammals
echidna *volume 4 page 97*
platypus *volume 10 page 99*
metamorphosis *volume 8 page 107*
mollusk *volume 8 page 157*
squid *volume 12 page 172*
pollen *volume 10 page 116*
reproductive system *volume 11 page 48*
human ovary and egg cycle *picture, volume 11 page 48*
reptiles
dinosaur *picture, volume 4 page 52*
eastern box turtle *picture, volume 11 page 53*

shell *volume 12 page 80*

egg yolk (animal reproduction): *see in index* yolk

egret (bird)

heron *volume 6 page 47*

Egypt (country in the Middle East)

MAIN ARTICLE *volume 4 page 109*

MORE TO EXPLORE

brass wares *picture, volume 2 page 124*

geography

Cairo *picture, volume 1 page 159, picture, volume 3 page 9, picture, volume 4 page 110*

Middle East *volume 8 page 124*

Nile River *picture, volume 9 page 72*

Nile River delta *picture, volume 4 page 33*

Suez Canal *volume 12 page 201*

history

Amman *volume 1 page 108*

ancient Egypt: *see in index* Egypt, ancient

Arab-Israeli Wars *volume 1 page 158*

Crusades *volume 3 page 224*

Israel *volume 6 page 169*

timeline *volume 4 page 109*

World War II *volume 15 page 67*

pyramids

Great Pyramids of Giza *picture, volume 4 page 110*

Saqqarah *picture, volume 1 page 168*

Egypt, ancient

MAIN ARTICLE *volume 4 page 112*

MORE TO EXPLORE

agriculture

flood *volume 5 page 33*

grapes *volume 5 page 139*

archery *volume 1 page 166*

arts

architecture *volume 1 page 168*

pyramid *volume 10 page 170*

Pyramids of Giza *picture, volume 4 page 110, picture, volume 10 page 170*

Temple of Abu Simbel *picture, volume 4 page 112*

dance *volume 4 page 12*

painting *volume 10 page 8*

sculpture *volume 12 page 56*

Nefertiti *picture, volume 4 page 114*

Ramses II *picture, volume 10 page 69*

seated figures *picture, volume 4 page 112*

sphinx *volume 12 page 163, picture, volume 12 page 163*

government

census *volume 3 page 71*

pharaoh *volume 10 page 68*

postal service *volume 10 page 136*

history

Alexander the Great *volume 1 page 73*

civilization *volume 3 page 127*

Cleopatra *volume 3 page 134*

Kush *volume 7 page 90*

Nubia *volume 9 page 103, volume 12 page 200*

Passover *volume 10 page 39*

mythology

Isis and Osiris *volume 6 page 162, picture, volume 6 page 163*

Ra *volume 11 page 30*

Nile River *volume 9 page 72*

people and culture

cats *volume 3 page 58*

cosmetics *volume 3 page 202*

ibis *volume 6 page 106*

mummy *volume 8 page 205*

tomb paintings *picture, volume 4 page 113, picture, volume 6 page 53*

science and technology

calendar *volume 3 page 10*

glass *volume 5 page 119*

hieroglyphic writing *volume 6 page 53*

writing *volume 15 page 77*

levee and dike *volume 7 page 136*

lighthouse *volume 7 page 150*

mining *volume 8 page 134*

numbers and number systems *volume 9 page 106*

sundial *volume 12 page 204*

time *volume 13 page 69*

vegetable fiber *picture, volume 5 page 16*

Egyptian lotus (freshwater plant family)

water lily *volume 15 page 25*

Egyptian mythology (legends and stories of ancient Egypt): *see in index* Isis; Ra

Eiffel, Gustave (French engineer)

Eiffel Tower *volume 4 page 115*

Eiffel Tower (tower in Paris, France)

MAIN ARTICLE *volume 4 page 115, picture, volume 4 page 115*

MORE TO EXPLORE

Paris *volume 10 page 34*

1812, War of (British-U.S. history): *see in index* War of 1812

1850, Compromise of (U.S. history)

Fillmore *volume 5 page 21*

Taylor *volume 13 page 23*

Eightfold Path (Buddhist doctrine)

Buddhism *volume 2 page 144*

Einstein, Albert (German-U.S. physicist)

MAIN ARTICLE *volume 4 page 116, picture, volume 4 page 116*

MORE TO EXPLORE

physics *volume 10 page 79*

Éire (country in Europe): *see in index*

Ireland

Eisenhower, Dwight D. (president of the U.S.)

MAIN ARTICLE *volume 4 page 117, picture, volume 4 page 117*

MORE TO EXPLORE

Nixon *volume 9 page 74*

timeline *volume 4 page 117*

Elbert, Mount (mountain in Colorado, U.S.)

Colorado *volume 3 page 157*

election (political process)

republic *volume 11 page 53*

United States

ballot *picture, volume 10 page 114*

electoral college vote certificate *picture, volume 4 page 119*

voting *volume 14 page 105*

voters in Sierra Leone *picture, volume 4 page 35*

electoral college (U.S. government)

MAIN ARTICLE *volume 4 page 119, picture, volume 4 page 119*

MORE TO EXPLORE

United States government *volume 14 page 34*

electric car (automobile)

automobile *volume 1 page 236*

electric clock (instrument): *see in index* electrical clock

electric current (physics)

electricity *volume 4 page 120*

electronics *volume 4 page 122*

telephone *volume 13 page 36*

electricity (physics)

MAIN ARTICLE *volume 4 page 120*

MORE TO EXPLORE

energy *volume 4 page 138*

coal *volume 3 page 144*

solar energy *volume 12 page 125*

Franklin *volume 5 page 63*
 lightning *picture, volume 4 page 120*
 magnet *volume 8 page 18*
 static electricity *picture, volume 4 page 121*
 technology and invention *volume 13 page 27*
 clock *volume 3 page 141*
 Ice Festival in China *picture, volume 5 page 13*
 wind turbine *picture, volume 4 page 137, picture, volume 15 page 50*

electric locomotive (transportation)
 railroad *volume 11 page 20*

electric motor
 submarine *volume 12 page 198*

electric ray (fish)
 ray *volume 11 page 30*

electric signal
 electronics *volume 4 page 122*
 telephone *volume 13 page 36*

electrode (electronics)
 battery *volume 2 page 39, picture, volume 2 page 40*

electrolyte (chemistry and physics)
 battery *volume 2 page 39, picture, volume 2 page 40*

electromagnet (device)
 magnets and magnetism *volume 8 page 18*

electromagnetic radiation (physics)
 radiation *volume 11 page 16*
 types *picture, volume 11 page 18*
 wavelengths *picture, volume 11 page 17*

electron (subatomic particle)
 atom *volume 1 page 224, picture, volume 1 page 225*
 electricity *volume 4 page 120*
 magnetism *volume 8 page 18*
 molecule *volume 8 page 156*
 television *volume 13 page 41*

electronic catalog (library science)
 library *volume 7 page 143*

electronic communication: *see in index* telecommunication

electronic device (technology)
 navigation *volume 9 page 24*

electronic game
 MAIN ARTICLE *volume 4 page 121*

MORE TO EXPLORE
 toy *volume 13 page 84*

electronic mail (electronic communication): *see in index* e-mail

electronic printing
 printing *volume 10 page 152*

electronics (technology and physics)
 MAIN ARTICLE *volume 4 page 122*

electron microscope (scientific instrument)
 microscope *volume 8 page 121*

electrum (alloy)
 money *volume 8 page 161*

element (chemistry): *see in index* chemical element

elementary education
 education *volume 4 page 106*
 Somalia *picture, volume 8 page 151*
 students in classroom *picture, volume 4 page 106*

“Elements” (work by Euclid)
 mathematics *volume 8 page 77*

elephant (mammal)
 MAIN ARTICLE *volume 4 page 123, picture, volume 4 page 123, picture, volume 9 page 100*

MORE TO EXPLORE
 African elephant *picture, volume 4 page 123*
 aging *volume 1 page 48*
 ancient wars *picture, volume 15 page 9*
 Asian elephant *picture, volume 4 page 124*
 crossing a stream *picture, volume 3 page 180*
 mammoth and mastodon *volume 8 page 76, picture, volume 8 page 76*
 Thailand *picture, volume 13 page 55*

elephant bird (extinct bird)
 flightless birds *volume 2 page 79*

elephant seal (mammal)
 seal *volume 12 page 59*

Eleuthera (island in the Bahamas)
 The Bahamas *volume 2 page 8*

elevator (aircraft part)
 airplane *volume 1 page 55*

elevator (vertical transport)
 skyscraper *volume 12 page 104*

El Greco (Spanish painter): *see in index* Greco, El

Eliot, John (British missionary)
 Massachusetts *volume 8 page 70*

Elizabeth I (queen of England)
 MAIN ARTICLE *volume 4 page 125, picture, volume 4 page 125*

MORE TO EXPLORE
 at the head of Parliament *picture, volume 10 page 38*
 Drake *volume 4 page 70*
 English colonies *picture, volume 1 page 105*
 Henry VIII *volume 6 page 39*
 Mary, Queen of Scots *volume 8 page 67*

Elizabeth II (queen of the United Kingdom)
 MAIN ARTICLE *volume 4 page 126, picture, volume 4 page 126*

Elizabethan Age (English history)
 Elizabeth I *volume 4 page 125*

elk (mammal grouping)
 MAIN ARTICLE *volume 4 page 127*
 MORE TO EXPLORE

American elk, or wapiti *picture, volume 4 page 127*

Elk Tongue (Native American) *picture, volume 7 page 70*

Ellice Islands (island country in the Pacific Ocean): *see in index* Tuvalu

Ellington, Duke (U.S. composer and jazz band leader)
 jazz *volume 7 page 16*

elliptical galaxy (astronomy)
 galaxy *volume 5 page 81*

Ellis, William Webb (British athlete)
 rugby *volume 11 page 103*

Ellis Island (island in New York, U.S.)
 MAIN ARTICLE *volume 4 page 127, picture, volume 4 page 127, picture, volume 4 page 128*

MORE TO EXPLORE
 citizenship ceremony *picture, volume 3 page 121*
 New York City *volume 9 page 60*

elm (tree)
 MAIN ARTICLE *volume 4 page 128*
 MORE TO EXPLORE
 American elm *picture, volume 4 page 128*

English elm *picture, volume 13 page 94*

Elowah Falls (waterfall in Oregon, U.S.)
picture, volume 9 page 147

El Salvador (country in South America)
MAIN ARTICLE *volume 4 page 129*

MORE TO EXPLORE

geography

landslide damage *picture, volume 7 page 104*

San Salvador *picture, volume 12 page 30*

elver (eel)

eel *volume 4 page 108*

Elvish (language)

Tolkien *volume 13 page 77*

e-mail (electronic communication)

Internet *volume 6 page 142*

Emancipation Proclamation (U.S. history, 1863)

MAIN ARTICLE *volume 4 page 130, picture, volume 4 page 130*

MORE TO EXPLORE

abolitionist movement *volume 1 page 12*

African Americans *volume 1 page 43*

American Civil War *volume 1 page 97*

Lincoln *volume 7 page 156*

Embalse del Río Negro (artificial lake in Uruguay)

Uruguay *volume 14 page 42*

embryo (animal reproduction)

chromosome *volume 3 page 116*

egg *volume 4 page 108*

vertebrate embryo development *picture, volume 5 page 109*

embryo (plant)

seed *volume 12 page 62*

emerald (gemstone)

jewelry and gems *volume 7 page 24*

Emerald Isle (island in Europe): *see in index* Ireland

emergency medical technician *picture, volume 1 page 93*

ambulance *volume 1 page 93*

emergency room (hospital area)

hospital *volume 6 page 88*

emotion (psychology)

adolescence *volume 1 page 31*

emotional memory (mental function)
memory *volume 8 page 98*

emperor (title): *see in index* empire

emperor penguin (bird) *picture, volume 10 page 52*

penguins *volume 10 page 53*

emphysema (medical disorder)

lung *volume 7 page 184*

empire (political entity)

MAIN ARTICLE *volume 4 page 130*

Empire State (state in the U.S.): *see in index* New York

Empire State Building (building in New York City, New York, U.S.)

skyscraper *volume 12 page 105*

world's tallest buildings *picture, volume 12 page 104*

EMT (medical personnel): *see in index* emergency medical technician

emu (bird) *picture, volume 2 page 79*

flightless birds *volume 2 page 79*

enamel (tooth)

teeth *volume 13 page 31*

encephalitis (disease)

MAIN ARTICLE *volume 4 page 132*

MORE TO EXPLORE

West Nile virus *volume 15 page 33*

X-ray photograph of brain *picture, volume 4 page 133*

“Encyclopædia Britannica” (English language reference work)
Edinburgh *volume 4 page 104*

“Encyclopédie” (French language reference work)
work of the Enlightenment *picture, volume 4 page 142*

endangered species

MAIN ARTICLE *volume 4 page 133*

MORE TO EXPLORE

animals

apes *volume 1 page 148*

bald eagle *picture, volume 4 page 86*

bonobo *volume 2 page 107*

California condor *picture, volume 4 page 133, picture, volume 15 page 108*

cheetah *volume 3 page 85*

elephant *volume 4 page 125*

extinct animals *volume 1 page 127*

orangutan *volume 9 page 145*

otter *volume 9 page 156*

panda *volume 10 page 25*

parrot family *volume 10 page 39*

tapir *volume 13 page 17*

tiger *volume 13 page 66*

Arctic Ocean *volume 1 page 173*

zoo *volume 15 page 108*

“Endeavor” (U.S. space shuttle)

Jemison *volume 7 page 20, picture, volume 7 page 20*

endocrine system (human physiology)

MAIN ARTICLE *volume 4 page 134, picture, volume 4 page 135, picture, volume 4 page 136*

endodermis (botany)

root *picture, volume 11 page 96*

endoskeleton (anatomy): *see in index* skeleton

endosperm (plant tissue)

grain *volume 5 page 134*

seed *volume 12 page 62*

end zone (sports)

football *volume 5 page 48*

energy (physics)

MAIN ARTICLE *volume 4 page 137*

MORE TO EXPLORE

energy sources *picture, volume 4 page 139*

food and nutrition *volume 5 page 43*

fossil fuel *volume 5 page 55*

muscle *volume 8 page 208*

physics *volume 10 page 78*

energy, alternative: *see in index* alternative energy

Energy, Department of (U.S. government agency)

United States government executive departments *table, volume 14 page 35*

energy consumption

Carter *volume 3*

Engelmann prickly pear (cactus) *picture, volume 3 page 6*

engine (technology): *see in index* internal-combustion engine; steam engine

England (part of the United Kingdom)

MAIN ARTICLE *volume 4 page 139*

MORE TO EXPLORE

geography

- Cotswolds *picture, volume 4 page 140*
 English Channel *volume 4 page 141*
 wetland ecosystem *picture, volume 4 page 101*
 Yorkshire heather *picture, volume 6 page 33*
 history
 Anglo-Saxon *volume 1 page 121*
 Alfred the Great *volume 1 page 75*
 Bede's history *picture, volume 6 page 64*
 banking *volume 2 page 25*
 Elizabeth I *picture, volume 10 page 38*
 exploration and settlement of the Americas *volume 1 page 102*
 Cabot *volume 3 page 4*
 Native Americans *volume 9 page 19*
 Squanto *volume 12 page 170*
 France *volume 5 page 59*
 Joan of Arc *volume 7 page 25*
 Industrial Revolution *volume 6 page 133*
 Ireland *volume 6 page 155*
 Magna Carta *volume 3 page 189, volume 8 page 17*
 Middle Ages
 archery *volume 1 page 166*
 Northern Ireland *volume 9 page 90*
 Spanish Armada *volume 1 page 183*
 Stonehenge *picture, volume 12 page 190*
 Ulster *volume 14 page 8*
 United Kingdom *volume 14 page 16*
 Vikings *volume 14 page 89*
 Wales *volume 15 page 4*
 measurement *volume 8 page 89*
 people and culture
 drama *volume 4 page 73*
 sports
 boxing *volume 2 page 119*
 cricket *volume 3 page 214*
 ice skating *volume 6 page 110*
 rugby *volume 11 page 102*
 theater *volume 13 page 58*
- England, Church of** (English national church)
 Henry VIII *volume 6 page 39*
 Protestantism *volume 10 page 158*
 Puritans *volume 10 page 168*
 Reformation *volume 11 page 39*
- English Channel** (arm of the Atlantic Ocean in Europe)
 MAIN ARTICLE *volume 4 page 141*
 MORE TO EXPLORE
 swimming *volume 12 page 216*
- English Civil Wars** (English history)
 England *volume 4 page 141*
- English cocker spaniel** (breed of dog)
 sporting dogs *table, volume 4 page 62*
- English daisy** (flowering plant)
 daisy *volume 4 page 6*
- English elm** (tree)
 comparison with Lawson cypress *picture, volume 13 page 94*
 elm *volume 4 page 128*
- English ivy** (plant)
 ivy *volume 6 page 175*
- English language**
 grammar *volume 5 page 135*
 Norman Conquest *volume 9 page 78*
 North America *volume 9 page 81*
- English oak** (tree)
 oak *volume 9 page 114*
- English sparrow** (bird): *see in index*
 house sparrow
- English system**
 measurement *volume 8 page 89*
- English yew** (botany)
 yew *volume 15 page 92*
- Enlightenment** (European history)
 MAIN ARTICLE *volume 4 page 142*
 MORE TO EXPLORE
 Europe *volume 4 page 164*
 human rights *volume 6 page 97*
 meeting to discuss "L'Encyclopédie" *picture, volume 4 page 142*
 philosophy *volume 10 page 73*
- Enrage, Cape** (cape in New Brunswick, Canada)
 Cape Enrage Lighthouse *picture, volume 9 page 42*
- entertainment:** *see in index* ballet; circus; electronic game; magic; movie; opera; orchestra; sports; theater
- environment** (biology)
 MAIN ARTICLE *volume 4 page 143*
 MORE TO EXPLORE
 Earth Day *volume 4 page 91*
 endangered species *volume 4 page 133*
 irrigation *volume 6 page 162*
 regional issues
 Amazon River *volume 1 page 92*
 Aral Sea *volume 1 page 160*
- Arctic Ocean *volume 1 page 173*
 Atlantic Ocean *volume 1 page 221*
- enzyme** (biochemistry)
 MAIN ARTICLE *volume 4 page 144, picture, volume 4 page 144*
 MORE TO EXPLORE
 fermentation *volume 5 page 11*
 pancreas *volume 10 page 24, picture, volume 10 page 24*
- Eohippus** (fossil equine genus)
 evolution *picture, volume 4 page 170*
- Eoraptor** (dinosaur)
 MAIN ARTICLE *volume 4 page 145, picture, volume 4 page 145*
 MORE TO EXPLORE
 dinosaur *picture, volume 4 page 53*
- epic** (type of literature)
 literature *volume 7 page 161*
- "Epic of Gilgamesh"** (Mesopotamian literature)
 literature *volume 7 page 161*
- epidemic** (disease outbreak)
 MAIN ARTICLE *volume 4 page 146*
 MORE TO EXPLORE
 influenza *picture, volume 6 page 136*
 plague *volume 10 page 91*
 SARS *volume 12 page 38, picture, volume 4 page 146*
- epidermis** (anatomy)
 skin *volume 12 page 101, picture, volume 12 page 101*
- epidermis** (plant tissue)
 root *picture, volume 11 page 96*
- epilepsy** (medical disorder)
 MAIN ARTICLE *volume 4 page 146*
- Epimetheus** (Greek mythology)
 Prometheus *volume 10 page 155*
- epiphyte** (type of plant)
 plant *volume 10 page 95*
- Epistles, The** (biblical text)
 Bible *volume 2 page 68*
- Epstein-Barr virus** (disease)
 mononucleosis *volume 8 page 170*
- Equal Pay Act** (U.S. legislation, 1963)
 women's rights *volume 15 page 58, picture, volume 15 page 57*
- equal rights**
 Tuskegee Airmen *volume 13 page 118*

equator (geography)MAIN ARTICLE *volume 4 page 147*

MORE TO EXPLORE

hemisphere *volume 6 page 37, picture, volume 4 page 147*latitude and longitude *volume 7 page 113*season *volume 12 page 61*tropics *volume 13 page 98***Equatorial Guinea** (country in Africa)MAIN ARTICLE *volume 4 page 148*

MORE TO EXPLORE

coast of Malabo *picture, volume 8 page 25***equilateral triangle** (mathematics)geometry *volume 5 page 98***equilibrium** (physiology)senses *volume 12 page 69***Equus** (mammal genus)evolution *picture, volume 4 page 170***Erasmus, Desiderius** (Dutch humanist and scholar)Renaissance *volume 11 page 45***Erechtheum** (temple in Athens, Greece)Athens *volume 1 page 19***Erg Admer** (area of sand dunes in southern Algeria) *picture, volume 1 page 78***ergot** (plant disease)rye *volume 11 page 111***Erie** (city in Pennsylvania)Lake Erie *picture, volume 4 page 149***Erie, Lake** (lake in North America)MAIN ARTICLE *volume 4 page 149, picture, volume 4 page 149*

MORE TO EXPLORE

Cleveland *picture, volume 9 page 126*Great Lakes *volume 5 page 147***Erie Canal** (canal in the U.S.)MAIN ARTICLE *volume 4 page 149, picture, volume 4 page 150*

MORE TO EXPLORE

Albany *volume 1 page 67*canal *volume 3 page 28*New York *volume 9 page 59***Eriksson, Leif** (Viking explorer): *see in index* Leif Eriksson**Erik the Red** (Norse explorer)Greenland *volume 5 page 158***Eritrea** (country in East Africa)MAIN ARTICLE *volume 4 page 151, picture, volume 4 page 151*

MORE TO EXPLORE

Ethiopia *volume 4 page 156***Eros** (Greek god)Aphrodite *volume 1 page 149***erosion** (geology)MAIN ARTICLE *volume 4 page 152*

MORE TO EXPLORE

canyon *volume 3 page 31*Grand Canyon *volume 5 page 136*landslide *volume 7 page 104*processes of erosion *picture, volume 4 page 152*rock *volume 11 page 76*sand *volume 12 page 26*soil *volume 12 page 124*valley *volume 14 page 52***eruption** (volcanic activity): *see in index* volcano**Esfahan** (city in Iran)mosque courtyard *picture, volume 6 page 148***Eskimo** (people)MAIN ARTICLE *volume 4 page 153*

MORE TO EXPLORE

people

Eskimo family inside igloo *picture, volume 4 page 153*Inuit fisherwoman *picture, volume 9 page 96*Peary *volume 10 page 48*

places

Canada

Northwest Territories *volume 9 page 95*Nunavut *volume 9 page 108*Quebec *volume 11 page 9*Greenland *volume 5 page 158*tundra *volume 13 page 108***esophagus** (anatomy)digestive system *volume 4 page 47*grasshopper *picture, volume 4 page 48*human *picture, volume 4 page 47***Español:** *see in index* Spanish language**Estates-General** (French history)French Revolution *volume 5 page 69*Louis XVI *volume 7 page 179***Estéban** (African-Spanish explorer)Zuni *volume 15 page 110***Esther** (biblical figure)Purim *volume 10 page 168***estivation** (zoology)reptile *volume 11 page 52***Estonia** (country in Europe)MAIN ARTICLE *volume 4 page 154*

MORE TO EXPLORE

Alexander Nevsky Cathedral *picture, volume 13 page 13***estuarine crocodile** (reptile) *picture, volume 3 page 220*description *volume 3 page 221*snout *picture, volume 1 page 85, picture, volume 3 page 221***ETA** (Basque group)Basques *volume 2 page 36***ether** (chemical compound)surgery *volume 12 page 207***Ethiopia** (country in East Africa)MAIN ARTICLE *volume 4 page 155*

MORE TO EXPLORE

Simien Mountains National Park *picture, volume 4 page 155*women carrying water *picture, volume 4 page 156***Ethiopian Orthodox church** (Christianity)Aksum *volume 1 page 59*church building in Addis Ababa *picture, volume 1 page 28***Ethiopian wolf** (mammal)wolf *volume 15 page 54***Etna, Mount** (volcano in Italy)MAIN ARTICLE *volume 4 page 157***Etruscans** (people)ancient Rome *volume 11 page 89*Italy *volume 6 page 173***EU** (European organization): *see in index* European Union**eucalyptus** (tree)MAIN ARTICLE *volume 4 page 157, picture, volume 4 page 157, picture, volume 13 page 94*

MORE TO EXPLORE

koala *volume 7 page 76***eucalyptus oil**eucalyptus *volume 4 page 158***Euclid** (Greek mathematician)mathematics *volume 8 page 77*

Euoplocephalus (dinosaur)

MAIN ARTICLE *volume 4 page 158*, picture, *volume 4 page 158*

MORE TO EXPLORE

dinosaur *volume 4 page 51*, picture, *volume 4 page 53*

Euphrates River (river in the Middle East)

MAIN ARTICLE *volume 4 page 159*, picture, *volume 4 page 159*

MORE TO EXPLORE

Iraq *volume 6 page 151*
Tigris *volume 13 page 66*

Eurasian beaver (rodent) picture, *volume 2 page 44*

beaver *volume 2 page 44*

Eurasian magpie (bird)

magpie *volume 8 page 20*

Eurasian red squirrel (rodent) picture, *volume 12 page 172***Eurasian sparrowhawk** (bird) picture, *volume 6 page 28***Eurasian tree sparrow** (bird) picture, *volume 12 page 160***Euratom** (European organization): *see in index* European Atomic Energy Community**euro** (currency unit) picture, *volume 4 page 165*

European Union *volume 4 page 165*

Europa (moon of Jupiter)

Jupiter *volume 7 page 41*

Europe (continent)

MAIN ARTICLE *volume 4 page 160*

MORE TO EXPLORE

arts

classical music *volume 3 page 132*

drawing *volume 4 page 76*

folk music *volume 5 page 41*

Renaissance art: *see in index* Renaissance

geography

Alps *volume 1 page 89*, picture, *volume 1 page 90*

Amalfi coast picture, *volume 8 page 94*

Black Forest farm picture, *volume 5 page 105*

Czech countryside picture, *volume 3 page 240*

Lithuanian lake picture, *volume 7 page 165*

For more about Europe, look for articles on these countries:

Albania	Luxembourg
Andorra	Macedonia
Austria	Malta
Belarus	Moldova
Belgium	Monaco
Bosnia and Herzegovina	Montenegro
Bulgaria	Netherlands, The
Croatia	Norway
Cyprus	Poland
Czech Republic	Portugal
Denmark	Romania
Estonia	Russia
Finland	San Marino
France	Serbia
Georgia	Slovakia
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Iceland	Switzerland
Ireland	Turkey
Italy	Ukraine
Latvia	United Kingdom
Liechtenstein	
Lithuania	

Netherlands waterway picture, *volume 9 page 38*

Norwegian fjord picture, *volume 4 page 162*

Pyrenees picture, *volume 10 page 171*, picture, *volume 12 page 153*

history

Asia *volume 1 page 204*

Enlightenment: *see in index* Enlightenment

epidemic *volume 4 page 146*

exploration of the Americas: *see in index* Americas

Holocaust: *see in index* Holocaust

Huns *volume 6 page 99*

Middle Ages: *see in index* Middle Ages

Native Americans *volume 9 page 19*

Renaissance: *see in index* Renaissance

World Wars: *see in index* World War I; World War II

people and culture

armor picture, *volume 1 page 186*

brass *volume 2 page 123*

Christmas *volume 3 page 115*

glass *volume 5 page 119*

North America *volume 9 page 81*

traditional dress

Romania picture, *volume 11 page 85*

Sami people picture, *volume 9 page 98*

Spain picture, *volume 4 page 162*

social issues

human migration *volume 8 page 128*

labor *volume 7 page 97*

slavery *volume 12 page 106*

European aspen (tree)

aspen *volume 1 page 210*

European Atomic Energy Community

European Union *volume 4 page 165*

European bison (mammal)

bison *volume 2 page 82*

European chestnut (tree)

chestnut *volume 3 page 89*

European Coal and Steel Community

European Union *volume 4 page 165*

European Commission (European organization)

European Union *volume 4 page 165*

European Economic Community

European Union *volume 4 page 165*

European eel (fish) picture, *volume 4 page 107***European hedgehog** (mammal) picture, *volume 6 page 33***European larch** (tree)

conifer picture, *volume 3 page 183*

larch *volume 7 page 109*

European mink (mammal)

mink *volume 8 page 134*

European mole (mammal) picture, *volume 8 page 155***European Parliament**

European Union *volume 4 page 165*

European peoples: *see in index* Alemanni; Anglo-Saxon; Basque; Bulgar; Celt; Etruscans; Frank; Illyrian; Lombard; Norman; Rom; Sami; Saxon; Slav; Viking; Walloon

European rhinoceros beetle (insect)

types of beetles picture, *volume 2 page 49*

European robin (bird) picture, *volume 11 page 72*

robin *volume 11 page 72*

European UnionMAIN ARTICLE *volume 4 page 165*

MORE TO EXPLORE

Europe *volume 4 page 164*France *volume 5 page 60*Ireland *volume 6 page 156*Netherlands *volume 9 page 39***European Union, Council of the**European Union branches *volume 4 page 165***European viper** (snake): *see in index*
common adder**European water vole** (rodent)
vole *volume 14 page 102***European wayfaring tree**
viburnum *volume 14 page 76***European white pelican** (bird)
pelican *volume 10 page 51***Eurydice** (Greek mythology)
MAIN ARTICLE *volume 9 page 151, picture, volume 9 page 151***Eurystheus** (Greek mythology)
Heracles *volume 6 page 44***Euskadi Ta Askatasuna** (Basque group):
see in index ETA**Euskara** (language)
Basques *volume 2 page 36*
Spain *volume 12 page 154***eustachian tube** (anatomy)
structure of the ear *picture, volume 4 page 87***evangelism** (Christianity): *see in index*
missions**evaporation** (phase change)
MAIN ARTICLE *volume 4 page 166, picture, volume 4 page 166*
MORE TO EXPLORE
crystal *volume 3 page 226*
water *volume 15 page 22, picture, volume 15 page 23***Everest, Mount** (mountain in Asia)
MAIN ARTICLE *volume 4 page 167, picture, volume 4 page 167*
MORE TO EXPLORE
Hillary *volume 6 page 54*
Himalayas *volume 6 page 55*
Nepal *volume 9 page 31*
Tenzing Norgay *volume 13 page 46***Everglades** (region in Florida, U.S.)
MAIN ARTICLE *volume 4 page 167, picture, volume 4 page 168***Everglades National Park** (national park in Florida, U.S.)
alligator near a trail *picture, volume 5 page 34*
Everglades *volume 4 page 167***evergreen** (plant)
holly *volume 6 page 70*
tree *volume 13 page 94***Evergreen State** (state in the U.S.): *see in index* Washington**Evers, Medgar** (U.S. civil-rights activist)
MAIN ARTICLE *volume 4 page 168, picture, volume 4 page 169***evidence** (law)
police *volume 10 page 112***evolution** (scientific theory)
MAIN ARTICLE *volume 4 page 169, picture, volume 4 page 170*
MORE TO EXPLORE
adaptation *volume 1 page 27*
Darwin *volume 4 page 17*
Galápagos Islands *volume 5 page 80*
human origins *volume 6 page 93*
mutation *volume 8 page 220***evolution, human:** *see in index* human
evolution**Ewe** (people)
Togo *volume 13 page 74***ewe** (sheep)
ewe with two lambs *picture, volume 12 page 78***excavation** (archaeology)
archaeology *volume 1 page 163*
excavation in Peru *picture, volume 1 page 164***excretion** (biology)
living thing *volume 7 page 169*
lymph and blood vessels *picture, volume 7 page 190***executive branch** (government)
government *volume 5 page 132*
major executive departments *table, volume 14 page 35*
United States government *volume 14 page 34***exercise** (physical activity)MAIN ARTICLE *volume 4 page 171*

MORE TO EXPLORE

swimming *volume 12 page 215*Yoga *volume 15 page 93***exhaust stroke** (internal combustion)
internal-combustion engine *volume 6 page 141, picture, volume 6 page 140***exhaust system** (automotive)
automobile *volume 1 page 236, picture, volume 1 page 235***Exodus** (ancient Hebrew history and Old Testament story)
ancient Egypt *volume 4 page 114*
handwritten bible *picture, volume 2 page 67***exoskeleton** (anatomy)
MAIN ARTICLE *volume 4 page 172*
MORE TO EXPLORE
insect *volume 6 page 138, picture, volume 6 page 139*
cicada *picture, volume 4 page 173*
cockroach *volume 3 page 147*
invertebrate *volume 6 page 144*
krill *volume 7 page 87*
shell *volume 12 page 79*
skeletal system *volume 12 page 96***exosphere** (atmospheric region)
atmosphere *volume 1 page 223***expansion** (physics)
water *volume 15 page 23***experimental method:** *see in index* scientific method**exploration**
MAIN ARTICLE *volume 4 page 173*
MORE TO EXPLORE
bathyscaphe *picture, volume 4 page 174*
monument to explorers *picture, volume 4 page 173*
Moon exploration *picture, volume 4 page 175*
Renaissance *volume 11 page 46*
technology and invention *volume 13 page 26***exploration and settlement of the Americas:** *see in index* Americas**Explorer 1** (artificial satellite)
satellite *volume 12 page 41***explosion** (chemical reaction)
bomb *picture, volume 3 page 165*

For more about exploration, look for articles on these explorers:

Amundsen, Roald	Gama, Vasco da Henson, Matthew
Balboa, Vasco Núñez de	Jolliet, Louis
Cabot, John	La Salle, Sieur de
Cartier, Jacques	Leif Eriksson
Champlain, Samuel de	Magellan, Ferdinand
Columbus, Christopher	Marquette, Jacques
Cook, James	Peary, Robert E.
Coronado, Francisco	Pizarro, Francisco
Cortés, Hernán	Polo, Marco
De Soto, Hernando	Ponce de León, Juan
Dias, Bartolomeu	Verrazzano, Giovanni da
Drake, Francis	Vespucci, Amerigo
Frémont, John Charles	

combustion *volume 3 page 165*

explosive (chemical product)
quarrying *volume 11 page 7*

expressway (road)
earthquake damage *picture, volume 4 page 92*

external migration
human migration *volume 8 page 126*

external recycling (waste management)
recycling *volume 11 page 35*

extinction (animal)
MAIN ARTICLE *volume 1 page 126, picture, volume 1 page 126, picture, volume 1 page 127*

MORE TO EXPLORE
prehistoric life *volume 10 page 146*

extra point (sports)
football *volume 5 page 49*

eye (anatomy)
MAIN ARTICLE *volume 4 page 175, picture, volume 4 page 175*

MORE TO EXPLORE
cosmetics *volume 3 page 202*
gecko *picture, volume 4 page 176*
lens *volume 7 page 131*
octopus *picture, volume 4 page 176*

eyeglasses (optical aid)
lens *volume 7 page 131*

eyepiece (part of optical instrument)
microscope *volume 8 page 120*
telescope *volume 13 page 38, picture, volume 13 page 38*

Eyeries (village in Ireland) *picture, volume 6 page 155*

eyesight (physiology): *see in index* sight

Ezra's Temple (Judaism): *see in index*
Jerusalem, Temple of



F (temperature scale): *see in index* Fahrenheit

F-16 (military aircraft) *picture, volume 1 page 52*

FA (British sports organization): *see in index* Football Association

fable (story)
MAIN ARTICLE *volume 5 page 4*
MORE TO EXPLORE

Aesop *volume 1 page 35*
folktale *volume 5 page 42*
storytelling *volume 12 page 194*
"The Three Little Pigs" *picture, volume 5 page 4*

face-off (sports)
ice hockey *volume 6 page 68, picture, volume 6 page 68*

factory
images
assembly line *picture, volume 8 page 46*
polyester cloth *picture, volume 13 page 28*
sugar production *picture, volume 12 page 202*
World War II *picture, volume 15 page 69*
labor *volume 7 page 96, picture, volume 7 page 97*
manufacturing *volume 8 page 46*

Factory, the (Warhol's studio)
Warhol *volume 15 page 11*

factory ship
ship *volume 12 page 82*

factual memory (mental function)
memory *volume 8 page 98*

Fahd (king of Saudi Arabia)
Saudi Arabia *volume 12 page 45*

Fahrenheit (temperature scale)
common abbreviations *table, volume 1 page 8*

Fair Deal (U.S. history)
Truman *volume 13 page 101*

fairway (golf)
golf *volume 5 page 125*

fairy tale
Andersen *volume 1 page 116*
folktale *volume 5 page 43*
Grimm brothers *volume 5 page 163*
Little Red Riding Hood *picture, volume 5 page 43*
Pied Piper of Hamelin *picture, volume 5 page 162*
storytelling *volume 12 page 194*

falcon (bird)
MAIN ARTICLE *volume 5 page 4*
MORE TO EXPLORE
kestrel *picture, volume 5 page 5*

falconry (sport)
falcon *volume 5 page 4*

Falkland Islands (British colony in the South Atlantic Ocean)
MAIN ARTICLE *volume 5 page 5, picture, volume 5 page 5*

Falkland Islands War (British-Argentine history, 1982)
Argentina *volume 1 page 176*
Falkland Islands *volume 5 page 6*

fall (season): *see in index* autumn

fall (wrestling)
wrestling *volume 15 page 74*

Fallen Timbers, Battle of (U.S. history)
Shawnee *volume 12 page 78*

falling star (astronomy): *see in index* meteor

Fallingwater (house in Bear Run, Pennsylvania, U.S.) *picture, volume 15 page 75*

fallopian tube (anatomy) *picture, volume 11 page 47*

reproductive system *volume 11 page 48*

falls (geology): *see in index* waterfall

false cypress (tree)

cypress *volume 3 page 235*

false foot (protozoan cell behavior): *see in index* pseudopod

family (kinship)

family toasting marshmallows *picture, volume 12 page 121*

famine

MAIN ARTICLE *volume 5 page 6*

MORE TO EXPLORE

drought *volume 4 page 77*

Fang (people)

Gabon *volume 5 page 78*

Far East (region of Asia): *see in index* East Asia

farm (agriculture)

Albania *picture, volume 1 page 66*

France *picture, volume 6 page 162*

Germany *picture, volume 5 page 105*

Russia *picture, volume 11 page 105*

Saudi Arabia *picture, volume 6 page 161*

United States

Idaho *picture, volume 6 page 161*

Kentucky *picture, volume 7 page 57*

Ohio *picture, volume 9 page 126*

Pennsylvania *picture, volume 10 page 56*

farm cooperative (organization): *see in index* cooperative

farming: *see in index* agriculture

Faroe Islands (islands in the Atlantic Ocean)

Atlantic puffins *picture, volume 4 page 36*

farsightedness (visual disorder)

convex lens effect *picture, volume 7 page 131*

eye *volume 4 page 176*

lens *volume 7 page 131*

Farsi language

Iran *volume 6 page 147*

fascies (symbol)

fascism *volume 5 page 7, picture, volume 5 page 7*

fascism (political system)

MAIN ARTICLE *volume 5 page 7*

MORE TO EXPLORE

fascies of ancient Rome *picture, volume 5 page 7*

Fascist Party (political party in Italy)

Italy *volume 6 page 174*

fashion: *see in index* clothing

fasting (religious practice)

Ramadan *volume 11 page 25*

preparing meals *picture, volume 11 page 26*

fat

food and nutrition *volume 5 page 44*

skin *volume 12 page 101, picture, volume 12 page 101*

Father of His Country (president of the U.S.): *see in index* Washington, George

Father of New France (French explorer): *see in index* Champlain, Samuel de

Fat Tuesday (holiday): *see in index* Mardi Gras

Faubus, Orval Eugene (governor of Arkansas)

Arkansas *volume 1 page 181*

fault (sports)

tennis *volume 13 page 46*

fax machine (technology)

telephone *volume 13 page 38*

FDA (U.S. government agency): *see in index* Food and Drug Administration

FDIC (U.S. government organization): *see in index* Federal Deposit Insurance Corporation

feast day (commemoration)

saint *volume 12 page 9*

Feast of Lots (Jewish holiday): *see in index* Purim

feather (bird anatomy)

MAIN ARTICLE *volume 5 page 8, picture, volume 5 page 8*

MORE TO EXPLORE

bird *volume 2 page 76*

February Revolution (Russian history)

Russian Revolution *volume 11*

page 108, picture, volume 11 page 108

feces (biology)

intestines *volume 6 page 143*

Federal Aviation Administration (U.S. government agency)

airplane *volume 1 page 57*

Federal Capital Territory (region in Nigeria)

Abuja *volume 1 page 16*

Federal Deposit Insurance Corporation (U.S. government organization)

banking *volume 2 page 25*

New Deal *volume 9 page 44*

federalism (political science)

government *volume 5 page 133*

state government *volume 12 page 181*

United States Constitution *volume 14 page 32*

Federalist papers (U.S. political essays)

MAIN ARTICLE *volume 5 page 9, picture, volume 5 page 9*

MORE TO EXPLORE

Hamilton *volume 6 page 11*

United States Constitution *volume 14 page 32*

Federalist Party (historical political party of the U.S.)

Adams *volume 1 page 23*

Hamilton *volume 6 page 11*

Federal Reserve System (United States banking)

banking *volume 2 page 25*

federal system (political science): *see in index* federalism

Fédération Internationale de Football Association (sports organization)

soccer *volume 12 page 118*

Fédération Internationale de Volleyball (sports organization)

volleyball *volume 14 page 104*

“Fellowship of the Ring, The” (work by Tolkien)

Tolkien *volume 13 page 77*

felony (crime)

crime *volume 3 page 216*

felucca (boat)

Nile River travel near Luxor *picture, volume 9 page 72*

female (gender)

egg *volume 4 page 108*

femur (bone)

knee *volume 7 page 73*

leg *volume 7 page 123*

Ferdinand II (king of Spain)

MAIN ARTICLE *volume 5 page 10, picture, volume 5 page 10*

MORE TO EXPLORE

Columbus *volume 3 page 163*

Inquisition *volume 6 page 137*

Spain *volume 12 page 155*

fermentation (chemical reaction)

MAIN ARTICLE *volume 5 page 11, picture, volume 5 page 11*

MORE TO EXPLORE

enzyme *volume 4 page 145*

Pasteur *volume 10 page 40*

vanilla *volume 14 page 57*

vinegar *volume 14 page 92*

fern (plant)

MAIN ARTICLE *volume 5 page 11, picture, volume 5 page 12*

MORE TO EXPLORE

plant *volume 10 page 96*

Fernando Po (island and province in

Equatorial Guinea): *see in index* Bioko

Ferris wheel (ride)

London Eye *picture, volume 7 page 176*

Fertile Crescent (region of the Middle East)

MAIN ARTICLE *volume 5 page 12*

fertilization (reproduction)

reproductive system *volume 11 page 49*

fertilizer (agriculture)

herb *volume 6 page 45*

pollution *volume 10 page 118*

festival

MAIN ARTICLE *volume 5 page 13, picture, volume 5 page 13*

Festival of Lights (Hinduism): *see in index* Diwali

Festival of Lights (Judaism): *see in index* Hanukkah

fetus (embryology)

gestation *volume 5 page 109*

reproductive system *volume 11 page 49*

feudalism (social system)

MAIN ARTICLE *volume 5 page 13*

MORE TO EXPLORE

Europe *volume 4 page 164*

Marie-Antoinette *volume 8 page 55*

Middle Ages *volume 8 page 122*

serfs *picture, volume 5 page 14*

fever (medical disorder)

virus *volume 14 page 98*

fiber (thin strands of material)

MAIN ARTICLE *volume 5 page 16*

MORE TO EXPLORE

textile *volume 13 page 53*

weaver *picture, volume 9 page 37*

fiber-optic cable (electrical conductor)

laser *volume 7 page 111*

fiber optics (data transmitting science)

MAIN ARTICLE *volume 5 page 14, picture, volume 5 page 15, picture, volume 5 page 15*

MORE TO EXPLORE

glass *volume 5 page 119*

telephone *volume 13 page 36*

fibrous root

root *volume 11 page 96*

fibula (bone)

leg *volume 7 page 123*

fiction (literature)

MAIN ARTICLE *volume 5 page 17*

MORE TO EXPLORE

literature *volume 7 page 160*

field (sports)

baseball *picture, volume 2 page 31*

soccer *volume 12 page 116, picture, volume 12 page 117*

field archery (sport)

archery *volume 1 page 166*

fielder (sports)

cricket *volume 3 page 215*

field event (sports)

track and field *picture, volume 13 page 85*

field force (physics)

force *volume 5 page 50*

field glasses (magnifying device): *see in index* binoculars

field goal (sports)

football *volume 5 page 50*

Field Museum of Natural History

(museum in Chicago, Illinois, U.S.)

“Sue” *picture, volume 8 page 212*

fieldwork (research method)

archaeology *volume 1 page 163*

FIFA: *see in index* Fédération Internationale de Football Association

FIFA World Cup (soccer): *see in index* World Cup

Fifteenth Amendment (U.S. Constitution)

African Americans *volume 1 page 43*

Grant *volume 5 page 138*

Reconstruction *volume 11 page 34*

Fifth Crusade (European, Christian and Islamic history): *see in index* Crusades

fifth position (ballet)

ballet positions *picture, volume 2 page 14*

fig (tree and fruit)

MAIN ARTICLE *volume 5 page 18, picture, volume 5 page 18*

fighter aircraft

air force *volume 1 page 52*

fighting (sport): *see in index* boxing

Fighting Falcon (military aircraft): *see in index* F-16

figure skate (sports equipment)

ice skating *volume 6 page 109*

types of skates *picture, volume 6 page 109*

figure skating (sport)

ice skating *volume 6 page 109, picture, volume 6 page 110*

types of skates *picture, volume 6 page 109*

Fiji (island country in the Pacific Ocean)

MAIN ARTICLE *volume 5 page 19, picture, volume 5 page 19*

MORE TO EXPLORE

Parliament House *picture, volume 12 page 209*

filbert (nut and tree): *see in index* hazelnut

Filipino (people)

Philippines *volume 10 page 71*

filling (dentistry)

dentistry *volume 4 page 38*

Fillmore, Abigail (first lady of the U.S.)

Fillmore, Millard *volume 5 page 20*

Fillmore, Millard (president of the U.S.)

MAIN ARTICLE *volume 5 page 20, picture, volume 5 page 20*

MORE TO EXPLORE

timeline *volume 5 page 20*

film: *see in index* movie

film (photography)

developing photographs *picture, volume 10 page 76*

photography *volume 10 page 76*

film editing (movies)

movie *volume 8 page 199*

film projector (device): *see in index*

movie projector

fin (animal appendage)

fish *volume 5 page 27*

final solution (Nazi policy)

Holocaust *volume 6 page 72*

finback whale (mammal): *see in index* fin

whale

finch (bird)

MAIN ARTICLE *volume 5 page 21*

MORE TO EXPLORE

American goldfinch *picture, volume 5 page 21*

finger (anatomy)

arthritis *picture, volume 1 page 191*

hand *volume 6 page 12*

nail *picture, volume 9 page 4*

finger nail (anatomy): *see in index* nail

fingerprint (anatomy)

hand *volume 6 page 12*

police investigation *picture, volume 10 page 112*

Finland (country in Europe)

MAIN ARTICLE *volume 5 page 22*

MORE TO EXPLORE

geography

conifer forest *picture, volume 3 page 182*

Olavinlinna Castle *picture, volume 5 page 23*

Sami *picture, volume 5 page 22*

Sweden *volume 12 page 213*

Finnbogadóttir, Vigdís (president of

Iceland)

Iceland *volume 6 page 108*

fin whale (mammal)

whale species *picture, volume 15 page 37*

fir (tree)

MAIN ARTICLE *volume 5 page 24, picture, volume 5 page 24*

fire (combustion)

MAIN ARTICLE *volume 5 page 24*

MORE TO EXPLORE

cooking *picture, volume 6 page 32*

firefighting *volume 5 page 25*

fireplace *picture, volume 5 page 24*

mythology

Hephaestus *picture, volume 6 page 43*

Prometheus *volume 10 page 155*

steel mill *picture, volume 5 page 25*

Zoroastrianism *volume 15 page 110*

firearm (weapon): *see in index* gun

fire bomb (military technology): *see in index* incendiary bomb

firefighting

MAIN ARTICLE *volume 5 page 25, picture, volume 5 page 26*

MORE TO EXPLORE

World War II *picture, volume 15 page 66*

firefly (insect)

MAIN ARTICLE *volume 5 page 26, picture, volume 5 page 26*

firing (ceramics)

brick and tile *volume 2 page 128*

pottery *volume 10 page 140*

first-degree burn (injury)

burn and scald *volume 2 page 152*

First Fleet (Australian history)

Australia *volume 1 page 231*

First Nations (Canadian people): *see in index*

North American Indian

first position (ballet)

ballet positions *picture, volume 2 page 14*

First Seminole War (U.S. history, 1817-18)

Seminole *volume 12 page 64*

First State (state in the U.S.): *see in index*

Delaware

First Temple (Judaism): *see in index*

Jerusalem, Temple of

FIS (political party in Algeria): *see in index*

Islamic Salvation Front

fish (animal)

MAIN ARTICLE *volume 5 page 27*

MORE TO EXPLORE

animal *volume 1 page 125*

vertebrates *volume 14 page 72*

aquarium *volume 1 page 154*

brain *volume 2 page 122, picture, volume 2 page 122*

egg *volume 4 page 108*

four animal skeletal systems *picture, volume 12 page 95*

heart *volume 6 page 32*

images

anemone fish *picture, volume 5 page 28*

gills *picture, volume 11 page 54*

Red Sea *picture, volume 11 page 37*

whale shark *picture, volume 5 page 28*

Yellowspot emperor fish *picture, volume 5 page 27*

nest *volume 9 page 37*

nose *volume 9 page 100*

prehistoric life *volume 10 page 145*

fish eagle (bird): *see in index* sea eagle

fishing (food production)

Atlantic Ocean *volume 1 page 222*

images

Bangladesh *picture, volume 2 page 22*

Enya people *picture, volume 3 page 180*

Euphrates River *picture, volume 4 page 159*

Ghana *picture, volume 5 page 111*

Inuit *picture, volume 9 page 96*

Mekong River *picture, volume 1 page 204*

Micronesia *picture, volume 8 page 119*

Niger River *picture, volume 9 page 69*

Sri Lanka *picture, volume 12 page 174*

fishing (recreation)

rainbow trout *picture, volume 13 page 99*

fission (physics): *see in index* nuclear fission

Fitch, John (U.S. industrialist)

technology and invention *volume 13 page 27*

fittest, survival of the (biology): *see in index* survival of the fittest

Fitzroy, Mount (mountain in Argentina)

picture, volume 1 page 118

FIVB (sports organization): *see in index*

Fédération Internationale de Volleyball

Five Civilized Tribes (North American

Indian confederacy)

Cherokee *volume 3 page 88*

Chickasaw *volume 3 page 94*

Choctaw *volume 3 page 110*

Creek *volume 3 page 213*

five pillars of Islam (religion): *see in index* Islam, five pillars of

fjord (sea inlet)

Greenland *volume 5 page 158*

Norway *picture, volume 4 page 162*

flag (heraldry)

MAIN ARTICLE *volume 5 page 29*

MORE TO EXPLORE

shapes *volume 5 page 30*

ship from Venice, Italy *picture, volume 5 page 31*

United Kingdom *volume 5 page 30*

United States *volume 5 page 29*

flake tool (prehistoric technique)

Stone Age *volume 12 page 188*

flame

fire *volume 5 page 25*

flamenco (form of music and dance)

dancer *picture, volume 12 page 154*

flamingo (bird)

MAIN ARTICLE *volume 5 page 31, picture, volume 5 page 31, picture, volume 14 page 64*

flap (aircraft part)

airplane *volume 1 page 54*

flash flood

flood *volume 5 page 33*

flashlight (device)

battery *picture, volume 2 page 40*

Flathead (Native American people)

MAIN ARTICLE *volume 5 page 31*

MORE TO EXPLORE

Charlot, Flathead chief *picture, volume 5 page 32*

Native Americans *volume 9 page 18*

Flat Pipe (sacred object)

Arapaho *volume 1 page 161*

flat-plate collector (technology)

solar energy *volume 12 page 125, picture, volume 12 page 125*

flatworm (animal)

invertebrate animals *picture, volume 9 page 34*

worm *volume 15 page 71*

flax (plant and fiber)

Canadian flax crop *picture, volume 8 page 45*

flea (insect)

MAIN ARTICLE *volume 5 page 32, picture, volume 5 page 32*

MORE TO EXPLORE

insect *volume 6 page 139*

parasite *volume 10 page 33*

plague *volume 10 page 92*

typhus *volume 13 page 124*

Fleming (European people)

Belgium *volume 2 page 54*

Fleming, Alexander (Scottish bacteriologist)

penicillin *volume 10 page 53*

fleshy fruit (botany)

fruit *volume 5 page 72*

flicker (bird)

woodpecker *volume 15 page 59*

flight (aircraft): *see in index* aviation

flight (animal locomotion)

bird *volume 2 page 77*

gull *picture, volume 5 page 171*

flight control

airplane *volume 1 page 56*

flight instrument (airplane part)

airplane *volume 1 page 56*

flightless bird: *see in index* bird, flightless

flight simulator (training device): *see in index* simulator

flipper (animal anatomy)

seal *volume 12 page 59*

walrus *volume 15 page 6*

FLN (political party in Algeria): *see in index* National Liberation Front

flood

MAIN ARTICLE *volume 5 page 33, picture, volume 5 page 33*

MORE TO EXPLORE

dam *volume 4 page 9*

river *volume 11 page 68*

flood irrigation (agriculture)

irrigation *volume 6 page 161*

floor (construction)

brick and tile *volume 2 page 128*

floor exercise (gymnastics)

gymnastics *volume 5 page 174, picture, volume 5 page 175, picture, volume 5 page 176*

Florence (city in Italy) *picture, volume 6 page 173*

banking in Florence *picture, volume 2 page 26*

Medici family *volume 8 page 91*

Renaissance *volume 11 page 46*

Florida (state in the U.S.)

MAIN ARTICLE *volume 5 page 34*

MORE TO EXPLORE

geography

Florida Keys *volume 5 page 37, picture, volume 5 page 37*

Honeymoon Island *picture, volume 5 page 35*

J. F. K. Space Center

space shuttle “Discovery” *picture, volume 5 page 36*

Lake Bradford *picture, volume 13 page 12*

history

Jackson *volume 7 page 6*

Ponce de León *volume 10 page 123*

Florida Keys (island chain in Florida, U.S.)

MAIN ARTICLE *volume 5 page 37*

MORE TO EXPLORE

Florida *volume 5 page 34*

flour (food)

grain *volume 5 page 135*

wheat *volume 15 page 39*

flower

MAIN ARTICLE *volume 5 page 37*

MORE TO EXPLORE

garden *volume 5 page 87*

images

cross-pollination *picture, volume 10 page 117*

garden in The Netherlands *picture, volume 5 page 38*

Keukenhof Gardens *picture, volume 5 page 87*

parts of a flower *picture, volume 5 page 38*

reproduction *picture, volume 10 page 95*

rhododendron *picture, volume 11 page 62*

self-pollination *picture, volume 10 page 116*

flowering tree: *see in index* broad-leaved tree

flu (viral infection): *see in index* influenza

fluke (whale anatomy)
whale *volume 15 page 38*

flute (musical instrument)
wind instruments *picture, volume 8 page 217*

fly (insect)
MAIN ARTICLE *volume 5 page 39*
MORE TO EXPLORE
housefly *picture, volume 5 page 39*

flying fish
MAIN ARTICLE *volume 5 page 39, picture, volume 5 page 40*

flying lizard (reptile) *picture, volume 11 page 52*

flying shuttle (weaving)
Industrial Revolution *volume 6 page 133*

flying squirrel (rodent)
squirrel *volume 12 page 173*

flying trapeze (circus act equipment)
Barnum & Bailey poster *picture, volume 3 page 120*

fly orchid (plant and flower) *picture, volume 8 page 130*

fog (weather)
MAIN ARTICLE *volume 5 page 40, picture, volume 5 page 40*
MORE TO EXPLORE
Cumberland Gap *picture, volume 3 page 231*

Fogg, Phileas (fictional character)
Verne *volume 14 page 70*

folk dance
dance *volume 4 page 11*
Greece *picture, volume 5 page 153*
Mexico *picture, volume 3 page 118*
Ukraine *picture, volume 14 page 7*

folklore (social customs, tales, and traditions)
Easter *volume 4 page 93*

folk music
MAIN ARTICLE *volume 5 page 41, picture, volume 5 page 41*
MORE TO EXPLORE
country music *volume 3 page 208*

folk rock (music)
folk music *volume 5 page 41*

folk song
folk music *volume 5 page 41*

folktale (literature)
MAIN ARTICLE *volume 5 page 41, picture, volume 5 page 42, picture, volume 5 page 43*
MORE TO EXPLORE
Grimm brothers *volume 5 page 162*
storytelling *volume 12 page 194*

food
MAIN ARTICLE *volume 5 page 43*
MORE TO EXPLORE
energy source *picture, volume 4 page 139*
festival and holiday *volume 5 page 13*
seed *volume 12 page 63*
spices *volume 12 page 163*
USDA food guide pyramid *picture, volume 5 page 44*
vacuum packing *picture, volume 14 page 50*

Food and Drug Administration (U.S. government agency)
drug *volume 4 page 79*

food chain (ecology)
MAIN ARTICLE *volume 5 page 44, picture, volume 5 page 45*
MORE TO EXPLORE
ecosystem *volume 4 page 101*

food poisoning
MAIN ARTICLE *volume 5 page 45*

food pyramid (diet)
food and nutrition *volume 5 page 44*
USDA food guide pyramid *picture, volume 5 page 44*

food vacuole (cell part)
amoeba *volume 1 page 108*

food web (ecology)
food chain *volume 5 page 45*

foot (mollusk anatomy)
bivalve *volume 2 page 84*
mollusk *volume 8 page 157*

foot (anatomy)
MAIN ARTICLE *volume 5 page 47, picture, volume 5 page 47*
MORE TO EXPLORE
songbird *volume 12 page 132*
X-ray *picture, volume 15 page 82*

football (gridiron)
MAIN ARTICLE *volume 5 page 48, picture, volume 5 page 48*
MORE TO EXPLORE
football field *picture, volume 5 page 49*
rugby *volume 11 page 103*

football (soccer): *see in index* soccer

Football Association (British sports organization)
soccer *volume 12 page 118*

football field (sports) *picture, volume 5 page 49*
football *volume 5 page 48*

footrace (athletics)
Special Olympics *picture, volume 12 page 161*
track and field *volume 13 page 87*

Forbidden City (palace area in Beijing, China) *picture, volume 3 page 104*
Beijing *volume 2 page 50*

force (physics)
MAIN ARTICLE *volume 5 page 50, picture, volume 5 page 50*
MORE TO EXPLORE
machine *volume 8 page 7*
physics *volume 10 page 78*

Ford, Betty (first lady of the U.S.)
Ford, Gerald *volume 5 page 52*

Ford, Gerald R. (president of the U.S.)
MAIN ARTICLE *volume 5 page 51, picture, volume 5 page 52*
MORE TO EXPLORE
Nixon *volume 9 page 75*
timeline *volume 5 page 51*

Ford, Henry (U.S. industrialist)
automobile history *volume 1 page 237*
technology and invention *volume 13 page 28*

forebrain (anatomy)
brain *volume 2 page 122, picture, volume 2 page 122*

foreign aid
wheat from the United States *picture, volume 5 page 6*

foreign mission (Christianity): *see in index* missions

foreign trade: *see in index* international trade

foreleg (anatomy)leg *volume 7 page 123***Foreman, George** (U.S. boxer)Ali *volume 1 page 82***forest** (ecology)MAIN ARTICLE *volume 5 page 52, picture, volume 5 page 53*

MORE TO EXPLORE

biome *volume 2 page 74*conifer forest *picture, volume 3 page 182*deer and fawn *picture, volume 6 page 4*moss *picture, volume 8 page 190*tropical forest *picture, volume 5 page 54***forest eagle** (bird)eagles *volume 4 page 86***forest floor**rain forest *volume 11 page 24***forestry**definition *volume 5 page 54***Forest Service** (U.S. government agency)Roosevelt *volume 11 page 95***forgetting** (mental process)memory *volume 8 page 99***form** (literature)poetry *volume 10 page 106***form** (music)music *volume 8 page 213***formal education**education *volume 4 page 105***formation** (sports)soccer *volume 12 page 117***Formosa** (self-governing island in Asia):*see in index* Taiwan**Fort** (in names of forts): *see in index under the specific part of the name, for example, Des Moines, Fort except as found below***Fort-de-France** (capital city of Martinique)cathedral *picture, volume 8 page 66*Martinique *volume 8 page 65***fortification** (military science): *see in index* fortress**Fort-Lamy** (capital city of Chad): *see in index* N'Djamena**Fort Norman** (village in Northwest Territory, Canada)Northwest Territories *volume 9 page 96***fortress** (military science)Castillo de San Marcos *picture, volume 12 page 10*Krak des Chevaliers *picture, volume 12 page 224*ribat in Tunisia *picture, volume 13 page 110***Fort Ticonderoga** (fort in New York, U.S.): *see in index* Ticonderoga, Fort**Fort Victoria** (provincial capital of British Columbia, Canada): *see in index* Victoria**Forty-two-line Bible:** *see in index* Gutenberg Bible**Forum** (ancient Roman public building) ancient Rome *volume 11 page 89***forward** (soccer position) soccer *volume 12 page 117***fossa** (mammal)Madagascar *volume 8 page 9***Fossett, Steve** (U.S. aviator)balloon *volume 2 page 16***fossil**MAIN ARTICLE *volume 5 page 55, picture, volume 5 page 55*

MORE TO EXPLORE

Allosaurus *volume 1 page 86*amber *volume 1 page 92*dinosaur *volume 4 page 49*evolution *volume 4 page 170*human origins *volume 6 page 93*limestone *volume 7 page 153*mammoth and mastodon *volume 8 page 76*Neanderthal fossil skeleton *picture, volume 6 page 93*paleontology *volume 10 page 17*protozoan *picture, volume 10 page 159*pterodactyl *picture, volume 10 page 163***fossil fuel**MAIN ARTICLE *volume 5 page 55*

MORE TO EXPLORE

coal mined for fuel *picture, volume 5 page 56*energy *volume 4 page 137*global warming *volume 5 page 120*factory exhaust *picture, volume 5 page 120*petroleum *volume 10 page 68*pollution *volume 10 page 117***fossil record**evolution *volume 4 page 170***Foucault, Jean** (French scientist)pendulum *volume 10 page 52***foul** (sports)basketball *volume 2 page 35*soccer *volume 12 page 118***Four Noble Truths** (Buddhist philosophy)Buddha *volume 2 page 143*Buddhism *volume 2 page 144***Fourteenth Amendment** (U.S. Constitution)African Americans *volume 1 page 43*Reconstruction *volume 11 page 34***fourth-degree burn** (injury)burn and scald *volume 2 page 152***Fourth of July** (United States holiday): *see in index* Independence Day**fourth position** (ballet)ballet positions *picture, volume 2 page 14***Fouta Djallon** (region in Guinea)Guinea *volume 5 page 169***fowl** (birds): *see in index* bird; poultry; waterfowl**Fox** (Native American people)MAIN ARTICLE *volume 5 page 56, picture, volume 5 page 56*

MORE TO EXPLORE

Sauk *volume 12 page 46***fox** (animal)MAIN ARTICLE *volume 5 page 57, picture, volume 5 page 57***Fox, George** (English religious leader) Quakers *volume 11 page 5***Fox, Michael J.** (actor)with Muhammad Ali *picture, volume 10 page 35***Fox, Vicente** (president of Mexico) Mexico *volume 8 page 112***fraction** (mathematics)numbers and number systems *volume 9 page 106***fracture** (of bone) *picture, volume 2 page 106*bone *volume 2 page 106*

fragmentation bomb (military technology)

bomb *volume 2 page 104*

frame (mechanical structure)

motorcycle *volume 8 page 192*

Français: *see in index* French language

France (country in Europe)

MAIN ARTICLE *volume 5 page 58*

MORE TO EXPLORE

art and architecture

drama *volume 4 page 74*

gargoyle *picture, volume 5 page 89*

Louvre Pyramid *picture, volume 5 page 60*

Pont du Gard *picture, volume 2 page 131*

geography

Dinan *picture, volume 5 page 58*

English Channel *volume 4 page 141*

farm with irrigation system *picture, volume 6 page 162*

Loire River *volume 7 page 173*

Loire Valley châteaux *picture, volume 7 page 173*

Paris

Eiffel Tower *picture, volume 4 page 115*

Seine River

island *picture, volume 6 page 167*

history

abolitionist movement *volume 1 page 11*

Africa

Algeria *volume 1 page 80*

Congo *volume 2 page 128*

Dahomey *volume 4 page 6*

Djibouti *volume 4 page 60*

Gabon *volume 5 page 78, volume 7 page 143*

Guinea *volume 3 page 175, volume 5 page 169*

Madagascar *volume 1 page 134, volume 8 page 10*

Mali *volume 8 page 32*

Mauritania *volume 8 page 79, volume 9 page 100*

Morocco *volume 8 page 184*

Niger *volume 9 page 67*

Reunion *volume 11 page 57*

Senegal *volume 4 page 7, volume 12 page 67*

Togo *volume 13 page 74*

Tunisia *volume 13 page 110*

Wolof Empire *volume 15 page 55*

Americas

Adams *volume 1 page 23*

Dominica *volume 4 page 65*

exploration and settlement *volume 1 page 102, picture, volume 1 page 107*

French and Indian War *volume 5 page 66*

French Guiana *volume 5 page 67*

Grenada *volume 5 page 160*

Guadeloupe *volume 5 page 165*

Haiti *volume 6 page 9, volume 13 page 83*

Louisiana *volume 7 page 181*

Baton Rouge *volume 2 page 39*

Louisiana Purchase *volume 7 page 182*

Martinique *volume 8 page 66*

Mexico *volume 8 page 112*

Mississippi River *volume 8 page 145*

Native American people

Algonquin people *volume 1 page 81*

Choctaw people *volume 3 page 110*

Illinois *volume 6 page 115*

Iowa *volume 6 page 144*

Iroquois *volume 6 page 160*

Missouri people *volume 8 page 145*

Quapaw *volume 11 page 6*

Winnebago *volume 15 page 50*

North America *volume 9 page 83*

Statue of Liberty *volume 7 page 140*

United States *volume 14 page 29*

Verrazzano *volume 14 page 70*

War of 1812 *volume 15 page 12*

Wisconsin *volume 15 page 53*

Asia

Laos *volume 7 page 107, volume 14 page 83*

Vietnam *volume 14 page 85, volume 14 page 86*

Hanoi *volume 6 page 13*

Ho Chi Minh *volume 6 page 66*

Cold War *volume 3 page 151*

De Gaulle *volume 4 page 28*

feudalism *volume 5 page 14*

Franks *volume 5 page 61*

French Polynesia *volume 5 page 68*

Holy Roman Empire *volume 6 page 74*

Huguenots *volume 6 page 92*

Indian Ocean

Mauritius *volume 8 page 80*

Seychelles *volume 12 page 74*

timeline *volume 5 page 58*

World War I *volume 15 page 61*

World War II *volume 15 page 65*

D-Day *picture, volume 15 page 69*

people and culture

Bastille Day *picture, volume 2 page 38*

cycling *volume 3 page 234*

Mardi Gras *picture, volume 8 page 54*

metric system *volume 8 page 90*

national anthem *volume 9 page 13*

Francis II (Holy Roman emperor)

Holy Roman Empire *volume 6 page 75*

Francis Ferdinand (Austrian archduke)

assassination *volume 1 page 211*

Bosnia and Herzegovina *volume 2 page 113*

World War I *volume 15 page 61*

Franco, Francisco (ruler of Spain)

Spain *volume 12 page 156*

Spanish-American War *volume 12 page 158*

Frank (people)

MAIN ARTICLE *volume 5 page 61*

MORE TO EXPLORE

Charlemagne *volume 3 page 81*

France *volume 5 page 59*

Germany *volume 5 page 106*

Holy Roman Empire *volume 6 page 74*

stone carving *picture, volume 5 page 61*

Frank, Anne (German diarist)

MAIN ARTICLE *volume 5 page 61, picture, volume 5 page 62*

MORE TO EXPLORE

Holocaust *volume 6 page 71*

Frankfort (state capital of Kentucky, U.S.)

MAIN ARTICLE *volume 5 page 62*

MORE TO EXPLORE

Kentucky *volume 7 page 56*

State Capitol *picture, volume 5 page 63*

frankincense (gum resin)

Yemen *volume 15 page 91*

Franklin, Benjamin (U.S. author, scientist, and statesman)

MAIN ARTICLE *volume 5 page 63, picture, volume 5 page 63*

MORE TO EXPLORE

education *volume 4 page 107*

“Join, or Die” cartoon *picture, volume 1 page 67*

kite *volume 7 page 72*

Paine *volume 10 page 7*

- Philadelphia *volume 10 page 70*
 Pulaski *volume 10 page 166*
- Franklin, Sir John** (English explorer)
 Northwest Passage *volume 9 page 94*
- Fraser River** (river in British Columbia, Canada)
 British Columbia *volume 2 page 133*
- fraternal twin**
 genetics *volume 5 page 94*
- Frederick I Barbarossa** (Holy Roman emperor)
 Holy Roman Empire *volume 6 page 75*
- Frederick II** (Holy Roman emperor)
 Crusades *volume 3 page 224*
- Frederick II** (king of Prussia): *see in index*
 Frederick the Great
- Frederick III** (Holy Roman emperor)
 Hapsburgs *volume 6 page 15*
- Frederick the Great** (king of Prussia)
 MAIN ARTICLE *volume 5 page 64, picture, volume 5 page 64*
 MORE TO EXPLORE
 Prussia *volume 10 page 161*
- Frederick William** (elector of Brandenburg)
 Prussia *volume 10 page 161*
- Frederick William I** (king of Prussia)
 Frederick the Great *volume 5 page 64*
- Frederick William IV** (king of Prussia)
 Prussia *volume 10 page 161*
- Fredericton** (provincial capital of New Brunswick, Canada)
 New Brunswick *volume 9 page 42*
- freedom of religion**
 bill of rights *volume 2 page 70*
- freedom of speech**
 bill of rights *volume 2 page 70*
- freedom of the press** (law)
 newspaper *volume 9 page 55*
- Free French** (French history)
 De Gaulle *volume 4 page 28*
 France *volume 5 page 60*
 World War II *volume 15 page 66*
- free kick** (sports)
 soccer *volume 12 page 118*
- free-market economy** (economic system): *see in index* capitalism
- freestyle** (swimming)
 swimming *volume 12 page 215*
- freestyle skiing** (winter sport)
 skiing *volume 12 page 99*
 skiing courses *picture, volume 12 page 99*
- freestyle wrestling** (sport)
 wrestling *volume 15 page 73*
- free throw** (sports)
 basketball *volume 2 page 35, picture, volume 2 page 34*
- Freetown** (capital city of Sierra Leone)
 MAIN ARTICLE *volume 5 page 65*
 MORE TO EXPLORE
 Sierra Leone *volume 12 page 85*
- free trade** (economics)
 trade *volume 13 page 88*
- free verse** (poetry)
 literature *volume 7 page 162*
 poetry *volume 10 page 106*
- freeway** (road): *see in index* expressway
- freezing** (phase change)
 crystal *volume 3 page 226*
 water *volume 15 page 23*
- freight car** (railroad)
 railroad *volume 11 page 20*
- freight train** (railroad): *see in index*
 freight car
- Frelimo** (political party in Mozambique):
see in index Front for the Liberation of Mozambique
- Fremont** (city in California, U.S.)
 California missions *table, volume 8 page 140*
- Frémont, John Charles** (U.S. explorer and military officer)
 MAIN ARTICLE *volume 5 page 65, picture, volume 5 page 65*
 MORE TO EXPLORE
 Carson *volume 3 page 45*
- French Alps** (mountains in France)
 France *volume 5 page 58*
- French and Indian War** (North American history)
 MAIN ARTICLE *volume 5 page 66, picture, volume 5 page 66*
 MORE TO EXPLORE
 Canada *volume 3 page 25*
- colonization *volume 1 page 107*
 Onondaga *volume 9 page 138*
 Quebec *volume 11 page 9*
- French Canadian** (people)
 Quebec *volume 11 page 9*
- French Guiana** (department of France)
 MAIN ARTICLE *volume 5 page 67, picture, volume 5 page 67*
- French Indochina** (region in Southeast Asia)
 Cambodia *volume 3 page 18*
 Vietnam *volume 14 page 85*
- French Indochina War** (Franco-Vietnamese history, 1946-54)
 Vietnam War *volume 14 page 86*
- French language**
 North America *volume 9 page 81*
- French marigold** (plant) *picture, volume 8 page 56*
 marigold *volume 8 page 56*
- French Polynesia** (French overseas island country in the Pacific Ocean)
 MAIN ARTICLE *volume 5 page 68, picture, volume 5 page 68, picture, volume 9 page 119*
- French Revolution** (French history, 1789-99)
 MAIN ARTICLE *volume 5 page 69*
 MORE TO EXPLORE
 Bastille Day *volume 2 page 38*
 bill of rights *volume 2 page 70*
 civil rights *volume 3 page 128*
 Enlightenment *volume 4 page 142*
 Europe *volume 4 page 164*
 France *volume 5 page 60*
 Paris *volume 10 page 35*
 people
 Lafayette *volume 7 page 101*
 Louis XVI *volume 7 page 179*
 Marie Antoinette *volume 8 page 55*
 Robespierre *picture, volume 5 page 70*
 protests *picture, volume 5 page 69*
 taxation *volume 13 page 22*
 terrorism *volume 13 page 49*
- French Sign Language** (form of communication)
 sign language *volume 12 page 87*
- French West Africa** (historical colonies in Africa)
 Dakar *volume 4 page 7*
 Senegal *volume 12 page 67*

frequency (physics)radio *volume 11 page 19***freshwater**lake *volume 7 page 102*natural resources *picture, volume 9 page 21***freshwater eel** (fish)eel *volume 4 page 107***Friends, Society of** (religious group): *see in index* Quakers**friendship**child development *volume 3 page 97***frilled lizard** (reptile) *picture, volume 7 page 170***Frissell, Mount** (mountain in Connecticut, U.S.)Connecticut *volume 3 page 184***Frobisher, Martin** (English sailor and explorer)Northwest Territories *volume 9 page 96*Nunavut *volume 9 page 109***Frobisher Bay** (city in Nunavut, Canada): *see in index* Iqaluit**frog** (hoof anatomy)hoof *volume 6 page 80***frog** (amphibian)MAIN ARTICLE *volume 5 page 71*

MORE TO EXPLORE

amphibian *volume 1 page 110*

images

bullfrog *picture, volume 5 page 71*green tree frog *picture, volume 1 page 110*leg *picture, volume 7 page 123*prey of screech owl *picture, volume 2 page 80*red-eyed tree frog *picture, volume 5 page 71*tree frog in the rain *picture, volume 11 page 21*urinary systems of humans and frogs *picture, volume 14 page 41*nest *volume 9 page 37***“From the Mixed-Up Files of Mrs. Basil E. Frankweiler”** (book by Konigsburg)
Konigsburg *volume 7 page 76***frond** (leaf)ferns *volume 5 page 11*palm *volume 10 page 20***front crawl stroke** (swimming): *see in index* freestyle**Front for the Liberation of Mozambique** (political party in Mozambique)
Mozambique *volume 8 page 200***frontier life** (U.S. history): *see in index* pioneer life**fruit** (food)MAIN ARTICLE *volume 5 page 72, picture, volume 5 page 72*

MORE TO EXPLORE

Angolan woman carrying fruit *picture, volume 7 page 183*Michigan *volume 8 page 117*New Jersey *volume 9 page 50*vegetable *volume 14 page 61***fruit bat** (mammal)wing *picture, volume 1 page 182***Frunze** (capital city of Kyrgyzstan): *see in index* Bishkek**fuchsia** (plant and flower)MAIN ARTICLE *volume 5 page 72, picture, volume 5 page 72***fuel** (technology)fire *volume 5 page 25*firefighting *volume 5 page 25*internal combustion *volume 6 page 140*rockets *picture, volume 11 page 77***Fugitive Slave acts** (U.S. legislation, 1793 and 1850)MAIN ARTICLE *volume 5 page 73, picture, volume 5 page 73*

MORE TO EXPLORE

Fillmore *volume 5 page 21*Underground Railroad *volume 14 page 9***Fuji, Mount** (mountain in Japan)MAIN ARTICLE *volume 5 page 74, picture, volume 5 page 74*

MORE TO EXPLORE

Japan *volume 7 page 12*volcano *volume 14 page 101***Fuji-Hakone-Izu National Park** (park in Japan)national parks *volume 9 page 15***Fujimori, Alberto** (president of Peru)Peru *volume 10 page 65***Fujinomiya** (city in Japan)Mount Fuji *volume 5 page 74***Fujiyama** (mountain in Japan): *see in index* Fuji, Mount**Fulani** (people)Guinea *volume 5 page 169*Nigeria *volume 9 page 68***Fulton, Robert** (U.S. inventor)submarine *volume 12 page 197***fumarole** (geology)volcano *volume 14 page 101***Funafuti Atoll** (islands in Tuvalu)MAIN ARTICLE *volume 5 page 75*

MORE TO EXPLORE

Tuvalu *volume 13 page 121*traditional hut *picture, volume 13 page 121***Fundamental Orders of Connecticut**

(laws of Connecticut colony, 1638)

Connecticut *volume 3 page 184***Fundy, Bay of** (bay in New Brunswick, Canada)Cape Enrage Lighthouse *picture, volume 9 page 42***funerary art**sculpture *volume 12 page 56***fungus** (organism)MAIN ARTICLE *volume 5 page 75, picture, volume 5 page 75*

MORE TO EXPLORE

classification *picture, volume 7 page 168*human disease *volume 4 page 56*lichen *volume 7 page 146*living thing *volume 7 page 169*parasite *volume 10 page 33*species on earth *picture, volume 7 page 167***fur** (animal hair and skin)explorer in fur clothing *picture, volume 10 page 48*fur trade *volume 5 page 76*mink *volume 8 page 134*musk-ox *volume 8 page 218*muskrat *volume 8 page 218***furrow** (agriculture)irrigation *volume 6 page 161, picture, volume 6 page 161***fur trade** (industry)MAIN ARTICLE *volume 5 page 76*

MORE TO EXPLORE

French America *volume 1 page 105*

Hudson's Bay Company *volume 6*
page 90
 trading post *picture, volume 5* *page 76*
 Yukon *volume 15* *page 98*

fuse (ignition device)
 bomb *volume 2* *page 104*

fuselage (aircraft structure)
 airplane *volume 1* *page 54*

fusion (nuclear): *see in index* nuclear
 fusion

fusion music
 jazz *volume 7* *page 16*



g (unit of measure): *see in index* gram

Gabon (country in Africa)
 MAIN ARTICLE *volume 5* *page 78, picture,*
volume 5 *page 78*

Gaborone (capital city of Botswana)
 MAIN ARTICLE *volume 5* *page 79*
 MORE TO EXPLORE
 Botswana *volume 2* *page 116*
 diamonds *picture, volume 5* *page 79*

Gadsden, James (U.S. politician and
 businessman)
 Gadsden Purchase *volume 5* *page 79*

Gadsden Purchase (U.S. and Mexican
 history)
 MAIN ARTICLE *volume 5* *page 79, picture,*
volume 5 *page 80*
 MORE TO EXPLORE
 Pierce *volume 10* *page 81*

Gaea (Greek mythology)
 Titans *volume 13* *page 70*

Gagarin, Yury (Soviet cosmonaut)
 exploration *volume 4* *page 174*
 space exploration *volume 12* *page 151*

gag panel (humor)
 cartoon *volume 3* *page 50*

gait (animal locomotion)
 horse *volume 6* *page 86*

Galápagos Islands (islands in the Pacific
 Ocean and Ecuador)
 MAIN ARTICLE *volume 5* *page 80*
 MORE TO EXPLORE
 Ecuador *volume 4* *page 102*
 Isabela Island *picture, volume 5* *page 81*

Galápagos penguin (bird)
 penguin *volume 10* *page 52*

Galápagos tortoise
 Galápagos Islands *volume 5* *page 80*

galaxy (astronomy)
 MAIN ARTICLE *volume 5* *page 81, picture,*
volume 12 *page 179*
 MORE TO EXPLORE

black hole *volume 2* *page 88*
 radiation *volume 11* *page 18*
 Small Magellanic Cloud *picture, vol-*
ume 14 *page 37*
 universe *volume 14* *page 37*
 Whirlpool Galaxy *picture, volume 5*
page 81

Galen of Pergamum (Greco-Roman phy-
 sician)
 anatomy *volume 1* *page 115*
 medicine *volume 8* *page 93*

Galileo (Italian philosopher, astronomer
 and mathematician)
 MAIN ARTICLE *volume 5* *page 82, picture,*
volume 5 *page 82*
 MORE TO EXPLORE

Inquisition *volume 6* *page 137*
 pendulum *volume 10* *page 52*
 telescope *volume 13* *page 39*

Galileo (United States space probe)
 Jupiter *volume 7* *page 41*

Gallaudet, Thomas Hopkins (U.S. edu-
 cator)
 sign language *volume 12* *page 87*

gallbladder (anatomy)
 human digestive system *picture, vol-*
ume 4 *page 47*
 proximity to liver *picture, volume 7*
page 167

galleon (sailing vessel)
 ship *volume 12* *page 83*

Gallipoli Peninsula (peninsula in Tur-
 key)
 Dardanelles *volume 4* *page 16*

gallop (animal locomotion)
 horse *volume 6* *page 86*

Gama, Vasco da (Portuguese navigator)
 MAIN ARTICLE *volume 5* *page 83, picture,*
volume 5 *page 83*
 MORE TO EXPLORE
 Dias *volume 4* *page 45*
 Portugal *volume 10* *page 134*

Gambia, The (country in Africa)
 MAIN ARTICLE *volume 5* *page 84*
 MORE TO EXPLORE
 images
 musician *picture, volume 8* *page 214*
 peanut warehouse *picture, volume 2*
page 23
 Senegal *volume 12* *page 67*

Gambia River (river in western Africa)
 Gambia *volume 5* *page 84*

gambling
 Nevada *volume 9* *page 41*

game (recreation)
 toy *volume 13* *page 83*

gamete (biology)
 chromosome *volume 3* *page 116*
 genetics *volume 5* *page 93*

Gamla Stan (district in Stockholm, Swe-
 den) *picture, volume 12* *page 213*

gamma ray (physics)
 radiation *volume 11* *page 17*
 types of electromagnetic radiation
picture, volume 11 *page 18*

Gandhi, Indira (prime minister of India)
 MAIN ARTICLE *volume 5* *page 85, picture,*
volume 5 *page 85*
 MORE TO EXPLORE
 with son *picture, volume 1* *page 211*

Gandhi, Mahatma (Indian leader)
 MAIN ARTICLE *volume 5* *page 85, picture,*
volume 5 *page 86*
 MORE TO EXPLORE
 caste *volume 3* *page 52*
 Hinduism *volume 6* *page 57*
 India *volume 6* *page 125*
 Nehru *volume 9* *page 30*

Gandhi, Rajiv (prime minister of India)
 with mother *picture, volume 1* *page 211*

Ganges River (river in Asia)
 MAIN ARTICLE *volume 5* *page 86*
 MORE TO EXPLORE
 Hinduism *volume 6* *page 57*
 pilgrimage *volume 10* *page 85*
 India *volume 6* *page 123*

gangsta rap (hip-hop music)

rap *volume 11 page 27*

Ganymede (moon of Jupiter)

Jupiter *volume 7 page 41*

Gao (city in Mali)

Songhai empire *volume 12 page 133*

garden (cultivated area of plants)

MAIN ARTICLE *volume 5 page 87, picture, volume 5 page 87*

MORE TO EXPLORE

Keukenhof Gardens *picture, volume 5 page 87*

Riyadh *picture, volume 11 page 69*

garden asparagus (vegetable)

asparagus plants *volume 1 page 209*

garden beet (plant)

beet *volume 2 page 46*

garden eel (fish)

eel *volume 4 page 108*

Garden State (state in the U.S.): *see in index* New Jersey

Garfield, James A. (president of the U.S.)

MAIN ARTICLE *volume 5 page 88, picture, volume 5 page 88*

MORE TO EXPLORE

assassination *volume 1 page 211*

timeline *volume 5 page 88*

gargoyle (architecture)

MAIN ARTICLE *volume 5 page 89, picture, volume 5 page 89*

Garifuna (people)

Carib *volume 3 page 41*

garlic (plant and food)

MAIN ARTICLE *volume 5 page 90, picture, volume 5 page 90*

garment (body covering): *see in index* clothing

Garrick, David (English actor, poet and producer)

theater *volume 13 page 59*

Garrison, William Lloyd (U.S. editor, writer, and abolitionist) *picture, volume 1 page 12*

abolitionist movement *volume 1 page 12*

Garrison Dam (dam in North Dakota, U.S.)

North Dakota *volume 9 page 88*

Garvey, Marcus (Jamaican leader)

MAIN ARTICLE *volume 5 page 90, picture, volume 5 page 91*

gas (state of matter)

evaporation and condensation *volume 4 page 166*

matter *volume 8 page 78, picture, volume 8 page 78*

gas, natural: *see in index* natural gas

gas giant (astronomy)

Jupiter *volume 7 page 41*

Neptune *volume 9 page 33*

planets *volume 10 page 92, picture, volume 10 page 93*

Uranus *volume 14 page 39*

gasoline (fuel)

automobile *volume 1 page 237*

petroleum *volume 10 page 68*

gasoline engine

motorcycle *volume 8 page 192*

technology and invention *volume 13 page 27*

Gaspra (asteroid) *picture, volume 1 page 213*

gastric juice (biochemistry)

stomach *volume 12 page 188*

gastriole (cell part): *see in index* food vacuole

gastropod (class of mollusks): *see in index* slug; snail

Gates, Horatio (U.S. general)

American Revolution *volume 1 page 101*

Gateway Arch (monument in St. Louis, Missouri, U.S.) *picture, volume 8 page 146*

Gateway of India (monument arch in Mumbai, India) *picture, volume 8 page 204*

gaucho (South American cowboy)

cattle herding *picture, volume 3 page 61, picture, volume 14 page 42*

Gaudí, Antoni (Spanish architect)

church of the Holy Family *picture, volume 12 page 154*

Gauguin, Paul (French painter)

painting *volume 10 page 11*

Van Gogh *volume 14 page 56*

Gaul (people)

ancient Rome *volume 11 page 89*

France *volume 5 page 59*

Gaul (ancient region in Europe)

Caesar *volume 3 page 8*

Franks *volume 5 page 61*

Gaza Strip (territory in the Middle East)

Arab-Israeli Wars *volume 1 page 159*

Palestine *volume 10 page 19*

gazelle (mammal)

antelope *volume 1 page 138*

gear (mechanics)

clock *volume 3 page 140*

machine *volume 8 page 7*

Geb (Egyptian god)

Re *volume 11 page 31*

gecko (reptile)

MAIN ARTICLE *volume 5 page 92, picture, volume 5 page 92*

MORE TO EXPLORE

eye *picture, volume 4 page 176*

lizard *volume 7 page 169*

Gehry, Frank (U.S. architect)

architecture *volume 1 page 172*

Chicago's Millennium Park *picture, volume 3 page 92*

MARTa museum *picture, volume 1 page 172*

Geisel, Theodor Seuss (U.S. author and illustrator): *see in index* Seuss, Dr.

gekko (reptile): *see in index* gecko

gem (mineral): *see in index* gemstone

Gemara (Jewish commentaries)

Talmud *volume 13 page 14*

Gemini (astronomy)

constellations *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

Gem State (state in the U.S.): *see in index* Idaho

gemstone (mineral)

MAIN ARTICLE *volume 7 page 23*

MORE TO EXPLORE

crown of Queen Victoria *picture, volume 7 page 24*

crystal *volume 3 page 226*

naturally formed pearls in mollusk

shells *picture, volume 7 page 24*

gene (biological heredity)cell *volume 3 page 67*DNA *volume 4 page 60*evolution *volume 4 page 170*genes and eye color *picture, volume 5 page 94*genetics *volume 5 page 93***general** (military rank)army *volume 1 page 189***General Assembly** (United Nations)United Nations *volume 14 page 22***general hospital** (medical facility)hospital *volume 6 page 88***general-purpose bomb** (military technology)bomb *volume 2 page 104***generator** (machine)electricity *volume 4 page 121***Genesis** (Old Testament)Abraham *volume 1 page 13***genetic disease**human disease *volume 4 page 57*mutation *volume 8 page 220***genetic engineering**genetics *volume 5 page 95***genetics** (science)MAIN ARTICLE *volume 5 page 93*

MORE TO EXPLORE

anthropology *volume 1 page 141*gender determination *picture, volume 5 page 93*genes and eye color *picture, volume 5 page 94*mutation *volume 8 page 220***Geneva Convention**war *volume 15 page 10***Genghis Khan** (Mongolian emperor)MAIN ARTICLE *volume 5 page 95, picture, volume 5 page 95*

MORE TO EXPLORE

Mongol Empire *volume 8 page 161*Mongolia *volume 8 page 164***“Genji monogatari”** (work byMurasaki): *see in index* “Tale of Genji, The”**Genoa** (city in Italy)portolan map, *volume 3 page 126***geochronology** (Earth science)dinosaur *picture, volume 4 page 53***geography** (science)MAIN ARTICLE *volume 5 page 96*

MORE TO EXPLORE

globe *picture, volume 8 page 49*map *picture, volume 5 page 96***geologic time**dinosaur *volume 4 page 49***geologist**geology *volume 5 page 97***geology** (science)MAIN ARTICLE *volume 5 page 97, picture, volume 5 page 97*

MORE TO EXPLORE

Earth *volume 4 page 90*volcano *volume 14 page 101***geometry** (mathematics)MAIN ARTICLE *volume 5 page 98*

MORE TO EXPLORE

mathematics *volume 8 page 77***George II** (king of Great Britain)Georgia *volume 5 page 101***George III** (king of Great Britain)MAIN ARTICLE *volume 5 page 99, picture, volume 5 page 100*

MORE TO EXPLORE

Declaration of Independence *volume 4 page 24***George VI** (king of the United Kingdom)Elizabeth II *volume 4 page 126***Georgetown** (capital city of Guyana)MAIN ARTICLE *volume 5 page 100*

MORE TO EXPLORE

Guyana *volume 5 page 173***George Tupou I** (king of Tonga)Nuku'alofa *volume 9 page 105***Georgia, Republic of** (country in southwestern Asia)MAIN ARTICLE *volume 5 page 103*

MORE TO EXPLORE

Tbilisi *picture, volume 13 page 24***Georgia** (state in the U.S.)MAIN ARTICLE *volume 5 page 101*

MORE TO EXPLORE

geography

Centennial Olympic Park *picture, volume 1 page 219*Savannah oaks *picture, volume 5 page 102*Stone Mountain Park carvings *picture, volume 5 page 102*

history

Carter *volume 3 page 46*Jackson *volume 7 page 6***Georgian Bay** (bay in Lake Huron, Ontario, Canada)Lake Huron *volume 6 page 103***geranium** (plant and flower)MAIN ARTICLE *volume 5 page 104, picture, volume 5 page 104***gerbil** (rodent)MAIN ARTICLE *volume 5 page 104, picture, volume 5 page 104*

MORE TO EXPLORE

rodent *volume 11 page 80***gerenuk** (mammal)antelope types *picture, volume 1 page 139***germ** (grain seed)grain *volume 5 page 134***germ** (organism that causes disease)food poisoning *volume 5**page 46*Pasteur *volume 10 page 40***German Empire** (historic country in Europe)Germany *volume 5 page 106***Germanic languages**Europe *volume 4 page 162*language *volume 7 page 105***Germanic mythology** (legends and stories of Northern Europe): *see in index* Norse mythology**Germanic peoples:** *see in index* Alemanni; Anglo-Saxon; Frank; Lombard; Saxon; Walloon**Germanic religion and mythology** (legends and stories of Northern Europe): *see in index* Norse mythology**German measles** (disease): *see in index* rubella**German Republic** (German history): *see in index* Weimar Republic**German shepherd** (breed of dog)herding dogs *table, volume 4 page 62***German Workers' Party** (political party in Germany): *see in index* Nazi Party**Germany** (country in Europe)MAIN ARTICLE *volume 5 page 105*

For more about geography, look for these articles:

<u>BIOMES</u>	Tierra del Fuego	Himalayas	North Sea	Jordan River
Biome	West Indies	Karakoram Range	Ocean	Loire River
Desert		Kilimanjaro, Mount	Ontario, Lake	Mekong River
Forest	<u>LANDMARKS</u>	McKinley, Mount	Pacific Ocean	Mississippi River
Grassland	Eiffel Tower	Mountain	Red Sea	Missouri River
Rain Forest	Great Barrier Reef	Olympus, Mount	Superior, Lake	Nile River
Taiga	Great Wall of China	Pyrenees	Tanganyika, Lake	Ohio River
Tundra	Kremlin	Rocky Mountains	Tide	River
	Liberty, Statue of	Sierra Nevada	Victoria, Lake	Saint Lawrence River
<u>DESERTS</u>	National Parks	Ural Mountains		and Seaway
Gobi	Stonehenge	Valley	<u>REGIONS</u>	Sault Sainte Marie
Great Victoria Desert	Taj Mahal	Vesuvius, Mount	Arabian Peninsula	Canals
Kalahari Desert		Virunga Mountains	Asia Minor	Suez Canal
Sahara	<u>MAPPING</u>	Volcano	Balkan Peninsula	Thames River
	Atlas		Continent	Tigris River
<u>EARTH MOVEMENTS</u>	Equator	<u>OCEANS, SEAS, AND</u>	Crimea	Volga River
Avalanche	Hemisphere	<u>LAKES</u>	Fertile Crescent	Waterfall
Earthquake	Latitude and	Adriatic Sea	Gibraltar	Yellow River
Glacier	Longitude	Aegean Sea	Middle East	Yangtze River
Iceberg	Map and Globe	Aral Sea	Palestine	Yukon River
Plate Tectonics		Arctic Ocean	Tibet	
Ring of Fire	<u>MOUNTAINS AND</u>	Atlantic Ocean	Tropics	<u>WEATHER</u>
	<u>OTHER LANDFORMS</u>	Baltic Sea	Yucatán Peninsula	Climate
<u>ISLANDS</u>	Alps, The	Bering Sea		Cloud
Bermuda	Allegheny Mountains	Black Sea	<u>RIVERS AND OTHER</u>	Drought
East Indies	Andes Mountains	Caribbean Sea	<u>WATERWAYS</u>	Seasons
Falkland Islands	Appalachian	Caspian Sea	Amazon River	Weather
Florida Keys	Mountains	Dead Sea	Canal	
French Polynesia	Black Hills	Erie, Lake	Colorado River	<u>WETLANDS</u>
Galápagos Islands	Blue Ridge	Great Lakes	Columbia River	Bog
Greenland	Mountains	Harbor	Dardanelles	Everglades
Guam	Canyon	Hudson Bay	Delta	Marsh
Island	Cave	Huron, Lake	English Channel	Okefenokee Swamp
Oceania	Death Valley	Indian Ocean	Erie Canal	Swamp
Puerto Rico	Etna, Mount	Lake	Euphrates River	Wetland
Réunion	Everest, Mount	Mediterranean Sea	Ganges River	
Samoa	Fuji, Mount	Mexico, Gulf of	Huang He	
Tasmania	Grand Canyon	Michigan, Lake	Indus River	

MORE TO EXPLORE

Black Forest farm *picture*, *volume 5*
page 105
 decorative arts *volume 4* *page 25*
 history
 colonialism
 Dar es Salaam *volume 4* *page 16*
 Lomé *volume 7* *page 174*
 Namibia *volume 9* *page 7*
 Nauru *volume 9* *page 22*
 Samoa *volume 12* *page 24*
 Tanzania *volume 13* *page 16*
 Europe *volume 4* *page 164*
 Holy Roman Empire *volume 6*
page 74

Italy *volume 6* *page 174*
 Lithuania *volume 7* *page 165*
 Netherlands *volume 9* *page 39*
 Norway *volume 9* *page 98*
 Poland *volume 10* *page 109*
 Prussia *volume 10* *page 161*
 Soviet Union *volume 14* *page 13*
 Ukraine *volume 7* *page 64*, *volume 14* *page 7*
 Vilnius *volume 14* *page 91*
 Warsaw *volume 15* *page 14*
 Nazism
 Hitler *volume 6* *page 64*
 Holocaust *volume 6* *page 71*
 Nazi Party *volume 9* *page 26*

timeline *volume 5* *page 105*
 Wilson *volume 15* *page 47*
 World War I *volume 15* *page 61*
 “Lusitania” *volume 7* *page 185*
 World War II *volume 15* *page 65*
 refugees crossing wrecked bridge
 picture, *volume 11* *page 41*
 people and culture
 national anthem *volume 9* *page 13*
 outdoor restaurant in Munich *picture*,
 volume 5 *page 106*
Germany, East (historical subdivision of
 Germany)
 Berlin *volume 2* *page 62*

- Germany *volume 5 page 107*
- Germany, West** (historical subdivision of Germany)
 Berlin *volume 2 page 62*
 Germany *volume 5 page 107*
- germination** (botany)
 seed *volume 12 page 62*
- Geronimo** (Apache leader)
 MAIN ARTICLE *volume 5 page 108, picture, volume 5 page 108*
 MORE TO EXPLORE
 Apache *volume 1 page 144*
- gestation** (reproduction)
 MAIN ARTICLE *volume 5 page 108, picture, volume 5 page 109*
 MORE TO EXPLORE
 mammals *volume 8 page 37*
- Gettysburg, Battle of** (American Civil War, 1863)
 American Civil War *volume 1 page 97*
 Gettysburg National Military Park *picture, volume 10 page 57*
 Lee *volume 7 page 122*
- Gettysburg Address** (work by Lincoln)
 Lincoln *volume 7 page 156*
- Gettysburg National Military Park** (national park in Gettysburg, Pennsylvania, U.S.) *picture, volume 10 page 57*
- geyser** (geology)
 volcano *volume 14 page 101*
- Ghana** (country in West Africa)
 MAIN ARTICLE *volume 5 page 110, picture, volume 5 page 110, picture, volume 5 page 111*
 MORE TO EXPLORE
 Ashanti *volume 1 page 197*
 medical researchers working in a laboratory *picture, volume 12 page 49*
- Ghana Empire** (historical empire in West Africa)
 MAIN ARTICLE *volume 5 page 112*
- Ghirlandajo, Domenico** (Italian painter)
 Michelangelo *volume 8 page 115*
- Ghost Dance** (North American Indian cult)
 Wounded Knee *volume 15 page 72*
- giant anaconda** (reptile) *picture, volume 1 page 113*
 anacondas *volume 1 page 113*
- giant anteater** (mammal) *picture, volume 1 page 138*
- giant panda** (mammal)
 pandas *volume 10 page 25*
- Giant's Causeway** (rock formation in Northern Ireland, United Kingdom)
picture, volume 9 page 89
- Giants** (U.S. baseball team): *see in index*
 San Francisco Giants
- giant sea bass** (fish)
 bass *volume 2 page 37*
- giant sequoia** (tree)
 MAIN ARTICLE *volume 5 page 112, picture, volume 5 page 113*
 MORE TO EXPLORE
 conifer *volume 3 page 182, picture, volume 3 page 183*
 Sequoia *volume 12 page 70*
 Sierra Nevada *volume 12 page 86*
- giant slalom** (ski race)
 Alpine skiing courses *picture, volume 12 page 98*
 skiing *volume 12 page 99*
- giant squid** (mollusk)
 legendary animals *volume 1 page 128*
 squid *volume 12 page 172*
- giant squirrel of Asia** (rodent)
 squirrel *volume 12 page 173*
- giant tortoise** (reptile)
 Isabela Island *picture, volume 5 page 81*
- Gibbet Island** (island in New York, U.S.): *see in index* Ellis Island
- gibbon** (primate)
 MAIN ARTICLE *volume 5 page 113, picture, volume 5 page 113*
 MORE TO EXPLORE
 apes *volume 1 page 146*
- Gibraltar** (British crown colony and peninsula)
 MAIN ARTICLE *volume 5 page 114*
- Gibraltar, Strait of** (channel)
 Gibraltar *volume 5 page 114*
 Mediterranean Sea *volume 8 page 94*
- Gila monster** (reptile) *picture, volume 7 page 170*
 lizard *volume 7 page 170*
- gill** (respiratory system)
 amphibians *volume 1 page 111*
- bivalve *volume 2 page 84*
 fish *volume 5 page 27, picture, volume 11 page 54*
- gilt** (mammal)
 pig *volume 10 page 83*
- ginkgo** (tree)
 MAIN ARTICLE *volume 5 page 115, picture, volume 5 page 115*
- ginseng** (herb)
 herb *volume 6 page 45*
- Ginza** (district in Tokyo, Japan)
 Tokyo *volume 13 page 76*
- giraffe** (mammal)
 MAIN ARTICLE *volume 5 page 115, picture, volume 5 page 116*
 MORE TO EXPLORE
 Mount Kilimanjaro *picture, volume 1 page 38*
- girder bridge** (transportation structure): *see in index* beam bridge
- Girl Scouts** (youth organization)
 Arbor Day *picture, volume 1 page 162*
 Indonesian Girl Scouts *picture, volume 12 page 54*
 scouting *volume 12 page 54*
- Girl Scouts of the U.S.A.** (U.S. youth organization)
 scouting *volume 12 page 54*
- "Giving Tree, The"** (book by Silverstein)
 Silverstein *volume 12 page 90, picture, volume 12 page 90*
- Giza, Pyramids of** (pyramids in Egypt): *see in index* Pyramids of Giza
- gizzard** (animal anatomy)
 bird *volume 2 page 77*
- glacial process** (geomorphology): *see in index* glaciation
- glacial till** (geology)
 cross section of soil and glacial till *picture, volume 12 page 124*
- glaciation** (geomorphology)
 bog *volume 2 page 99*
- glacier** (ice sheet)
 MAIN ARTICLE *volume 5 page 116, picture, volume 5 page 116*
 MORE TO EXPLORE
 Alaska *picture, volume 1 page 64*

- erosion *volume 4 page 152, picture, volume 4 page 152*
- Greenland *volume 5 page 157*
- ice age *volume 6 page 106*
- iceberg *volume 6 page 107*
- lake *volume 7 page 102*
- Patagonia *picture, volume 1 page 175*
- valley *volume 14 page 53*
- Glacier National Park** (national park in Montana, U.S.)
 Bearhat Mountain and Hidden Lake *picture, volume 8 page 174*
- gladiator** (Roman sports)
 MAIN ARTICLE *volume 5 page 117, picture, volume 5 page 117*
 MORE TO EXPLORE
 boxing *volume 2 page 119*
- gland** (biology)
 endocrine system *volume 4 page 134, picture, volume 4 page 135*
- gland system** (anatomy and physiology): *see in index* endocrine system
- glandular fever** (disease): *see in index* mononucleosis
- Glasgow** (city in Scotland, United Kingdom)
 Scottish Exhibition and Conference Centre *picture, volume 14 page 17*
- glasnost** (Soviet government policy)
 Cold War *volume 3 page 151*
- glass**
 MAIN ARTICLE *volume 5 page 118, picture, volume 5 page 118, picture, volume 5 page 119*
 MORE TO EXPLORE
 crystal *volume 3 page 226*
 glassware *picture, volume 15 page 35*
- glassblowing** *picture, volume 5 page 119*
 glass *volume 5 page 118*
 Phoenicians *volume 10 page 74*
 Tiffany vase *picture, volume 4 page 25*
- glasses** (optical aid): *see in index* eyeglasses
- glaucoma** (disease)
 blindness *volume 2 page 90*
- glaze** (ceramics)
 brick and tile *volume 2 page 129*
 pottery *volume 10 page 139*
- Glenn, John H., Jr.** (U.S. astronaut)
 space exploration *volume 12 page 151*
- glider** (aircraft)
 MAIN ARTICLE *volume 5 page 119, picture, volume 5 page 119*
 MORE TO EXPLORE
 airplane *volume 1 page 57*
 Wright brothers *volume 15 page 75*
- gliding** (animal locomotion)
 flying fish *volume 5 page 39*
- global positioning system** (navigation)
 navigation *volume 9 page 24*
- global warming** (Earth science)
 MAIN ARTICLE *volume 5 page 120, picture, volume 5 page 120*
 MORE TO EXPLORE
 causes
 climate *volume 3 page 138*
 deforestation
 rain forest burning *volume 11 page 25*
 greenhouse effect *volume 5 page 157*
 petroleum *volume 10 page 68*
 pollution *volume 10 page 118*
 effects
 Arctic Ocean *volume 1 page 174*
 glacier *volume 5 page 117*
 environment *volume 4 page 144*
- globe** (cartography)
 MAIN ARTICLE *volume 8 page 48, picture, volume 8 page 49, picture, volume 8 page 49*
- Globe Theatre** (historic theater in London, United Kingdom) *picture, volume 13 page 58*
 theater *volume 13 page 58*
- Gloss Mountain State Park** (park in Oklahoma, U.S.) *picture, volume 9 page 130*
- glowworm** (insect)
 firefly *volume 5 page 27*
 types of beetles *picture, volume 2 page 49*
- glucagon** (hormone)
 endocrine system *volume 4 page 136*
 pancreas *volume 10 page 24*
- glucose** (biochemistry)
 diabetes *volume 4 page 43*
 pancreas *volume 10 page 24*
- gnomon** (timekeeping device)
 sundial *volume 12 page 204, picture, volume 12 page 204*
- gnu** (mammal)
 antelope *volume 1 page 138*
 migration in Kenya *picture, volume 8 page 125*
- Goa** (island and state in India)
 Gama *volume 5 page 83*
- goal** (sports)
 ice hockey *volume 6 page 68, picture, volume 6 page 68*
 lacrosse *volume 7 page 100*
 rugby *volume 11 page 102*
 soccer *volume 12 page 116, picture, volume 12 page 117*
- goalkeeper** (sports)
 ice hockey *volume 6 page 68*
 soccer *volume 12 page 117, picture, volume 12 page 118*
- goal line** (sports)
 football *volume 5 page 48*
 rugby *volume 11 page 102*
 soccer *picture, volume 12 page 117*
- goalpost** (sports)
 rugby *volume 11 page 102*
- goat** (mammal)
 MAIN ARTICLE *volume 5 page 121, picture, volume 5 page 121*
- Gobi** (desert in Asia)
 MAIN ARTICLE *volume 5 page 122, picture, volume 5 page 122*
 MORE TO EXPLORE
 desert *volume 4 page 40*
- Gobind Singh** (Sikh Guru)
 Sikhism *volume 12 page 88*
- goby** (fish)
 fish *volume 5 page 27*
- God** (biblical)
 Christianity *volume 3 page 112*
- god** (supreme being)
 religion *volume 11 page 42*
- Goddard, Robert H.** (U.S. scientist)
 rocket *volume 11 page 77*
- “God Save the Queen”** (British national anthem)
 national anthem *volume 9 page 13*

Godwin, Mary Wollstonecraft (English feminist): *see in index* Wollstonecraft, Mary

Godwin Austen, Mount (mountain in Asia): *see in index* K2

Goering, Hermann (German Nazi leader): *see in index* Göring, Hermann

gold (chemical element)
alchemy *volume 1 page 71*
gold rush *volume 5 page 123, picture, volume 5 page 124*
money *volume 8 page 160*
South African miners *picture, volume 8 page 133*

Gold Coast (historic region in Africa): *see in index* Ghana

Gold Coast (historical British colony and region in Africa)
Ashanti *volume 1 page 198*

golden anteater (mammal): *see in index* two-toed anteater

golden eagle (bird)
eagle *volume 4 page 86*

Golden Gate Bridge (bridge in California, U.S.) *picture, volume 3 page 12*

golden hamster (rodent) *picture, volume 6 page 11*
hamster *volume 6 page 11*

Golden Horde (western part of the Mongol Empire)
Mongol Empire *volume 8 page 162*

golden jackal (mammal)
jackal *volume 7 page 4*

golden retriever (breed of dog)
sporting dogs *table, volume 4 page 62*

Golden State (state in the U.S.): *see in index* California

Golden Temple (temple in Amritsar, India): *see in index* Harimandir

goldfinch (bird)
American goldfinch *picture, volume 5 page 21*
finch *volume 5 page 21*

goldfish
MAIN ARTICLE *volume 5 page 123, picture, volume 5 page 123*

gold rush
MAIN ARTICLE *volume 5 page 123, picture, volume 5 page 124*

MORE TO EXPLORE
Black Hills *volume 2 page 87*
California: *see in index* California Gold Rush
Denver *volume 4 page 39*
Idaho *volume 6 page 112*
Boise *volume 2 page 100*
Montana *volume 6 page 34, volume 8 page 174*
Yukon *volume 15 page 98*

golf (sport)
MAIN ARTICLE *volume 5 page 124*
MORE TO EXPLORE
water hazard *picture, volume 5 page 126*

golf ball (sports equipment)
golf *volume 5 page 126*

golf club (sports equipment)
golf *volume 5 page 125*

goliath heron (bird)
heron *volume 6 page 47*

gondola (boat)
canal *volume 3 page 28*
Venice *volume 14 page 65, picture, volume 3 page 28, picture, volume 14 page 65*

Gondwanaland (supercontinent)
plate tectonics *volume 10 page 99*

gong (musical instrument)
percussion instruments *picture, volume 8 page 215*

Gonzales, Alberto R. (U.S. attorney general) *picture, volume 6 page 61*

Goodall, Jane (British scientist)
MAIN ARTICLE *volume 5 page 126, picture, volume 5 page 127*

Good Friday (Christian holy day)
Easter *volume 4 page 93*

Good Friday Agreement (Ireland and the United Kingdom, 1998): *see in index* Belfast Agreement

Good Hope, Cape of (promontory of South Africa)
Dias *volume 4 page 45, picture, volume 4 page 44*
Gama *volume 5 page 83*

Goodman, Benny (U.S. musician)
jazz *volume 7 page 16*

goods (things of economic value)
economics *volume 4 page 100*
manufacturing *volume 8 page 46*
trade *volume 13 page 87*
trading baseball cards *picture, volume 13 page 88*

goods wagon (railroad): *see in index* freight car

gooney (seabird): *see in index* albatross

goose (bird)
MAIN ARTICLE *volume 5 page 127*
MORE TO EXPLORE
Canada goose *picture, volume 5 page 127*

Gorbachev, Mikhail (president of the Soviet Union)
MAIN ARTICLE *volume 5 page 128, picture, volume 5 page 128*
MORE TO EXPLORE
Cold War *volume 3 page 151*
Gorbachev *volume 11 page 33*
Soviet Union *volume 14 page 14*
Yeltsin *volume 15 page 89*

Gore, Al (vice president of the U.S.)
Bush *volume 2 page 156*
electoral college *volume 4 page 120*

Gorée Island (island in Senegal)
Dakar *volume 4 page 7*

gorge (landform)
canyon *volume 3 page 31*
valley *volume 14 page 53*

gorget (jewelry)
Mississippian gorget *picture, volume 8 page 143*

gorilla (primate)
MAIN ARTICLE *volume 5 page 129, picture, volume 5 page 129*
MORE TO EXPLORE
apes *volume 1 page 146*
hand *picture, volume 6 page 12*

Gorillini (mammal tribe)
evolution *picture, volume 6 page 94*
human origins *volume 6 page 94*

Göring, Hermann (German Nazi leader)
Nürnberg trials *picture, volume 9 page 110*

gospel music (music)

MAIN ARTICLE *volume 5 page 130*, *picture*, *volume 5 page 130*

Gospels (New Testament)

Bible *volume 2 page 68*

Christianity *volume 3 page 113*

Jesus Christ *volume 7 page 22*

Gothic architecture

architecture *volume 1 page 170*

cathedrals *volume 3 page 60*

Chartres Cathedral *picture*, *volume 8 page 123*

gourd (plant and food)

MAIN ARTICLE *volume 5 page 130*, *picture*, *volume 5 page 131*

government

MAIN ARTICLE *volume 5 page 131*

MORE TO EXPLORE

censorship *volume 3 page 69*

economics *volume 4 page 101*

human rights *volume 6 page 96*

Navajo Supreme Court justices *picture*, *volume 5 page 132*

socialism *volume 12 page 119*

spy *volume 12 page 169*

students at the Arkansas Capitol *picture*, *volume 5 page 132*

tax *volume 13 page 20*

Goyathlay (Apache leader): *see in index* Geronimo

GPS (navigation): *see in index* global positioning system

graft (surgery): *see in index* transplant

Graham, Martha (U.S. dancer)

MAIN ARTICLE *volume 5 page 134*, *picture*, *volume 5 page 134*

MORE TO EXPLORE

dance *volume 4 page 14*

Graill (legendary cup): *see in index* Holy Grail

grain (plant and food)

MAIN ARTICLE *volume 5 page 134*

MORE TO EXPLORE

barley *volume 2 page 28*

grains for sale at a market *picture*, *volume 5 page 135*

grasses *volume 5 page 141*

woman pouring millet *picture*, *volume 5 page 135*

gram (unit of measure)

common abbreviations *table*, *volume 1 page 8*

measurement *volume 8 page 90*

grammar (rules of a language)

MAIN ARTICLE *volume 5 page 135*

MORE TO EXPLORE

language *volume 7 page 105*

Granada (historical kingdom in Spain)

Moor *volume 8 page 180*

Gran Chaco (plain in South America)

Argentina *volume 1 page 175*

Gran Colombia (historic republic in South America)

Colombia *volume 3 page 153*

Ecuador *volume 4 page 103*

Panama *volume 10 page 22*

Venezuela *volume 14 page 64*

Grand Bahama Canyon (submarine landform in the Atlantic Ocean)

canyon formation *volume 3 page 31*

Grand Canal (canal in China)

canal *volume 3 page 28*

Grand Canal (canal in Venice, Italy)

Venice *picture*, *volume 14 page 65*

Grand Canyon (canyon in Arizona, U.S.)

MAIN ARTICLE *volume 5 page 136*, *picture*, *volume 5 page 136*

MORE TO EXPLORE

Arizona *volume 1 page 178*

canyon *volume 3 page 31*

Colorado River *volume 3 page 159*

Coronado *volume 3 page 200*

erosion *volume 4 page 152*

images

church service *picture*, *volume 4 page 93*

Deer Creek *picture*, *volume 3 page 31*

Havasu Falls *picture*, *volume 15 page 24*

valley *volume 14 page 53*

Grand Canyon National Park (national park in Arizona, U.S.)

Colorado River *picture*, *volume 3 page 159*

Deer Creek *picture*, *volume 3 page 31*

Grand Canyon *volume 5 page 137*

Grand Canyon State (state in the U.S.): *see in index* Arizona *see in index* Grand Canal

Grande Comore (island of Comoros): *see in index* Ngazidja

Grande-Terre (island in Guadeloupe) Guadeloupe *volume 5 page 164*

Grand Haven (city in Michigan, U.S.) lighthouse *picture*, *volume 8 page 116*

Grand Mosque of Manama (mosque in Manama, Bahrain) *picture*, *volume 8 page 39*

Grand Mosque of Tunis (mosque in Tunis, Tunisia) *picture*, *volume 13 page 108*

Grand National Mosque (mosque in Islamabad, Pakistan) *picture*, *volume 6 page 166*

Grand Ole Opry (music show in Nashville, Tennessee, U.S.) Nashville *volume 9 page 11*

Grand Place (square in Brussels, Belgium) *picture*, *volume 2 page 138*

Grand Slam (golf) Woods *volume 15 page 60*

Grand Slam (tennis) tennis *volume 13 page 46*

Grand Teton National Park (national park in Wyoming, U.S.) Wyoming *picture*, *volume 15 page 79*

Granger movement (U.S. farm coalition) Iowa *volume 6 page 146*

granite (rock) Concord *volume 3 page 175*

granite moss (plant) moss *volume 8 page 190*

Granite State (state in the U.S.): *see in index* New Hampshire

Grant, Ulysses S. (president of the U.S.) MAIN ARTICLE *volume 5 page 137*, *picture*, *volume 5 page 137*

MORE TO EXPLORE

American Civil War *volume 1 page 96*

Lee *picture*, *volume 1 page 98*

timeline *volume 5 page 137*

grape (vine and fruit)

MAIN ARTICLE *volume 5 page 138*, *picture*, *volume 5 page 139*

MORE TO EXPLORE

fermentation *volume 5 page 11*

fruit *picture*, *volume 5 page 72*

grape harvest in Italy *picture, volume 6 page 172*

grapefruit (tree and fruit)

MAIN ARTICLE *volume 5 page 139, picture, volume 5 page 139*

MORE TO EXPLORE

citrus fruits *volume 3 page 123*

graph (diagram)

MAIN ARTICLE *volume 5 page 140*

graphic scale (cartography)

map and globe *volume 8 page 49*

grass (plant)

MAIN ARTICLE *volume 5 page 141*

MORE TO EXPLORE

images

American dog tick *picture, volume 13 page 63*

Central Park *picture, volume 5 page 141*

root system *picture, volume 11 page 96*

Strzelecki Desert *picture, volume 12 page 145*

marsh *volume 8 page 60*

grasshopper (insect)

MAIN ARTICLE *volume 5 page 142, picture, volume 5 page 142*

MORE TO EXPLORE

digestive system *picture, volume 4 page 48*

exoskeleton *picture, volume 6 page 139*

invertebrate animals *picture, volume 9 page 34*

muscle attachment *picture, volume 8 page 207*

respiratory system *picture, volume 11 page 54*

sensory reception *picture, volume 12 page 68*

grasshopper warbler (bird) *picture, volume 12 page 132*

grassland (life zone)

MAIN ARTICLE *volume 5 page 142, picture, volume 5 page 143, picture, volume 5 page 143*

MORE TO EXPLORE

biome *volume 2 page 74*

grass *volume 5 page 141*

gravity (physics)

MAIN ARTICLE *volume 5 page 144, picture, volume 5 page 144, picture, volume 5 page 144*

MORE TO EXPLORE

black hole *volume 2 page 87*

erosion *picture, volume 4 page 152*

force *volume 5 page 51*

Moon *volume 8 page 178*

Newton *volume 9 page 56*

solar system *volume 12 page 128*

star *volume 12 page 180*

tides *volume 13 page 64, picture, volume 13 page 64*

water *volume 15 page 23*

gray fox (mammal)

fox *volume 5 page 57*

gray whale (mammal)

whale species *picture, volume 15 page 37*

gray wolf (mammal) *picture, volume 15 page 54*

wolf *volume 15 page 54*

grease

petroleum *volume 10 page 68*

Great Alfold (region in Hungary)

Hungary *volume 6 page 100*

great ape (primate)

apes *volume 1 page 146*

gibbon *volume 5 page 113*

Great Artesian Basin (basin in Australia)

South Australia *volume 12 page 145*

Great Atlantic Migration (international history): *see in index* Atlantic Migration

Great Australian Basin (basin in Australia): *see in index* Great Artesian Basin

great barracuda (fish) *picture, volume 2 page 29*

barracudas *volume 2 page 29*

Great Barrier Reef (reef in Australia)

MAIN ARTICLE *volume 5 page 145*

MORE TO EXPLORE

Australia *volume 1 page 229*

coral *volume 3 page 197, picture, volume 5 page 145*

Queensland *volume 11 page 10*

Great Basin (region in the U.S.)

Native Americans *volume 9 page 18*

Great Basin Indian (Native American people): *see in index* Comanche; Paiute; Shoshone; Ute

Great Bermuda (island in the Bermuda, Atlantic Ocean)
Bermuda *volume 2 page 62*

great blue heron (bird) *picture, volume 6 page 47*

bill structure and eating habits *picture, volume 2 page 77*

heron *volume 6 page 47*

Great Britain (island in Europe)

MAIN ARTICLE *volume 5 page 145*

Great Britain (island country in Europe): *see in index* United Kingdom

Great Britain and Northern Ireland, United Kingdom of (island country in Europe): *see in index* United Kingdom

Great Charter (English charter, 1215): *see in index* Magna Carta

Great Colombia (historic republic in South America): *see in index* Gran Colombia

Great Crash, The (U.S. history): *see in index* Stock Market Crash of 1929

Great Dane (breed of dog)
dog *table, volume 4 page 62*

Great Depression (economy)

MAIN ARTICLE *volume 5 page 146*

MORE TO EXPLORE

banking *volume 2 page 25*

Dust Bowl *volume 4 page 84*

Hoover *volume 6 page 81*

Roosevelt, Eleanor *volume 11 page 91*

Roosevelt, Franklin *volume 11 page 93*

soup and bread line *picture, volume 5 page 146*

United States *volume 14 page 30*

Great Dividing Range (mountain range in Australia)

Australia *volume 1 page 229*

Queensland *volume 11 page 10*

Great Dyke (hill region in Zimbabwe)
Zimbabwe *volume 15 page 105*

Great Enclosure (ancient structure, Great Zimbabwe, Zimbabwe)
Great Zimbabwe *volume 5 page 150*

Greater Antilles (island group of the West Indies)
West Indies *volume 15 page 32*

greater roadrunner (bird)
roadrunner *volume 11 page 71*

“Great Expectations” (work by Dickens)
Dickens *volume 4 page 45*

Great Lakes (lake system in North America)

MAIN ARTICLE *volume 5 page 147*

MORE TO EXPLORE

history

Champlain *volume 3 page 81*

Pontiac *volume 10 page 123*

North America *volume 9 page 79*

Saint Lawrence River and Seaway *volume 12 page 13*

United States *volume 14 page 26*

Great Lakes State (state in the U.S.): *see in index* Michigan

Great Leap Forward (Chinese history)

China *volume 3 page 104*

Mao *volume 8 page 48*

Great Man-Made River (aqueduct in Libya, Africa)

Libya *volume 7 page 144*

Great Migration (African American history)

African Americans *volume 1 page 44*

Great Mosque (mosque in Mecca, Saudi Arabia): *see in index* Haram Mosque, al-

Great Oyster Bay (island in New York, U.S.): *see in index* Liberty Island

Great Plains (region of North America)

Coronado *volume 3 page 200*

United States *volume 14 page 24*

Great Pyramid (pyramid in Egypt)

pyramid *volume 10 page 171*

Great Red Spot (storm system on Jupiter)

Jupiter *volume 7 page 41*

Great Rift Valley (geological feature in Africa and Asia)

Africa *volume 1 page 38*

Malawi *volume 8 page 26*

Great Salt Lake (lake in Utah, U.S.)

lake *volume 7 page 102*

salt crystals *picture, volume 14 page 45*

Great Serpent Mound (anthropological site in Ohio, U.S.)

Adena culture *volume 1 page 29*

great silver water beetle (insect)

types of beetles *picture, volume 2 page 49*

Great Smoky Mountains (mountain range, North Carolina and Tennessee, U.S.)

North Carolina *volume 9 page 85, picture, volume 9 page 85*

Tennessee *volume 13 page 43*

Great Society (United States policy)

Johnson *volume 7 page 29*

Great Sphinx (monument at Giza, Egypt)

ancient Egypt *volume 4 page 114*

sphinx *volume 12 page 163, picture, volume 12 page 163*

great spotted woodpecker (bird) *picture, volume 15 page 58*

Great Temple (archaeological site in Egypt): *see in index* Abu Simbel

Great Temple (Judaism): *see in index* Jerusalem, Temple of

Great Trek (South African history)

South Africa *volume 12 page 138*

Great Victoria Desert (desert, Australia)

MAIN ARTICLE *volume 5 page 148*

Great Wall of China (fortress-wall in China)

MAIN ARTICLE *volume 5 page 148, picture, volume 5 page 149*

Great War (1914-18): *see in index* World War I

great white shark (fish): *see in index* white shark

Great Zimbabwe (ancient city in Zimbabwe)

MAIN ARTICLE *volume 5 page 149, picture, volume 5 page 149*

MORE TO EXPLORE

civilization *volume 3 page 127*

Zimbabwe *volume 15 page 106*

Greco, El (Spanish painter)

MAIN ARTICLE *volume 5 page 150, picture, volume 5 page 150*

Greco-Persian Wars (ancient history): *see in index* Persian Wars

Greco-Roman wrestling (sport)

wrestling *volume 15 page 73*

Greco-Turkish wars (European history, 1917-22)

Greece *volume 5 page 152*

Greece (country in Europe)

MAIN ARTICLE *volume 5 page 151*

MORE TO EXPLORE

folk dance *picture, volume 5 page 153*

geography

Aegean Sea *volume 1 page 34*

Athens *picture, volume 1 page 218*

Delphi temple ruins *picture, volume 4 page 33, picture, volume 5 page 154*

Mount Olympus *volume 9 page 135*

Oia *picture, volume 5 page 152*

history

ancient Greece: *see in index* Greece, ancient

Cyprus *volume 3 page 236*

Nicosia *volume 9 page 66*

timeline *volume 5 page 151*

Greece, ancient (historic region in Eurasia)

MAIN ARTICLE *volume 5 page 154*

MORE TO EXPLORE

arts

architecture *volume 1 page 169*

temple *volume 13 page 42*

Tholos at Delphi *picture, volume 5 page 154*

calligraphy *volume 3 page 15*

dance *volume 4 page 13*

drama *volume 4 page 73, volume 13 page 58*

mosaic *picture, volume 5 page 155*

painting *volume 10 page 8*

pottery *picture, volume 10 page 139*

sculpture *volume 12 page 56, picture, volume 2 page 134*

banking *volume 2 page 25*

government and law

human rights *volume 6 page 97*

law *volume 7 page 117*

history

Aegean civilization *volume 1 page 33*

ancient Rome *volume 11 page 88*

city-state *volume 3 page 126*

empire *volume 4 page 131*

Europe *volume 4 page 163*

Persian Wars *volume 10 page 63*

polar exploration *volume 10 page 110*

people and culture

delta *volume 4 page 33*

fig *volume 5 page 18*

laurel *volume 7 page 116*

mythology *volume 8 page 223*

olive *volume 9 page 131*

slavery *volume 12 page 106*

sphinx *volume 12 page 163*

philosophy *volume 10 page 73*
 science and technology
 anatomy *volume 1 page 115*
 brass *volume 2 page 123*
 mining *volume 8 page 134*
 robot *volume 11 page 74*
 sundial *volume 12 page 204*
 sports *volume 12 page 168*
 archery *volume 1 page 166*
 boxing *volume 2 page 119*
 Olympic Games *volume 9 page 134*
 swimming *volume 12 page 217*
 wrestling *volume 15 page 73*

Greek alphabet
 alphabet *volume 1 page 89*

Greek Civil War (Greek history)
 Greece *volume 5 page 153*

Greek language
 Aegean civilization *volume 1 page 34*
 Bible *picture, volume 2 page 68*

Greek mythology (legends and stories of ancient Greece)
 Athena *volume 1 page 217*
 images
 Hades *picture, volume 6 page 5*
 Poseidon *picture, volume 10 page 135*
 sphinx *volume 12 page 163*

Greek Orthodox Church (Christianity):
see in index Eastern Orthodox Churches

Greek pottery
 vase *picture, volume 12 page 160*

Greek temple (architecture)
 architecture *volume 1 page 169*

green (color)
 light *picture, volume 3 page 155*
 pigment *picture, volume 3 page 156*

green (golf)
 golf *volume 5 page 125*

green frog (amphibian): *see in index*
 green tree frog

green heron (bird)
 heron *volume 6 page 47*

greenhouse effect (atmospheric science)
 MAIN ARTICLE *volume 5 page 157, picture, volume 5 page 157*
 MORE TO EXPLORE
 fossil fuel *volume 5 page 56*
 global warming *volume 5 page 120*

greenhouse gas (atmospheric science)
 climate *volume 3 page 138*
 global warming *volume 5 page 120*
 greenhouse effect *volume 5 page 157*

Greenland (island and dependency of Denmark)
 MAIN ARTICLE *volume 5 page 157*

MORE TO EXPLORE
 glacier *volume 5 page 116*
 history
 Eriksson *volume 7 page 126*
 Peary *volume 10 page 48*
 travel by dogsled *picture, volume 5 page 158*

Greenland Sea (extension of the Arctic Ocean)
 Arctic Ocean *volume 1 page 172*

green mamba (snake)
 hatching from egg *picture, volume 12 page 115*

Green Mountain Boys (U.S. history)
 Allen *volume 1 page 83*

Green Mountains (mountain range in Vermont, U.S.)
 Vermont *volume 14 page 68*

Green Mountain State (state in the U.S.): *see in index* Vermont

green peacock (bird)
 peacock *volume 10 page 46*

Green Revolution (agricultural and political movement)
 MAIN ARTICLE *volume 5 page 159*

Green Room (room in the White House, Washington, D.C.) *picture, volume 15 page 42*

green tiger beetle (insect)
 types of beetles *picture, volume 2 page 49*

green tree frog (amphibian) *picture, volume 1 page 110*

green tree python (snake) *picture, volume 10 page 172*

green tree snake (reptile)
 various snakes *picture, volume 12 page 113*

green violet-ear hummingbird *picture, volume 6 page 98*

Greenwich meridian (geography)
 hemisphere *volume 6 page 38*
 latitude and longitude *volume 7 page 114*
 time and time zones *volume 13 page 67*

Gregorian calendar
 calendar *volume 3 page 10*

Gregory IX (pope)
 Inquisition *volume 6 page 137*

Gregory XIII (pope)
 calendar *volume 3 page 10*

Gregory the Illuminator (Armenian apostle)
 Khor Virap monastery *picture, volume 1 page 184*

“Gremlins, The” (novel by Dahl)
 Dahl *volume 4 page 5*

Grenada (island country in the West Indies)
 MAIN ARTICLE *volume 5 page 160*

MORE TO EXPLORE
 Saint George’s *picture, volume 12 page 11*

grenade (military technology)
 bomb *volume 2 page 104*

Grenadines (islands in the West Indies)
 Grenada *volume 5 page 160*

Gretzky, Wayne (Canadian athlete)
 MAIN ARTICLE *volume 5 page 161, picture, volume 5 page 161*

Grevy’s zebra
 zebra *volume 15 page 102*

greyhound (breed of dog)
 hound breeds *table, volume 4 page 62*

Griffin, Walter Burley (U.S. architect)
 Canberra *volume 3 page 29*

Grimaldi family (Italian family)
 Monaco *volume 8 page 158*

Grimké, Angelina (U.S. abolitionist)
 MAIN ARTICLE *volume 5 page 161, picture, volume 5 page 162*

Grimké, Sarah (U.S. abolitionist)
 MAIN ARTICLE *volume 5 page 161, picture, volume 5 page 162*

Grimm brothers (German folklorists)
 MAIN ARTICLE *volume 5 page 162, picture, volume 5 page 162*

MORE TO EXPLORE

folktale *volume 5 page 43*
 literature for children *volume 7 page 164*

“Grimm’s Fairy Tales” (work by Jacob Grimm and Wilhelm Grimm)
 Grimm brothers *volume 5 page 163*
 literature for children *volume 7 page 164*
 Pied Piper of Hamelin *picture, volume 5 page 162*

Grito de Dolores (Mexican history)
 Hidalgo y Costilla *volume 6 page 52*

grizzly bear (mammal)
 bear *volume 2 page 41*

Groot Trek (South African history): *see in index* Great Trek

Gros and Petit Pitons (geologic formation in Saint Lucia)
 Soufrière *picture, volume 12 page 14*

Groseilliers, Médart Chouart, sieur de (French fur trader)
 fur trade *volume 5 page 76*

Grossglockner (mountain in Austria)
 Austria *volume 1 page 233*

Gros Ventre (Native American people)
 MAIN ARTICLE *volume 5 page 163, picture, volume 5 page 163*

ground attack aircraft: *see in index* attack aircraft

groundhog (rodent)
 MAIN ARTICLE *volume 5 page 164, picture, volume 5 page 164*
 MORE TO EXPLORE
 hibernation *volume 6 page 49*

Groundhog Day (weather folklore)
 groundhog *volume 5 page 164*

ground ice (geology): *see in index* permafrost

groundnut (plant and food): *see in index* peanut

ground squirrel (rodent)
 hibernation *volume 6 page 49*

groundwater (water below Earth’s surface)
 water cycle *picture, volume 15 page 23*

growth (biology)
 living thing *volume 7 page 168*

pituitary gland *picture, volume 4 page 136*

growth hormone (biochemical compound)
 pituitary gland *picture, volume 4 page 136*

guacamole (food)
 avocado *volume 1 page 238*

Guadalcanal Island (island in Solomon Islands)
 Honiara *volume 6 page 78*

Guadalupe Hidalgo, Treaty of (Mexico-U.S., 1848)
 Mexican War *volume 8 page 109*

Guadeloupe (French overseas department in the Caribbean Sea)
 MAIN ARTICLE *volume 5 page 164*

MORE TO EXPLORE
 Marigot market *picture, volume 5 page 165*

Guaitara River (river in South America)
 church in Colombia *picture, volume 3 page 153*

Guam (island and U.S. territory in the Pacific Ocean)
 MAIN ARTICLE *volume 5 page 165*

guanine (chemical compound)
 DNA *volume 4 page 61*

Guaraní (Native American people)
 Asunción *volume 1 page 216*
 Paraguay *volume 10 page 31*
 South America *volume 12 page 144*

Guatemala (country in Central America)
 MAIN ARTICLE *volume 5 page 166, picture, volume 5 page 167*

MORE TO EXPLORE
 geography
 Guatemala City *picture, volume 5 page 168*
 Mayan temple ruins *picture, volume 3 page 75*
 people and culture
 Roman Catholic church *picture, volume 7 page 112*
 vegetable market *picture, volume 3 page 75*

Guatemala City (capital city of Guatemala)
 MAIN ARTICLE *volume 5 page 168, picture, volume 5 page 168*

MORE TO EXPLORE

Guatemala *volume 5 page 166*

Gudenå River (river in Denmark)
 Denmark *volume 4 page 36*

“Guernica” (work by Picasso)
 Picasso *volume 10 page 80*

guide dog
 cerebral palsy *picture, volume 3 page 77*

Guides (youth organization): *see in index* Girl Scouts

guild (trade association)
 labor *volume 7 page 96*

Guinea (country in Africa)
 MAIN ARTICLE *volume 5 page 169*

Guinea-Bissau (country in Africa)
 MAIN ARTICLE *volume 5 page 170*

guinea pig (rodent)
 MAIN ARTICLE *volume 5 page 171, picture, volume 5 page 171*
 MORE TO EXPLORE
 rodent *volume 11 page 80*

guitar (musical instrument)
 stringed instruments *picture, volume 8 page 216*

Guiteau, Charles J. (U.S. politician)
 Garfield’s assassination *volume 5 page 89*

Gulf of: *see in index under the specific part of the name, for example, Mexico, Gulf of except as found below*

Gulf of Tonkin Resolution (U.S. policy, 1964)
 Vietnam War *volume 14 page 87*

Gulf War (1991): *see in index* Persian Gulf War

gull (bird)
 MAIN ARTICLE *volume 5 page 171, picture, volume 5 page 171*

“Gulliver’s Travels” (work by Swift)
 literature for children *volume 7 page 163*

gum (anatomy)
 mouth anatomy *picture, volume 8 page 197*
 teeth *volume 13 page 31*

gum tree: *see in index* eucalyptus

gun (weapon)

castle *volume 3 page 54*
 war *volume 15 page 10*
 tanks *picture, volume 15 page 10*
 weapon *volume 15 page 26*
 Whitney *volume 15 page 43*

gunpowder (explosive)

army *volume 1 page 190*
 technology and invention *volume 13 page 26*
 war *volume 15 page 10*
 weapon *volume 15 page 25*

Gupta Dynasty (Indian dynasty)

India *volume 6 page 124*

guru (Sikh teacher)

Sikhism *volume 12 page 87*

“Guru Granth Sahib” (Sikh sacred scripture): *see in index* “Adi Granth”**Gustav II Adolf** (king of Sweden)

Sweden *volume 12 page 214*

Gutenberg, Johannes (German printer)

MAIN ARTICLE *volume 5 page 172*

MORE TO EXPLORE

book and bookmaking *volume 2 page 110*
 Gutenberg Bible *picture, volume 5 page 172*
 literature *volume 7 page 162*
 newspaper *volume 9 page 55*
 printing *volume 10 page 153, picture, volume 10 page 152*

Gutenberg Bible *picture, volume 5 page 172*

Gutenberg *volume 5 page 172*

gutra (headdress) *picture, volume 11 page 4***Guyana** (country in South America)

MAIN ARTICLE *volume 5 page 173*

Gyanendra Bir Bikram Shah Dev (king of Nepal)

coronation, June 4, 2001 *picture, volume 8 page 159*
 Nepal *volume 9 page 32*

gymnastics

MAIN ARTICLE *volume 5 page 174, picture, volume 5 page 174, picture, volume 5 page 175, picture, volume 5 page 176*

MORE TO EXPLORE

Olympic Games *volume 9 page 133*

gypsum (mineral)

chalk *volume 3 page 79*

Gypsy (people): *see in index* Rom**gyrfalcon** (bird)

falcon *volume 5 page 5*

gyrocompass (navigation instrument)

compass *volume 3 page 171*

gyroscope

MAIN ARTICLE *volume 5 page 176, picture, volume 5 page 176*

MORE TO EXPLORE

compass *volume 3 page 171*

**habitat** (living-environment of a particular life form)

MAIN ARTICLE *volume 6 page 4, picture, volume 6 page 4*

MORE TO EXPLORE

endangered species *volume 4 page 133*
 extinct animals *volume 1 page 126*

Habitat for Humanity (philanthropic organization)

Carter *volume 3 page 47*

Habsburg, House of (European dynasty): *see in index* Hapsburgs**Hades** (Greek god)

MAIN ARTICLE *volume 6 page 4, picture, volume 6 page 5*

MORE TO EXPLORE

Demeter *volume 4 page 34*
 Orpheus and Eurydice *volume 9 page 152*
 Poseidon *volume 10 page 135*

Hades (mythical place)

Hermes *volume 6 page 47*

Hadrian's Wall (ancient Roman wall in England, United Kingdom) *picture, volume 4 page 131***Haggard, Merle** (U.S. singer)

country music *volume 3 page 208*

Hagia Sophia (church in Istanbul, Turkey) *picture, volume 13 page 112*

architecture *volume 1 page 169*

Istanbul *volume 6 page 171*

Hague, The (parliamentary and judicial capital of The Netherlands)

MAIN ARTICLE *volume 6 page 5, picture, volume 6 page 6*

MORE TO EXPLORE

Netherlands, The *volume 9 page 38*

Hahnemann, Samuel (German physician)

homeopathy *volume 6 page 76*

Haida (Native American people)

MAIN ARTICLE *volume 6 page 6*

MORE TO EXPLORE

British Columbia *volume 2 page 132*
 Haida wood carving *picture, volume 6 page 6*

Haifa (city in Israel) *picture, volume 6 page 170***haiku** (Japanese poetry)

Basho *volume 2 page 33*
 poetry *volume 10 page 106*

hail (weather)

storm *volume 12 page 192*

hailstorm (weather)

storm *volume 12 page 192*

hair (anatomy)

MAIN ARTICLE *volume 6 page 7*

MORE TO EXPLORE

cosmetics *volume 3 page 202*
 mammal *volume 8 page 36, picture, volume 8 page 36*

hairy-footed pygmy gerbil (rodent) *picture, volume 5 page 104***hairy hedgehog** (mammal)

hedgehog *volume 6 page 34*

Haiti (country in the West Indies)

MAIN ARTICLE *volume 6 page 8*

MORE TO EXPLORE

history
 Dominican Republic *volume 4 page 66*
 Toussaint Louverture *volume 13 page 83, picture, volume 13 page 83*
 La Citadelle Laferrière *picture, volume 6 page 9*
 man selling paintings *picture, volume 6 page 8*
 parade *picture, volume 10 page 130*

hajj (Islam)Islam *volume 6 page 164*Mecca *volume 8 page 91*pilgrimage *volume 10 page 85***Hale, Sarah Josepha** (U.S. author)Thanksgiving *volume 13 page 57***half-pipe course** (snowboarding) *picture, volume 12 page 100***Halifax** (provincial capital of Nova Scotia, Canada)Nova Scotia *volume 9 page 101***Halla, Mount** (mountain in South Korea)South Korea *volume 7 page 82***Halley's Comet** (astronomy)comet *volume 3 page 166***Halloween**MAIN ARTICLE *volume 6 page 10*

MORE TO EXPLORE

costumes *picture, volume 6 page 10***halo** (art) *picture, volume 7 page 22***halogen** (family of chemical elements)periodic table *table, volume 3 page 86***Halonen, Tarja** (president of Finland)*picture, volume 11 page 53*Finland *volume 5 page 23***Haman** (biblical figure)Purim *volume 10 page 168***hamantaschen** (pastry)Purim *volume 10 page 168***Hamasaka** (Kwakiutl chief) *picture, volume 7 page 93, picture, volume 7 page 93***Hamilton** (capital city of Bermuda)Bermuda *volume 2 page 62***Hamilton, Alexander** (U.S. statesman)MAIN ARTICLE *volume 6 page 10, picture, volume 6 page 10*

MORE TO EXPLORE

Adams *volume 1 page 23*Federalist papers *volume 5 page 9, picture, volume 5 page 9*Jefferson *volume 7 page 18***Hamm, Mia** (U.S. athlete) *picture, volume 12 page 118***hammerhead shark** (fish) *picture, volume 12 page 77***Hammerin' Hank** (U.S. baseball player):*see in index* Aaron, Hank**hammer throw** (athletics)track and field *volume 13 page 86, picture, volume 13 page 85***hammock** (landform)Everglades *volume 4 page 168***Hammurabi** (king of Babylon) *picture, volume 3 page 127*law *volume 7 page 117*Mesopotamia *volume 8 page 104*stone carving *picture, volume 7 page 117***Hampton University** (university in

Hampton, Virginia, U.S.)

Washington *volume 15 page 17***hamster** (rodent)MAIN ARTICLE *volume 6 page 11, picture, volume 6 page 11*

MORE TO EXPLORE

rodent *volume 11 page 80***Han** (Asian people)China *volume 3 page 101***Hancock, John** (U.S. statesman)Revere *volume 11 page 57***Hancock, Winfield Scott** (U.S. military officer)Garfield *volume 5 page 88***hand** (anatomy)MAIN ARTICLE *volume 6 page 12, picture, volume 6 page 12*

MORE TO EXPLORE

arthritis *picture, volume 1 page 191*primate *volume 10 page 148***handicap** (medical disorder): *see in index* disability**handlebars** (vehicle parts)motorcycle *volume 8 page 192***handset** (communications device)telephone *volume 13 page 36***handwriting**: *see in index* calligraphy**Handy, W. C.** (U.S. composer)blues *volume 2 page 95***Hannibal** (Carthaginian general, 247-183 BC)Carthage *volume 3 page 48***Hannu** (Egyptian explorer)exploration *volume 4 page 173***Hanoi** (capital city of Vietnam)MAIN ARTICLE *volume 6 page 13*

MORE TO EXPLORE

bridge and pagoda *picture, volume 6 page 13*Vietnam *volume 14 page 84***Hansberry, Lorraine** (U.S. playwright)MAIN ARTICLE *volume 6 page 14, picture, volume 6 page 14***Hanseatic League** (German trading organization)Baltic Sea *volume 2 page 17***Hanukkah** (Judaism)MAIN ARTICLE *volume 6 page 14, picture, volume 6 page 15***Hapsburgs** (European dynasty)MAIN ARTICLE *volume 6 page 15, picture, volume 6 page 15*

MORE TO EXPLORE

Holy Roman Empire *volume 6 page 75*Hungary *volume 6 page 102*Netherlands, The *volume 9 page 39*Spain *volume 12 page 155*Switzerland *volume 12 page 219*Vienna *volume 14 page 82***Harald III Sigurdsson** (king of Norway)Oslo *volume 9 page 154***Haram Mosque, al-** (mosque in Mecca, Saudi Arabia) *picture, volume 8 page 91***Harappa** (ancient city in Pakistan)Indus Valley civilization *volume 6 page 135*ruins *picture, volume 3 page 125***Harare** (capital city of Zimbabwe)MAIN ARTICLE *volume 6 page 16, picture, volume 6 page 16***harbor**MAIN ARTICLE *volume 6 page 17*

MORE TO EXPLORE

Dubrovnik *picture, volume 6 page 17*Moroni *picture, volume 8 page 185*Valletta *picture, volume 14 page 52***harbor porpoise** (mammal) *picture, volume 10 page 129*porpoise *volume 10 page 129***hard-bodied tick** (arachnid): *see in index* hard tick**hard drive** (computing)computer *volume 3 page 173*

Harding, Warren G. (president of the U.S.)

MAIN ARTICLE *volume 6 page 18, picture, volume 6 page 18*

MORE TO EXPLORE
timeline *volume 6 page 18*

hard magnet (physics)
magnet *volume 8 page 19*

hardness (physical quality)
mineral *volume 8 page 132*

hard palate (anatomy)
anatomy of mouth *picture, volume 8 page 197*

hard tick (arachnid)
tick and mite *volume 13 page 63*

“Hard Times” (work by Dickens)
Dickens *volume 4 page 45*

hardware (computing)
computer *volume 3 page 172*
electronic games *volume 4 page 122*

hardwood (type of tree)
forest *volume 5 page 53*

hare (mammal)
MAIN ARTICLE *volume 11 page 13*
MORE TO EXPLORE
jackrabbit *picture, volume 11 page 13*

“Hare and the Tortoise, The” (fable by Aesop)
Aesop *picture, volume 1 page 35*
fable *volume 5 page 4*

Harijan (Hindu social class): *see in index* untouchable

Harimandir (temple in Amritsar, India)
picture, volume 6 page 124
Sikhism *volume 12 page 88*

Harlem Renaissance (U.S. cultural movement)
Hughes *volume 6 page 91*

harmony (music)
music *volume 8 page 213*

Harney Peak (mountain in South Dakota, U.S.)
South Dakota *volume 12 page 149*

Harold II (king of England)
Norman Conquest *volume 9 page 78*

harp (musical instrument family)
musical instruments *volume 8 page 215*

stringed instruments *picture, volume 8 page 216*

Harpers Ferry (town in West Virginia, U.S.)
MAIN ARTICLE *volume 6 page 19*

Harpers Ferry National Historical Park (park in West Virginia, U.S.)
Harpers Ferry *volume 6 page 20*

Harpers Ferry Raid (U.S. history)
Brown *volume 2 page 136*
Harpers Ferry *volume 6 page 19, picture, volume 6 page 19*

harpichord (musical instrument)
musical instruments *volume 8 page 217*

harquebus (gun)
weapon *volume 15 page 26*

Harrisburg (state capital of Pennsylvania, U.S.)
MAIN ARTICLE *volume 6 page 20, picture, volume 6 page 20*

MORE TO EXPLORE
Pennsylvania *volume 10 page 55*

Harrisburg Symphony Orchestra (orchestra of Harrisburg, Pennsylvania)
picture, volume 6 page 20

Harrison, Benjamin (president of the U.S.)
MAIN ARTICLE *volume 6 page 20, picture, volume 6 page 21*

MORE TO EXPLORE
electoral college *volume 4 page 120*
timeline *volume 6 page 20*

Harrison, George (British musician)
the Beatles *volume 2 page 42*

Harrison, William Henry (president of the U.S.)
MAIN ARTICLE *volume 6 page 22, picture, volume 6 page 22*

MORE TO EXPLORE
Indiana *volume 6 page 127*
timeline *volume 6 page 22*
Tyler *volume 13 page 122*
War of 1812 *volume 15 page 13*

“Harry Potter and the Philosopher’s Stone” (work by Rowling)
Rowling *volume 11 page 99*

Hartford (state capital of Connecticut, U.S.)
MAIN ARTICLE *volume 6 page 23*

MORE TO EXPLORE

Connecticut *volume 3 page 184*
Mark Twain home *picture, volume 3 page 185*
State Capitol building *picture, volume 6 page 24*

“Hartford Courant” (U.S. newspaper)
Hartford *volume 6 page 24*

Hartland (town in New Brunswick, Canada)
covered bridge *picture, volume 9 page 43*

Hartog, Dirck (Dutch explorer)
Australia *volume 1 page 231*

Harvard University (university in Cambridge, Massachusetts, U.S.) *picture, volume 8 page 73*
Boston *volume 2 page 114*
football *volume 5 page 50*
Massachusetts *volume 8 page 72*

harvester ant (insect)
nest *picture, volume 1 page 133*

Hashimite Kingdom of Jordan: *see in index* Jordan

hashish (hallucinogenic drug)
assassination *volume 1 page 210*

Hashshashin (Islamic group): *see in index* Assassin

hat
early 1900s fashion *picture, volume 3 page 141*

hatching (reproductive process)
green mamba *picture, volume 12 page 115*

hatching (drawing technique)
drawing *volume 4 page 75*

Hatha Yoga
yoga *volume 15 page 93*

Hatshepsut (queen of Egypt)
MAIN ARTICLE *volume 6 page 24, picture, volume 6 page 24*
MORE TO EXPLORE
pharaoh *volume 10 page 69*

Hatteras Island (island in North Carolina, U.S.)
Cape Hatteras National Seashore *picture, volume 9 page 86*

Haudenosaunee (Native American people): *see in index* Iroquois

Hausa (people)Nigeria *volume 9 page 68***Havana** (capital city of Cuba)MAIN ARTICLE *volume 6 page 25*

MORE TO EXPLORE

cathedral *picture, volume 3 page 228*Cuba *volume 3 page 227*musicians *picture, volume 3 page 228***Havasú Falls** (waterfall in Arizona, U.S.)*picture, volume 15 page 24***Havel, Václav** (president of Czech Republic)Czechoslovakia *volume 3 page 238*Czech Republic *volume 3 page 240***Hawaii** (state and islands in the U.S.)MAIN ARTICLE *volume 6 page 26*

MORE TO EXPLORE

geography and climate

cliffs and Pacific Ocean *picture, volume 6 page 26*island *volume 6 page 167*Kilauea eruption *picture, volume 6 page 27*Waikiki *picture, volume 6 page 79*

history

Asian Americans *volume 1 page 206*Cook *volume 3 page 193***Hawaii** (island in Hawaii, U.S.)Hawaiian geography *volume 6 page 26*rainbow arcs over a beach in Hawaii
*picture, volume 11 page 22***Hawaiian Islands** (islands in the Pacific Ocean): *see in index* Hawaii**Hawaiki** (mythological land)Maori *volume 8 page 47***hawk** (bird)MAIN ARTICLE *volume 6 page 28, picture, volume 6 page 28***hawthorn** (tree and shrub)MAIN ARTICLE *volume 6 page 28, picture, volume 6 page 29***Hayes, Denis** (U.S. organizer of Earth Day)Earth Day *volume 4 page 91***Hayes, George** (U.S. lawyer)school desegregation decision *picture, volume 1 page 44***Hayes, Rutherford B.** (president of the U.S.)MAIN ARTICLE *volume 6 page 29, picture, volume 6 page 29*

MORE TO EXPLORE

electoral college *volume 4 page 120*Reconstruction *volume 11 page 35*timeline *volume 6 page 29***hay fever** (medical disorder)pollen *volume 10 page 117***hazard** (golf)golf *volume 5 page 125*water hazard *picture, volume 5 page 126***hazelnut** (nut and tree)nut *volume 9 page 112, picture, volume 9 page 112***HDL** (biochemistry): *see in index* high-density lipoprotein**HDTV** (electronics): *see in index* high definition TV**He** (chemical element): *see in index* helium**head** (anatomy)ant *volume 1 page 133*insect *volume 6 page 138, picture, volume 6 page 138***head cabbage** (plant)cabbage *volume 3 page 4***head lettuce** (vegetable)lettuce *volume 7 page 135***health**exercise *volume 4 page 172**To learn about some health issues, look for these articles:*

Acupuncture	Food and
Adolescence	Nutrition
Aging	Food Poisoning
Antibiotic	Homeopathy
Burn and Scald	Hormone
Child	Medicine
Development	Memory
Cholesterol	Public Health
Death	Surgery
Disability	Transplant
Drug	Vaccine
Epidemic	Virus
Exercise	Vitamins

Health and Human Services, U.S.

Department of (U.S. government agency)

U.S. government executive departments
*table, volume 14 page 35***health care** (medical treatment and insurance coverage): *see in index* medicine; public health**hearing** (sense)senses *volume 12 page 68, picture, volume 12 page 68***hearing-impaired**: *see in index* deafness**heart** (anatomy)MAIN ARTICLE *volume 6 page 30*

MORE TO EXPLORE

cardiovascular system *volume 3 page 38, picture, volume 3 page 39*blood flow *picture, volume 3 page 38*human heart *picture, volume 6 page 31*muscle *volume 8 page 209*human cardiac muscle *picture, volume 8 page 209*patient on heart machine *picture, volume 6 page 31***heartbeat** (physiology)heart *volume 6 page 31*patient testing heart on machine *picture, volume 6 page 31***heart disease**heart *volume 6 page 32*human disease *volume 4 page 57***hearth** (home fireplace)Hestia *volume 6 page 48***heart muscle** (anatomy): *see in index* cardiac muscle**heartworm** (worm)animal disease *volume 4 page 56***heat** (form of energy)MAIN ARTICLE *volume 6 page 32*

MORE TO EXPLORE

cooking *picture, volume 6 page 32*energy *volume 4 page 137*evaporation and condensation *volume 4 page 166*firefighting *volume 5 page 25*fireplace *picture, volume 5 page 24*radiation *volume 11 page 17*steel mill *picture, volume 5 page 25***heat conduction** (physics): *see in index* conduction

heath (plant)bog *volume 2 page 99*heather *volume 6 page 33***heather** (plant and flower)MAIN ARTICLE *volume 6 page 33, picture, volume 6 page 33***heat-sensitive organ** (anatomy)rattlesnake *volume 11 page 29***Heaven, Temple of** (temple in Beijing, China) *picture, volume 2 page 50***heavy horse** (mammal)horse *volume 6 page 86***heavyweight** (weight class in boxing)boxing *volume 2 page 118***Hebrew** (ancient people)ancient Egypt *volume 4 page 114***Hebrew alphabet**alphabet *volume 1 page 89*calligraphy *volume 3 page 15***Hebrew Bible**Bible *volume 2 page 67*Dead Sea Scrolls *volume 4 page 20*Judaism *volume 7 page 37***Hebrew calendar** (religion): *see in index*

Jewish calendar

Hebrew languageDead Sea Scrolls *picture, volume 4 page 20***hedgehog** (mammal)MAIN ARTICLE *volume 6 page 33, picture, volume 6 page 33*

MORE TO EXPLORE

hibernation *volume 6 page 49***hedgehog skate** (fish): *see in index* little skate**Heel Stone** (Stonehenge)Stonehenge *volume 12 page 190***hegira** (Islam): *see in index* hijrah**heifer** (cow)cattle *volume 3 page 61***height** (measured distance): *see in index* length**Heinlein, Robert** (U.S. author)science fiction *volume 12 page 51***Helena** (state capital of Montana, U.S.)MAIN ARTICLE *volume 6 page 34*

MORE TO EXPLORE

Montana *volume 8 page 173*State Capitol *picture, volume 6 page 34***helicopter** (aircraft)MAIN ARTICLE *volume 6 page 35, picture, volume 6 page 35, picture, volume 6 page 35*

MORE TO EXPLORE

ambulance *volume 1 page 93*Sea Knight helicopter *picture, volume 8 page 56***helium** (chemical element)airship *volume 1 page 58*atom *picture, volume 1 page 225*balloon *volume 2 page 15*Neptune *volume 9 page 33*star *volume 12 page 179*sun *volume 12 page 203***Hellene** (people)ancient Greece *volume 5 page 154***Hellenistic Age**ancient Greece *volume 5 page 156*sculpture *picture, volume 5 page 156***Hellespont** (strait in Turkey): *see in index* Dardanelles**helot** (Greek slave)Sparta *volume 12 page 160***helper cell** (blood cell): *see in index*

helper T cell

helper T cell (blood cell)AIDS *volume 1 page 49***Helsinki** (capital city of Finland)MAIN ARTICLE *volume 6 page 36, picture, volume 6 page 36*

MORE TO EXPLORE

Finland *volume 5 page 22***hemisphere** (geography)MAIN ARTICLE *volume 6 page 37***hemlock** (tree)MAIN ARTICLE *volume 6 page 38, picture, volume 6 page 38***hemoglobin** (biochemical compound)blood *volume 2 page 92*iron *volume 6 page 158***hen** (bird)chicken *volume 3 page 95***Henry II** (king of England)England *volume 4 page 140***Henry IV** (king of France)France *volume 5 page 60*Huguenots *volume 6 page 92***Henry VII** (king of England)Cabot *volume 3 page 4***Henry VIII** (king of England)MAIN ARTICLE *volume 6 page 38, picture, volume 6 page 39*

MORE TO EXPLORE

Protestantism *picture, volume 14 page 18***Henry, Patrick** (U.S. statesman)MAIN ARTICLE *volume 6 page 39, picture, volume 6 page 39***Henry Plantagenet** (king of England): *see in index* Henry II**Henson, Jim** (U.S. puppeteer)MAIN ARTICLE *volume 6 page 40, picture, volume 6 page 40***Henson, Matthew** (U.S. explorer)MAIN ARTICLE *volume 6 page 41, picture, volume 6 page 41*

MORE TO EXPLORE

Arctic Ocean *volume 1 page 173*exploration *volume 4 page 174*Peary *volume 10 page 48*polar exploration *volume 10 page 110*
at the North Pole *picture, volume 10 page 110***hepatitis** (liver inflammation)MAIN ARTICLE *volume 6 page 42*

MORE TO EXPLORE

hepatitis B virus *picture, volume 6 page 42*liver *volume 7 page 167***Hephaestus** (Greek god)MAIN ARTICLE *volume 6 page 42, picture, volume 6 page 43*

MORE TO EXPLORE

Aphrodite *volume 1 page 149*Hera *volume 6 page 43*Pandora *volume 10 page 26***heptathlon** (athletic competition)track and field *volume 13 page 87***Hera** (Greek goddess)MAIN ARTICLE *volume 6 page 43, picture, volume 6 page 44*

MORE TO EXPLORE

Heracles *volume 6 page 44*Zeus *volume 15 page 104*

Heracles (Greek mythology)

MAIN ARTICLE *volume 6 page 44*, *picture*, *volume 6 page 45*

MORE TO EXPLORE

Atlas *volume 1 page 222*

Heracles, Labors of (classical mythology)

Heracles *volume 6 page 44*

herb (plant form and food)

MAIN ARTICLE *volume 6 page 45*, *picture*, *volume 6 page 46*

MORE TO EXPLORE

vegetable *volume 14 page 60*

herbicide (chemical)

pollution *volume 10 page 118*

herbivore (plant-eating animal)

dinosaur *volume 4 page 51*

mouth structure *picture*, *volume 4 page 51*

mammal *volume 8 page 37*

Hercules (classical mythology): *see in index* Heracles**Hercules, Labors of** (classical mythology): *see in index* Heracles, Labors of**herd** (biology)

elephant *volume 4 page 124*

herding breed (dogs)

dog *table*, *volume 4 page 62*

heredity (transmission of biological traits)

aging *volume 1 page 47*

genes and eye color *picture*, *volume 5 page 94*

human disease *volume 4 page 57*

Herero (people)

Namibia *volume 9 page 7*

Hermes (Greek god)

MAIN ARTICLE *volume 6 page 46*, *picture*, *volume 6 page 46*

MORE TO EXPLORE

Apollo *volume 1 page 150*

Perseus *volume 10 page 60*

hermit (monk)

monk *volume 8 page 165*

Hermitage (museum in St. Petersburg, Russia) *picture*, *volume 1 page 196*
Saint Petersburg *volume 12 page 16***hermit crab** (animal) *picture*, *volume 3 page 225***heron** (bird)

MAIN ARTICLE *volume 6 page 47*, *picture*, *volume 6 page 47*

Herophilus (Greek physician)

anatomy *volume 1 page 115*

Herrerasaurus (dinosaur)

dinosaurs in scale *picture*, *volume 4 page 53*

Herschel, Sir William (German-born British astronomer)

Uranus *volume 14 page 39*

Hesperides (Greek mythology)

Atlas *volume 1 page 222*

Hestia (Greek goddess)

MAIN ARTICLE *volume 6 page 48*, *picture*, *volume 6 page 48*

Hezbollah (Lebanese organization)

Lebanon *volume 7 page 121*

Hiawatha (legendary Native American leader)

MAIN ARTICLE *volume 6 page 49*, *picture*, *volume 6 page 49*

MORE TO EXPLORE

Iroquois *volume 6 page 160*

hibernation (animal behavior)

MAIN ARTICLE *volume 6 page 49*

MORE TO EXPLORE

amphibians *volume 1 page 110*

toad *volume 13 page 72*

animal migration *volume 8 page 125*

mammal *volume 8 page 36*

bears *volume 2 page 42*

dormouse *picture*, *volume 6 page 50*

hedgehog *volume 6 page 34*

prairie dog *volume 10 page 143*

reptile *volume 11 page 51*

snake *volume 12 page 114*

hiccup (physiology)

respiratory system *volume 11 page 56*

hickory (tree and nut)

MAIN ARTICLE *volume 6 page 50*, *picture*, *volume 6 page 51*

Hidalgo y Costilla, Miguel (Mexican leader and priest)

MAIN ARTICLE *volume 6 page 51*, *picture*, *volume 6 page 51*

Hidatsa (Native American people)

MAIN ARTICLE *volume 6 page 52*

MORE TO EXPLORE

Arikara *volume 1 page 177*

bison robe *picture*, *volume 6 page 52*

Crow *volume 3 page 221*

Mandan *volume 8 page 40*

Sacagawea *volume 12 page 4*

“Hidden Jungle” (zoo exhibit in San Diego, California, U.S.) *picture*, *volume 15 page 107***Hidden Lake** (lake in Glacier National Park, Montana, U.S.) *picture*, *volume 8 page 174***hieroglyphics** (picture writing)

MAIN ARTICLE *volume 6 page 53*

MORE TO EXPLORE

ancient Egypt *volume 4 page 113*, *picture*, *volume 4 page 113*

Maya *volume 8 page 82*

Nefertari's tomb *picture*, *volume 6 page 53*

numbers and number systems *volume 9 page 106*

writing *volume 15 page 77*

high bar (gymnastics): *see in index* horizontal bar**high blood pressure** (medical disorder): *see in index* hypertension**High Commissioner for Refugees**

(international humanitarian agency): *see in index* United Nations High Commissioner for Refugees, Office of the

high definition TV (electronics)

television *volume 13 page 40*

high-density lipoprotein (biochemistry)

cholesterol *volume 3 page 111*

higher education

education *volume 4 page 106*

high jump (athletics)

track and field *volume 13 page 86*, *picture*, *volume 13 page 85*

Highland (breed of cattle) *picture*, *volume 8 page 36***Highlands** (region in Scotland, United Kingdom)

Scotland *volume 12 page 52*

high school: *see in index* secondary education**high-speed train**

London *picture*, *volume 11 page 20*

high tide (oceanic movement)

tides *volume 13 page 63, picture, volume 13 page 64*

Highveld (region in Africa)

Zimbabwe *volume 15 page 105*

highway (transportation): *see in index* road**Higinbotham, William A.** (U.S. electronic game designer)

electronic games *volume 4 page 122*

hijrah (Islam)

Muhammad *volume 8 page 203*

hiking (recreation)

forest in Seychelles *picture, volume 5 page 54*

mountain hiking *picture, volume 4 page 172, picture, volume 8 page 195*

Hill, Sir Rowland (English administrator and educator)

stamp *volume 12 page 177*

Hillary, Edmund (New Zealand explorer)

MAIN ARTICLE *volume 6 page 54, picture, volume 6 page 54*

MORE TO EXPLORE

Himalayas *volume 6 page 55*

Mount Everest *volume 4 page 167*

hillbilly music: *see in index* country music**Hill Complex** (ancient structure, Great Zimbabwe, Zimbabwe)

Great Zimbabwe *volume 5 page 150*

Hilton Head Island (island in South Carolina, U.S.)

South Carolina *volume 12 page 148*

Himalayas (mountain range in central Asia)

MAIN ARTICLE *volume 6 page 54*

MORE TO EXPLORE

Mount Everest *volume 4 page 167*

Nepal *picture, volume 9 page 31*

hindbrain (anatomy)

brain *volume 2 page 122, picture, volume 2 page 122*

hind leg (anatomy)

leg *volume 7 page 123*

Hindu calendar (religion)

calendar *volume 3 page 10*

Hinduism (religion)

MAIN ARTICLE *volume 6 page 55*

MORE TO EXPLORE

Angkor Wat *volume 1 page 120, picture, volume 1 page 121*

history

abacus *volume 1 page 7*

hospital *volume 6 page 88*

Mughal Empire *volume 8 page 202*

temple *volume 13 page 42*

India *volume 6 page 123, volume 10 page 13*

major world religions *table, volume 11 page 43*

practices and customs

cattle *volume 3 page 61*

Ganges River *volume 5 page 86*

Holi festival celebration *picture, volume 6 page 57*

monk *volume 8 page 166*

pilgrimage *volume 10 page 85, picture, volume 10 page 85*

saint *volume 12 page 9*

Yoga *volume 15 page 93*

Siva shrine *picture, volume 6 page 56*

Hindustani (ethnic group in Suriname)

Suriname *volume 12 page 208*

Hinton, S.E. (U.S. author)

MAIN ARTICLE *volume 6 page 58, picture, volume 6 page 58*

hip (anatomy)

dinosaur *volume 4 page 50, picture, volume 4 page 50*

hip joint replacement *picture, volume 13 page 91*

hip-hop (music and culture)

MAIN ARTICLE *volume 6 page 58, picture, volume 6 page 59*

MORE TO EXPLORE

rap *volume 11 page 26*

hip joint (anatomy): *see in index* hip**hippo** (mammal): *see in index* hippopotamus**Hippocrates** (Greek physician)

medicine *volume 8 page 93*

hippopotamus (mammal)

MAIN ARTICLE *volume 6 page 59, picture, volume 6 page 59*

MORE TO EXPLORE

adaptation *picture, volume 1 page 27*

Hiroshima (city in Japan)

MAIN ARTICLE *volume 6 page 60, picture, volume 6 page 60*

MORE TO EXPLORE

Truman *volume 13 page 101*

World War II *volume 15 page 70*

Hispanic American (people)

MAIN ARTICLE *volume 6 page 60*

MORE TO EXPLORE

Massachusetts *volume 8 page 71*

Nevada *volume 9 page 40*

New Hampshire *volume 9 page 47*

New Mexico *volume 9 page 51*

New York *volume 9 page 58*

Oregon *volume 9 page 147*

Rhode Island *volume 11 page 60*

Utah *volume 14 page 44*

Virginia *volume 14 page 95*

Hispaniola (island in the West Indies)

Columbus *volume 3 page 163*

Dominican Republic *volume 4 page 66*

Haiti *volume 6 page 9*

histamine (biochemical compound)

allergy *volume 1 page 84*

drug *volume 4 page 78*

historian: *see in index* history**historical fiction** (literature and theater)

Shakespeare *volume 12 page 75*

historiography: *see in index* history**history**

MAIN ARTICLE *volume 6 page 63*

MORE TO EXPLORE

page from "Ecclesiastical History" by Bede, c. 732 AD *picture, volume 6 page 64*

history museum

museum *volume 8 page 211*

hit (baseball)

baseball *volume 2 page 32*

Hitler, Adolf (dictator of Germany)

MAIN ARTICLE *volume 6 page 64, picture, volume 6 page 64*

MORE TO EXPLORE

fascism *volume 5 page 8*

Germany *volume 5 page 106*

Holocaust *volume 6 page 71*

Judaism *volume 7 page 39*

Nazi Party *volume 9 page 26*

post-World War I *volume 15 page 65*

- Storm Troopers *picture, volume 9 page 26*
 World War II *volume 15 page 65*
- Hittite** (people)
 technology and invention *volume 13 page 25*
- HIV** (virus): *see in index* human immunodeficiency virus
- Hoban, James** (Irish-born U.S. architect)
 White House *volume 15 page 42*
- Hobart** (state capital of Tasmania, Australia)
 Tasmania *volume 13 page 19*
- “Hobbit, The”** (work by Tolkien)
 Tolkien *volume 13 page 77*
- hobby** (personal interest activity)
 MAIN ARTICLE *volume 6 page 65*
- Ho Chi Minh** (president of North Vietnam)
 MAIN ARTICLE *volume 6 page 66, picture, volume 6 page 66*
 MORE TO EXPLORE
 Vietnam War *volume 14 page 86*
- Ho Chi Minh City** (city in Vietnam)
 Vietnam War *volume 14 page 88*
- Ho-Chunk** (Native American people): *see in index* Winnebago
- hockey** (sport): *see in index* hockey, ice
- hockey, ice** (sport)
 MAIN ARTICLE *volume 6 page 67, picture, volume 6 page 67, picture, volume 6 page 68*
 MORE TO EXPLORE
 Gretzky *picture, volume 5 page 161*
 types of skates *picture, volume 6 page 109*
- hockey rink** (sports)
 ice hockey *volume 6 page 67*
 international ice hockey rink *picture, volume 6 page 68*
- hockey skate** (sports equipment)
 ice skating *volume 6 page 109*
 types of skates *picture, volume 6 page 109*
- hockey stick** (ice hockey)
 ice hockey *volume 6 page 68*
- hog** (mammal)
 pig *volume 10 page 83*
- hogan** (Navajo dwelling)
 Navajo *volume 9 page 23*
- Hohenstaufen family** (German dynasty)
 Holy Roman Empire *volume 6 page 75*
- Hohokam culture** (prehistoric Native American culture)
 MAIN ARTICLE *volume 6 page 69*
 MORE TO EXPLORE
 Hohokam rock carvings *picture, volume 6 page 69*
 Phoenix *volume 10 page 75*
- Holbein, Hans, the Younger** (German painter)
 Henry VIII *picture, volume 6 page 39*
- hold** (wrestling)
 wrestling *volume 15 page 74*
- Holi** (Hindu festival)
 children celebrate in India *picture, volume 6 page 57*
- holiday**
 MAIN ARTICLE *volume 5 page 13*
- Holiday, Billie** (U.S. jazz singer)
 jazz *volume 7 page 16*
- Holland** (country in Europe): *see in index* Netherlands, The
- Holland** (historical region in The Netherlands)
 The Hague *volume 6 page 6*
- holly** (tree and shrub)
 MAIN ARTICLE *volume 6 page 70, picture, volume 6 page 70*
- Hollywood** (district in Los Angeles, California, U.S.)
 Los Angeles *volume 7 page 178*
- Holocaust** (European history)
 MAIN ARTICLE *volume 6 page 71*
 MORE TO EXPLORE
 Europe *volume 4 page 163*
 Frank *volume 5 page 62*
 Germany *volume 5 page 107*
 Hitler *volume 6 page 64*
 human rights *volume 6 page 97*
 Judaism *volume 7 page 39*
 Jewish identification badges *picture, volume 6 page 71*
 Poland *volume 10 page 109*
 Majdanek Concentration Camp *picture, volume 6 page 72*
 Warsaw *volume 15 page 14*
- Vilnius *volume 14 page 91*
 World War II *volume 15 page 65*
- hologram** (three-dimensional photograph)
 MAIN ARTICLE *volume 6 page 72, picture, volume 6 page 73*
- holography** (photographic process): *see in index* hologram
- Holy Communion** (Christianity): *see in index* Communion
- Holy Family, Church of the** (church in Barcelona, Spain) *picture, volume 12 page 154*
- Holy Ghost** (Christianity): *see in index* Holy Spirit
- Holy Grail** (legendary cup)
 Arthurian legend *volume 1 page 194*
- Holy Land**: *see in index* Palestine
- Holy Roman Empire** (historic empire in Europe)
 MAIN ARTICLE *volume 6 page 73*
 MORE TO EXPLORE
 Charlemagne *volume 3 page 81*
 Franks *volume 5 page 61*
 Germany *volume 5 page 106*
 Hapsburgs *volume 6 page 15*
 Liechtenstein *volume 7 page 147*
 Vaduz *volume 14 page 50*
 Louis I crowning *picture, volume 6 page 74*
 Rudolf I tomb statue *picture, volume 6 page 74*
- Holy See** (Roman Catholic government): *see in index* Vatican City
- Holy Sepulchre, Church of the** (church in Jerusalem)
 Jerusalem *volume 7 page 21*
- Holy Spirit** (Christianity)
 Christianity *volume 3 page 112*
- Holy Thursday** (Christian holy day)
 Easter *volume 4 page 93*
- Holy Trinity** (Christian doctrine): *see in index* Trinity
- Holy Week** (Christianity)
 Easter *volume 4 page 93*
- home base** (baseball): *see in index* home plate

Home Insurance Company Building

(building in Chicago, Illinois, U.S.)

architecture *volume 1 page 171*skyscraper *volume 12 page 104***Homeland Security, Department of**

(U.S. government agency)

U.S. government executive departments
*table, volume 14 page 35***homeopathy** (system of medical treatment)MAIN ARTICLE *volume 6 page 75*

MORE TO EXPLORE

medicines *picture, volume 6 page 75***home plate** (baseball)baseball *volume 2 page 30, picture, volume 2 page 31***Homer** (Greek poet)MAIN ARTICLE *volume 6 page 76, picture, volume 6 page 76***home run** (baseball)Ruth *volume 11 page 109***hominin** (anthropology)evolution *picture, volume 6 page 94*human origins *volume 6 page 94*prehistoric life *volume 10 page 146***Homo erectus** (hominid)human origins *volume 6 page 95, picture, volume 6 page 93*skull comparison with other homonids
*picture, volume 6 page 95***Homo habilis** (hominid)human lineage *picture, volume 6 page 93*
human origins *volume 6 page 95***Homo heidelbergensis** (hominid)human origins *volume 6 page 95***Homo neanderthalensis** (hominid): *see in index* Neanderthal**Homo sapiens**: *see in index* human being**Honduras** (country in Central America)MAIN ARTICLE *volume 6 page 77*

MORE TO EXPLORE

Tegucigalpa *picture, volume 13 page 32***honey** (food product)insects *volume 6 page 140***honey bear** (*Helarctos malayanus*): *see in index* sun bear**honeybee** (insect) *picture, volume 6 page 138*bee *volume 2 page 45, picture, volume 2 page 46*nest *volume 9 page 37***honeycomb** (biology) *picture, volume 6 page 138*nest *volume 9 page 37***honeydew** (fruit)melon *picture, volume 8 page 97***Honeymoon Island** (island in Florida, U.S.)children on beach *picture, volume 5 page 35***Hong Kong** (administrative region in China)MAIN ARTICLE *volume 6 page 78, picture, volume 6 page 78*

MORE TO EXPLORE

ceremony marking return of colony to China *picture, volume 4 page 132*Daoist worshippers *picture, volume 4 page 15*homeopathic medicines *picture, volume 6 page 75*SARS *picture, volume 12 page 38***Honiara** (capital city of the Solomon Islands)MAIN ARTICLE *volume 6 page 78*

MORE TO EXPLORE

dancers in traditional clothing *picture, volume 6 page 79*Solomon Islands *volume 12 page 129***honky-tonk** (music)country music *volume 3 page 208***Honolulu** (state capital of Hawaii, U.S.)MAIN ARTICLE *volume 6 page 79, picture, volume 6 page 79*

MORE TO EXPLORE

Oceania *volume 9 page 121***Honshu** (island in Japan)Japan *volume 7 page 12***Hood, Mount** (mountain in Oregon, U.S.)Oregon *volume 9 page 147***hooded merganser** (bird)bill structure and eating habits *picture, volume 2 page 77***hoof** (animal anatomy)MAIN ARTICLE *volume 6 page 80, picture, volume 6 page 80*

MORE TO EXPLORE

horse *volume 6 page 86***hoofed animal**: *see in index* antelope; bison; buffalo; camel; cattle; deer; donkey; elk; giraffe; goat; hoof; horse; llama; moose; musk-ox; pig; reindeer; sheep; wapiti; yak; zebra**Hook, Captain** (fictional character): *see in index* Captain Hook**hook and ladder truck**: *see in index* ladder truck**Hoosier State** (state in the U.S.): *see in index* Indiana**Hoover, Herbert** (president of the U.S.)
MAIN ARTICLE *volume 6 page 81, picture, volume 6 page 81*

MORE TO EXPLORE

Great Depression *volume 5 page 147*
timeline *volume 6 page 81***Hoover Dam** (dam in the U.S.) *picture, volume 4 page 9*Hoover *volume 6 page 81*Nevada *volume 9 page 41***hooves** (animal anatomy): *see in index* hoof**hop, step, and jump** (athletics): *see in index* triple jump**Hopewell culture** (prehistoric North American culture)MAIN ARTICLE *volume 6 page 82*

MORE TO EXPLORE

copper artwork *picture, volume 6 page 83*mound builders *volume 8 page 194***Hopi** (Native American people)MAIN ARTICLE *volume 6 page 83*

MORE TO EXPLORE

Hopi dancers *picture, volume 6 page 83***horizontal bar** (gymnastics)gymnastics *volume 5 page 174, picture, volume 5 page 175***horizontal stabilizer** (aircraft part)
airplane *volume 1 page 54***hormone** (biochemistry)MAIN ARTICLE *volume 6 page 84, picture, volume 6 page 84*

MORE TO EXPLORE

acne *volume 1 page 19*
 endocrine system *volume 4 page 134*
 pancreas *volume 10 page 24*

horn (animal anatomy)

MAIN ARTICLE *volume 6 page 85, picture, volume 6 page 85*

MORE TO EXPLORE

antelope *volume 1 page 139*
 sheep *volume 12 page 79*
 Swaledale *picture, volume 12 page 79*

horn (musical instrument)

wind instruments *picture, volume 8 page 217*

hornet (insect)

wasp *volume 15 page 21*

horse (mammal)

MAIN ARTICLE *volume 6 page 85*

MORE TO EXPLORE

images
 activities
 Kentucky Derby *picture, volume 6 page 87*
 war *picture, volume 15 page 9*
 anatomy
 front limb *picture, volume 1 page 182*
 hoof *picture, volume 6 page 80*
 leg *picture, volume 7 page 123*
 mane *picture, volume 6 page 7*
 breeds
 pony *picture, volume 6 page 86*
 Przewalski's horse *picture, volume 6 page 86*
 evolution *picture, volume 4 page 170*
 knee *volume 7 page 74*
 Native Americans *volume 9 page 19*
 Comanche *volume 3 page 164*
 Gros Ventre *picture, volume 5 page 163*
 Kaw *volume 7 page 51*
 technology and invention *volume 13 page 26*

horse collar (harness)

technology and invention *volume 13 page 26*

horseshoe

hoof *volume 6 page 80*

Horus (Egyptian god)

Isis and Osiris *volume 6 page 163*

hospital

MAIN ARTICLE *volume 6 page 87*

MORE TO EXPLORE

child with newborn sister *picture, volume 6 page 88*
 temporary hospital, 1918-19 flu epidemic *picture, volume 6 page 136*

host (parasitism)

parasite *volume 10 page 32*

hot-air balloon (aircraft) *picture, volume 2 page 16***hot desert**

desert *volume 4 page 40*

hot pepper (plant)

pepper *volume 10 page 59*

hot spot (geology and thermodynamics)

volcano *volume 14 page 100*

hot-spot volcano (geology)

volcano *volume 14 page 101*

hot spring (place where water naturally flows from the ground): *see in index*
spring**Houdini, Harry** (U.S. magician)

magic *volume 8 page 17*

hound (dog group)

dog *table, volume 4 page 62*

Houphouët-Boigny, Félix (president of Côte d'Ivoire)

Yamoussoukro *volume 15 page 85*

hour (unit of time)

sundial *volume 12 page 204*
 time *volume 13 page 67*

hour line (time keeping)

sundial *volume 12 page 204, picture, volume 12 page 204*

house (dwelling)

ancient Egypt *volume 4 page 112*

images

Africa

Benin *picture, volume 2 page 60*
 Burkina Faso *picture, volume 2 page 151*
 Ghana *picture, volume 5 page 110*
 Lesotho *picture, volume 7 page 134*
 Mali *picture, volume 8 page 32*
 Mauritania *picture, volume 8 page 79*
 Niger *picture, volume 9 page 67*
 Asia and Oceania
 Cambodia *picture, volume 10 page 74*
 Mongolia *picture, volume 8 page 164*

Nepal *picture, volume 9 page 31*

Papua New Guinea *picture, volume 10 page 131*

Samoa *picture, volume 12 page 24*

Vietnam *picture, volume 14 page 84*

Yemen *picture, volume 15 page 90*

Europe

Belgium *picture, volume 2 page 55*

British Iron Age *picture, volume 6 page 159*

France *picture, volume 5 page 58*

Germany *picture, volume 5 page 105*

Greece *picture, volume 5 page 152*

Italy *picture, volume 14 page 65*

Russia *picture, volume 11 page 105, picture, volume 14 page 12*

The Netherlands *picture, volume 1 page 111*

North America and West Indies

Native Americans *picture, volume 3 page 106, picture, volume 6 page 160, picture, volume 8 page 40, picture, volume 9 page 12, picture, volume 10 page 164, picture, volume 15 page 85*

Trinidad and Tobago *picture, volume 10 page 132*

United States *picture, volume 3 page 160, picture, volume 10 page 160, picture, volume 11 page 64*

pioneer life *volume 10 page 88, picture, volume 10 page 88*

House, speaker of the (U.S. government): *see in index* speaker of the House

house cat (mammal): *see in index* cat

housefly (insect) *picture, volume 5 page 39*

fly *volume 5 page 39*

house mouse (rodent) *picture, volume 8 page 196*

mouse *volume 8 page 196*

House of: *see in index* under the specific part of the name, for example, Lords, House of except as found below

House of Habsburg (European dynasty): *see in index* Hapsburgs

house sparrow (bird)

sparrow *volume 12 page 159*

Housing and Urban Development, Department of (U.S. government agency)

U.S. government executive departments
table, volume 14 page 35

Houston (city in Texas, U.S.)

MAIN ARTICLE *volume 6 page 88*

Houston, Sam (U.S. lawyer and politician)

Houston *volume 6 page 89*

Houston Ship Channel (waterway in southwestern U.S.)

Houston *volume 6 page 89*

Howard, Catherine (queen of England):

see in index Catherine Howard

howler monkey (primate) *picture, volume 8 page 167*

monkey *volume 8 page 168*

“How the Grinch Stole Christmas”

(book by Dr. Seuss)

Dr. Seuss *volume 12 page 73*

Hoxha, Enver (prime minister of Albania)

Albania *volume 1 page 66*

Hradcany, castle of (castle in Prague, Czech Republic)

Prague *volume 10 page 142*

Hsiung-nu (people): *see in index* Hun

HTML (computer programming language): *see in index* hypertext markup language

Huang He (river in China)

MAIN ARTICLE *volume 6 page 89*

Hubble Space Telescope (astronomy)

astronomy *volume 1 page 215*

images

black hole *picture, volume 2 page 87*

Small Magellanic Cloud *picture, volume 14 page 37*

satellite *volume 12 page 41*

telescope *volume 13 page 39*

Hudson, Henry (English navigator and explorer)

exploration of the Americas *volume 1 page 103*

Hudson Bay *volume 6 page 90*

New York *volume 9 page 59*

Ontario *volume 9 page 140*

Wappinger *volume 15 page 8*

Hudson Bay (sea in Canada)

MAIN ARTICLE *volume 6 page 90*

MORE TO EXPLORE

polar bear on Hudson Bay ice *picture, volume 8 page 45*

Hudson's Bay Company (Canadian company)

MAIN ARTICLE *volume 6 page 90*

MORE TO EXPLORE

Alberta *volume 1 page 70*

British Columbia *volume 2 page 133*

fur trade *volume 5 page 76*

Hudson Bay *volume 6 page 90*

Idaho *volume 6 page 112*

Manitoba *volume 8 page 45*

Northwest Territories *volume 9 page 96*

Nunavut *volume 9 page 109*

Saskatchewan *volume 12 page 40*

station *picture, volume 6 page 90*

Yukon *volume 15 page 98*

Huerta, Victoriano (president of Mexico)

Villa *volume 14 page 90*

Zapata *volume 15 page 102*

Hughes, Langston (U.S. poet)

MAIN ARTICLE *volume 6 page 91, picture, volume 6 page 91*

“Hugo” (hurricane): *see in index* Hurricane Hugo

Huguenot (French Protestantism)

MAIN ARTICLE *volume 6 page 92*

MORE TO EXPLORE

Huguenots meeting secretly *picture, volume 6 page 92*

hull (watercraft part)

boat *volume 2 page 97, picture, volume 2 page 97*

ship *volume 12 page 81*

Hull House (social agency in Chicago, Illinois, U.S.)

Addams *volume 1 page 27*

human being

Africa *volume 1 page 41*

aging *volume 1 page 47*

American dog tick *picture, volume 13 page 63*

climate *volume 3 page 138*

cosmetics: *see in index* cosmetic

endangered species *volume 4 page 134*

human origins *volume 6 page 95*

images

human evolution *picture, volume 6 page 93*

human skull evolution *picture, volume 6 page 95*

primate *picture, volume 10 page 149*

vertebrate embryo development *picture, volume 5 page 109*

plant *volume 10 page 96*

prehistoric life *volume 10 page 146*

speech *volume 12 page 162, picture, volume 12 page 162*

human body

adolescence *volume 1 page 31*

anatomy *picture, volume 1 page 115*

appendix *volume 1 page 152*

arm *volume 1 page 182, picture, volume 1 page 182*

skeletal muscles *picture, volume 8 page 208*

brain *volume 2 page 122, picture, volume 2 page 122*

ear *volume 4 page 86, picture, volume 4 page 87*

eye *volume 4 page 175, picture, volume 4 page 175*

foot *volume 5 page 47, picture, volume 5 page 47*

hair *volume 6 page 7*

hand *picture, volume 6 page 12*

human skeletal system *picture, volume 12 page 96*

knee *picture, volume 7 page 73*

leg *picture, volume 7 page 123*

knee joint in cross section *picture, volume 12 page 97*

liver *volume 7 page 166, picture, volume 7 page 167, picture, volume 7 page 167*

lung *picture, volume 7 page 184*

mouth *picture, volume 8 page 197*

nail *volume 9 page 4, picture, volume 9 page 4*

nose *volume 9 page 99*

skeletal muscles *picture, volume 8 page 207*

physiology

allergy *volume 1 page 84*

cardiovascular system *volume 3 page 38*

circulatory system *volume 3 page 119*

digestive system *volume 4 page 47, picture, volume 4 page 47*

endocrine system *volume 4 page 134, picture, volume 4 page 135*

hormone *volume 6 page 84*

immune system *volume 6 page 119*
 lymphatic system *volume 7 page 189*,
picture, volume 7 page 189
 muscles *volume 8 page 207*
 nervous system *picture, volume 9*
page 34
 radiation *volume 11 page 17*
 reproductive system *volume 11*
page 46
 respiratory system *volume 11*
page 54
 skeletal system *volume 12 page 95*
 urinary system *volume 14 page 40*

human disease: *see in index* disease

human equality: *see in index* equal rights

human evolution

human origins *volume 6 page 93*

human geography (science)

geography *volume 5 page 96*

human illness: *see in index* disease

human immunodeficiency virus

AIDS *volume 1 page 49*

Ashe *volume 1 page 199*

Johnson *volume 7 page 30*

humanism

Renaissance *volume 11 page 44*

human migration: *see in index* migration

human origins

MAIN ARTICLE *volume 6 page 92*

MORE TO EXPLORE

Australopithecine footprints *picture*,
volume 6 page 95

evolution *picture, volume 6 page 94*

human lineage *picture, volume 6*
page 93

Neanderthal fossil skeleton *picture, vol-*
ume 6 page 93

skull comparison with other homonids
picture, volume 6 page 95

human population: *see in index* popula-
 tion

human reproductive system: *see in index*
 reproductive system

human rights

MAIN ARTICLE *volume 6 page 96*

MORE TO EXPLORE

bill of rights *volume 2 page 70*

civil rights *volume 3 page 128*

images

International Human Rights Day
picture, volume 6 page 96

Universal Declaration of Human
 Rights *picture, volume 6 page 98*

Zimbabwe march *picture, volume 6*
page 97

human sacrifice

Maya *volume 8 page 82*

human sickness: *see in index* disease

Humayun (Mughal emperor)

tomb in Delhi, India *picture, volume 8*
page 202

humerus (bone)

arm *volume 1 page 182, picture, vol-*
ume 1 page 182

leg *volume 7 page 123*

humidity (atmosphere)

weather *volume 15 page 27*

hummingbird (bird)

MAIN ARTICLE *volume 6 page 98, picture*,
volume 6 page 98

humpback salmon (fish): *see in index*
 pink salmon

humpback whale (mammal) *picture*,

volume 15 page 36

whale species *picture, volume 15 page 37*

humus (soil component)

soil *volume 12 page 125*

Hun (historic Asian people)

MAIN ARTICLE *volume 6 page 99, picture*,
volume 6 page 99

MORE TO EXPLORE

archery *volume 1 page 166*

Hundred Days (French history)

Napoleon I *volume 9 page 9*

Hundred Years' War (European history)

France *volume 5 page 59*

Hungary (country in Europe)

MAIN ARTICLE *volume 6 page 100*

MORE TO EXPLORE

folk musician *picture, volume 5 page 41*
 geography

Budapest *picture, volume 2 page 141*,
picture, volume 6 page 100

Danube River *picture, volume 6*
page 101

history

Bratislava *volume 2 page 124*

Hapsburgs *volume 6 page 16*

timeline *volume 6 page 100*

Hunsdon's Men (English theater com-
 pany): *see in index* Lord Chamberlain's
 Men

hunting and gathering society (anthro- pology)

nomad *volume 9 page 76*

Stone Age *volume 12 page 189*

hunting dog (mammal)

dog breeds *table, volume 4 page 62*

hunting leopard (mammal): *see in index* cheetah

hurdling (athletics) *picture, volume 13* *page 86*

track and field *volume 13 page 86, pic-*
ture, volume 13 page 85

Huron (Native American people): *see in*
index Wyandot

Huron, Lake (lake in North America)

MAIN ARTICLE *volume 6 page 103*

MORE TO EXPLORE

Great Lakes *volume 5 page 147, picture*,
volume 5 page 147

Huron-Wendat (Native American
 people): *see in index* Wyandot

hurricane (weather) *picture, volume 1* *page 221*

Atlantic Ocean *volume 1 page 221*

storm *volume 12 page 192*

Hurricane Hugo (storm)

South Carolina *volume 12 page 148*

Hurricane Katrina (storm)

Louisiana *volume 7 page 181*

satellite images *picture, volume 15*
page 28

Husayni, Muhammad 'Abd ar-Ra'uf
al-Qudwah al- (Palestinian leader): *see*
in index Arafat, Yasir

husky, Siberian (breed of dog): *see in*
index Siberian husky

Hussein (king of Jordan)

peace agreement *picture, volume 10*
page 19

Hussein, Saddam (president of Iraq): *see*
in index Saddam Hussein

Hutu (African people)

Burundi *volume 2 page 153*

Kigali *volume 7 page 64*
 Rwanda *volume 11 page 110*

Huygens (spacecraft)
 Saturn *volume 12 page 42*

Hyatt, John Wesley (U.S. inventor)
 plastic *volume 10 page 97*

hybrid bicycle (vehicle)
 bicycle *volume 2 page 69*

hybrid car *picture, volume 1 page 237*

hydra (water-dwelling animal)
 MAIN ARTICLE *volume 6 page 103, picture, volume 6 page 104*

Hydra (moon of Pluto)
 Pluto *volume 10 page 102*

hydroelectric power
 dam *volume 4 page 9*
 Itaipú Dam *picture, volume 10 page 31*

hydrogen (chemical element)
 balloon *volume 2 page 15*
 Neptune *volume 9 page 33*
 star *volume 12 page 179*
 sun *volume 12 page 203*
 water molecule *picture, volume 8 page 155*

hydrogen bomb (fusion device): *see in index* thermonuclear bomb

hydroponics (horticulture): *see in index* aquaculture

hydrosphere (Earth science)
 environment *volume 4 page 144*

hyena (mammal)
 MAIN ARTICLE *volume 6 page 104, picture, volume 6 page 104*

Hyksos (ancient Asian people)
 ancient Egypt *volume 4 page 114*

hyperactivity (psychology)
 sugar *volume 12 page 202*

hyperlinking (computer science): *see in index* hypertext

hypermetropia (visual disorder): *see in index* farsightedness

hyperopia (visual disorder): *see in index* farsightedness

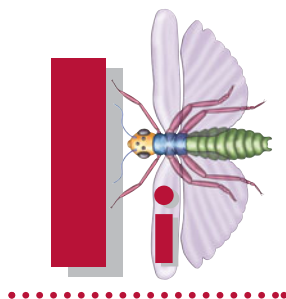
hypertension (medical disorder)
 cardiovascular system *volume 3 page 40*

hypertext (computer science)
 Internet *volume 6 page 142*

hypertext markup language (computer programming language)
 Internet *volume 6 page 142*

hypothalamus (anatomy)
 endocrine system *volume 4 page 135, picture, volume 4 page 135*

hypothesis
 science *volume 12 page 50*



I/O device (computer technology): *see in index* input/output device

IAAF (international sports organization): *see in index* International Association of Athletics Federations

Iapetus (Greek mythology)
 Atlas *volume 1 page 222*

ibis (bird)
 MAIN ARTICLE *volume 6 page 106, picture, volume 6 page 106*
 MORE TO EXPLORE
 white ibis *picture, volume 14 page 26*

Ibn Sa'ud (king of Saudi Arabia)
 Saudi Arabia *volume 12 page 44*

Ibo (people): *see in index* Igbo

Ibsen, Henrik (Norwegian playwright and poet)
 drama *volume 4 page 74*

IC (electronics): *see in index* integrated circuit

Icarus (Greek mythology)
 Daedalus *volume 4 page 4, picture, volume 4 page 4*

ice (solid water)
 crystal *volume 3 page 226, picture, volume 3 page 226*
 states of matter *picture, volume 8 page 78*
 water *volume 15 page 22*

ice age (geology)
 MAIN ARTICLE *volume 6 page 106*
 MORE TO EXPLORE
 prehistoric life *volume 10 page 146*

iceberg
 MAIN ARTICLE *volume 6 page 107, picture, volume 6 page 107*
 MORE TO EXPLORE
 Arctic Ocean *picture, volume 1 page 173*
 Titanic *volume 13 page 70*

ice cave (geology)
 cave *volume 3 page 63*

ice crystal (physics)
 rain *volume 11 page 22*

ice dancing (sport)
 ice skating *volume 6 page 110*

ice fishing
 Nunavut *picture, volume 9 page 109*

Iceland (island country in the North Atlantic Ocean)
 MAIN ARTICLE *volume 6 page 108*
 MORE TO EXPLORE
 canyon *picture, volume 3 page 32*
 Crater Viti *picture, volume 6 page 108*
 volcano *volume 14 page 100*

Icelandic eruption (volcanic activity)
 picture, *volume 14 page 102*

ice rink (ice skating facility)
 ice skating *volume 6 page 110*

ice skate (sports equipment)
 different types of skates *picture, volume 6 page 109*
 ice skating *volume 6 page 109*

ice skating (hobby and sport)
 MAIN ARTICLE *volume 6 page 109*
 MORE TO EXPLORE
 figure skater dancing *picture, volume 6 page 110*
 skating *volume 12 page 94*
 speed skater *picture, volume 6 page 110*
 types of skates *picture, volume 6 page 109*

Ice-T (U.S. rapper and actor)
 rap *volume 11 page 27*

Ichán-Kala (royal court in Khiva, Uzbekistan) *picture, volume 14 page 47*

ICJ (United Nations): *see in index* International Court of Justice

ICRC (Swiss aid organization): *see in index* International Committee of the Red Cross

ICU (hospital area): *see in index* intensive care unit

Idaho (state in the U.S.)

MAIN ARTICLE *volume 6 page 111*

MORE TO EXPLORE

geography

Bitterroot Mountains *picture, volume 6 page 112*

irrigated field *picture, volume 6 page 161*

Saint Joe National Forest *picture, volume 9 page 44*

State Capitol *picture, volume 2 page 100*

Idaho Territory (historical territory in the U.S.)

Idaho *volume 6 page 112*

identical twin *picture, volume 5 page 94*
genetics *volume 5 page 94*

Ides of March (Roman history)

Caesar *volume 3 page 8*

Iditarod (sled dog race in Alaska, U.S.)

MAIN ARTICLE *volume 6 page 113, picture, volume 6 page 113*

IDL: *see in index* International Date Line

Ifalik (island in the Federated States of Micronesia)

islander using fishing nets *picture, volume 8 page 119*

Igbo (people)

Nigeria *volume 9 page 68*

igloo (dwelling)

Eskimo *volume 4 page 153*

Eskimo family *picture, volume 4 page 153*

igneous rock (geology)

rock *volume 11 page 75*

ignition point (physics)

combustion *volume 3 page 165*

fire *volume 5 page 25*

Iguaçu Falls (waterfall in Argentina and Brazil): *see in index* Iguazú Falls

iguana (lizard)

MAIN ARTICLE *volume 6 page 113, picture, volume 6 page 113*

MORE TO EXPLORE

lizard *volume 7 page 169*

Iguanodon (dinosaur)

MAIN ARTICLE *volume 6 page 114, picture, volume 6 page 114*

MORE TO EXPLORE

dinosaurs in scale *picture, volume 4 page 53*

Iguazú Falls (waterfall in Argentina and Brazil) *picture, volume 12 page 142*

Ihle, J. J. (German painter)

Bach portrait *picture, volume 2 page 4*

IJ (body of water in The Netherlands)

Amsterdam *volume 1 page 112*

“Ike” Eisenhower (president of the U.S.): *see in index* Eisenhower, Dwight D.

Ikhnaton (king of Egypt): *see in index* Akhenaton

Île de Gorée (island in Senegal): *see in index* Gorée Island

Îles Anglo-Normandes (islands in the English Channel): *see in index* Channel Islands

Îles du Vent (island group of the West Indies): *see in index* Windward Islands

Îles Marquises (islands in French Polynesia): *see in index* Marquesas Islands

Ilex (plant genus): *see in index* holly

“Iliad” (epic poem by Homer)
ancient Greece *volume 5 page 154*
Homer *volume 6 page 76*

illegal alien: *see in index* illegal immigration

illegal drug
drug *volume 4 page 79*

illegal immigration
Hispanic Americans *volume 6 page 63*

Illinois (Native American people)

MAIN ARTICLE *volume 6 page 115, picture, volume 6 page 115*

Illinois (state in the U.S.)

MAIN ARTICLE *volume 6 page 116, picture, volume 6 page 117, picture, volume 6 page 117, picture, volume 6 page 118*

MORE TO EXPLORE

geography

Chicago *picture, volume 3 page 93*

Picasso sculpture *picture, volume 10 page 79*

Mississippi and Ohio rivers *picture, volume 9 page 127*

Springfield

Lincoln statue and State Capitol
picture, volume 12 page 169

Joliet *volume 7 page 31*

illness: *see in index* disease

illuminated manuscript (art)

Medieval illustration *picture, volume 8 page 122*

painting *volume 10 page 8*

Persian manuscript *picture, volume 10 page 8*

illusionist: *see in index* magic

Illyrian (people)

Skopje *volume 12 page 102*

ILO (United Nations agency): *see in index* International Labour Organization

Imhotep (Egyptian architect, physician and statesman)

pyramid *volume 10 page 170*

immediate toxic response (medical disorder)

poison *volume 10 page 106*

immigration

Ellis Island *volume 4 page 127*

immigrants arrive at Ellis Island *picture, volume 4 page 128*

Immigration Act (U.S. legislation, 1924)

Asian Americans *volume 1 page 207*

Ellis Island *volume 4 page 127*

Immigration Act (U.S. legislation, 1965)

Asian Americans *volume 1 page 208*

Immigration and Nationality Act (U.S. legislation, 1952)

Asian Americans *volume 1 page 208*

immune system (anatomy and physiology)

MAIN ARTICLE *volume 6 page 119*

MORE TO EXPLORE

AIDS *volume 1 page 50*

allergy *volume 1 page 84*

lymphatic system *volume 7 page 189*

natural and acquired immunity *picture, volume 6 page 119*

transplant *volume 13 page 91*

virus *volume 14 page 98*

immunity (biological process)
immune system *volume 6 page 119*

immunological system (physiology): *see in index* immune system

Imouthes (Egyptian architect, physician and statesman): *see in index* Imhotep

impala (mammal) *picture, volume 7 page 59*
antelope *volume 1 page 138, picture, volume 1 page 139*

impeachment (law)
MAIN ARTICLE *volume 6 page 120, picture, volume 6 page 120*
MORE TO EXPLORE
United States government *volume 14 page 34*

imperator (title): *see in index* emperor

Imperial Diet (Japanese government): *see in index* Diet

imperialism (political entity): *see in index* empire

Imperial Palace (palace in Tokyo, Japan)
Tokyo *volume 13 page 76*

impressionism (art)
Monet *volume 8 page 160, picture, volume 8 page 160*
painting *volume 10 page 10*
Pissarro's "The Wheelbarrow" *picture, volume 10 page 10*

inboard motorboat (watercraft)
boat *volume 2 page 98*

Inca (Native American people)
MAIN ARTICLE *volume 6 page 121*
MORE TO EXPLORE
architecture and construction
Inca fortress near Cuzco *picture, volume 6 page 121*
Machu Picchu *volume 8 page 8, picture, volume 8 page 8*
history
Andes *volume 1 page 118*
conquistador *volume 3 page 186*
De Soto *volume 4 page 41*
Ecuador *volume 4 page 103*
Peru *volume 10 page 64, volume 10 page 65*
Pizarro *volume 10 page 90*
South America *volume 12 page 144*

incendiary bomb (military technology)
bomb *volume 2 page 104*

inch (unit of measurement)
measurement *volume 8 page 89*

incisor (tooth)
rodent *volume 11 page 80*
teeth *volume 13 page 30*

inclined plane
machine *volume 8 page 6, picture, volume 8 page 6*

income tax, personal (taxation)
tax *volume 13 page 21*

indentured servant
slavery *volume 12 page 105*

Independence (city in Missouri, U.S.)
Santa Fe Trail *volume 12 page 32*

independence (behavior)
adolescence *volume 1 page 31*

Independence Day (United States holiday)
MAIN ARTICLE *volume 6 page 122, picture, volume 6 page 122*

Independence Hall (building in Philadelphia, Pennsylvania, U.S.) *picture, volume 10 page 70*
Liberty Bell *volume 7 page 141*

Independence National Historical Park (park in Philadelphia, Pennsylvania, U.S.)
Independence Hall *picture, volume 10 page 70*

Independent (religious group): *see in index* Separatist

India (country in Asia)
MAIN ARTICLE *volume 6 page 123*
MORE TO EXPLORE
art and architecture
dance *volume 4 page 13*
Golden Temple *picture, volume 6 page 124*
Mughal tomb *picture, volume 1 page 170*
pottery *picture, volume 10 page 140*
sculpture *volume 12 page 56*
Taj Mahal *picture, volume 13 page 11*
economy
chicken house *picture, volume 10 page 140*
rice paddy *picture, volume 11 page 63*
geography
Asia *volume 1 page 200*
Ganges River *volume 5 page 86*

kingfisher in a national park *picture, volume 7 page 67*

history
Alexander the Great *volume 1 page 74*
Bangladesh *volume 2 page 22*
Gama *volume 5 page 83*
Indira Gandhi *volume 5 page 85*
Mahatma Gandhi *volume 5 page 85*
Mauryan Empire *volume 8 page 81, picture, volume 8 page 81*
Mughal Empire *volume 8 page 202*
Nehru *volume 9 page 30*
Pakistan *volume 10 page 13*
refugee *volume 11 page 41*
timeline *volume 6 page 123*

literature: *see in index* Indian literature

people and culture
alphabet *volume 1 page 89*
caste *volume 3 page 52*
cattle *volume 3 page 61*
Diwali *volume 4 page 58*
flag *volume 5 page 30*
International Human Rights Day *picture, volume 6 page 96*
mythology *volume 8 page 223*
national anthem *volume 9 page 13*
numbers and number systems *volume 9 page 107*
voters *picture, volume 14 page 105*
wedding custom *picture, volume 3 page 230*
religion
Hinduism *volume 6 page 55*
Pongal *picture, volume 6 page 125*
Jainism *picture, volume 7 page 9*
Muslims praying *picture, volume 6 page 164*
Sikhism *volume 12 page 87*

Indian, American (indigenous peoples):
see in index Native American

Indiana (state in the U.S.)
MAIN ARTICLE *volume 6 page 126, picture, volume 6 page 127*

Indiana Dunes (state park and national lakeshore in Indiana, U.S.)
Michigan *volume 8 page 118*

Indianapolis (state capital of Indiana, U.S.)
MAIN ARTICLE *volume 6 page 128*
MORE TO EXPLORE
Indiana *volume 6 page 126*

Indianapolis 500 (automobile race)
Indianapolis *volume 6 page 128*

Indianapolis Clowns (U.S. baseball team)

Aaron *volume 1 page 6*

Indianapolis Motor Speedway (race-track in Indianapolis, Indiana, U.S.)
Indianapolis *volume 6 page 128*

Indian art: *see in index* Native American arts

Indian Bridge (town in Barbados): *see in index* Bridgetown

Indian literature: *see in index* Veda

Indian mustard (plant and condiment):
see in index brown mustard

Indian National Congress (political party in India)
India *volume 6 page 124*
Indira Gandhi *volume 5 page 85*
Nehru *volume 9 page 30*

Indian Ocean

MAIN ARTICLE *volume 6 page 128*

MORE TO EXPLORE

Indonesia *picture, volume 6 page 129*
ocean *volume 9 page 117*
Seychelles *picture, volume 12 page 74*
tsunami *volume 13 page 104*

Indian peacock (bird): *see in index* blue peacock

Indian reservation

Native Americans *volume 9 page 20*

Indians (U.S. baseball team): *see in index* Cleveland Indians

Indian Territory (historical territory in the U.S.)
Oklahoma *volume 9 page 130*
relocated Native Americans
Chickasaw *volume 3 page 94*
Choctaw *volume 3 page 110*
Comanche *volume 3 page 164*
Creek *volume 3 page 213*
Delaware *volume 4 page 29*

Indian water buffalo (mammal): *see in index* water buffalo

individual sports

sports *volume 12 page 167*

Indochina War (Franco-Vietnamese history 1946-54): *see in index* French Indochina War

Indonesia (island country in Southeast Asia)

MAIN ARTICLE *volume 6 page 130*

MORE TO EXPLORE

geography
Asia *volume 1 page 200*
Indian Ocean *picture, volume 6 page 129*
island *volume 6 page 167*
volcano *volume 14 page 102, picture, volume 14 page 99*
history
East Timor *volume 4 page 96*
Dili *volume 4 page 49*
Madagascar *volume 8 page 10*
images
green tree python *picture, volume 10 page 172*
Indonesian Girl Scouts *picture, volume 12 page 54*
jackfruit *picture, volume 6 page 131*

indri (primate)

lemur *volume 7 page 128*
primate *picture, volume 10 page 149*

indulgence (Roman Catholicism)

Luther *volume 7 page 186*

Indus civilization (southern Asia, 2500-1700 BC): *see in index* Indus Valley civilization

Indus River (river in Asia)

MAIN ARTICLE *volume 6 page 132, picture, volume 6 page 132*

MORE TO EXPLORE

India *volume 6 page 123*

industrial accident (safety): *see in index* accident

industrial ceramics: *see in index* ceramics

industrial glass: *see in index* glass

Industrial Organizations, Congress of (labor organization): *see in index* Congress of Industrial Organizations

Industrial Revolution

MAIN ARTICLE *volume 6 page 132*

MORE TO EXPLORE

social and political issues
city *volume 3 page 125*
Europe *volume 4 page 164*
labor *volume 7 page 96*
Massachusetts *volume 8 page 73*
socialism *volume 12 page 119*

trade *volume 13 page 89*

war *volume 15 page 10*

technology and invention *volume 13 page 26*
agriculture *volume 1 page 49*
manufacturing *volume 8 page 46*
textile *volume 13 page 53*
power looms *picture, volume 6 page 134*
spinning cloth *picture, volume 6 page 133*

industrial robot

robot *volume 11 page 74*

industrial ship

ship *volume 12 page 82*

industry

MAIN ARTICLE *volume 6 page 134*

MORE TO EXPLORE

conservation *volume 3 page 187*

Indus Valley civilization (southern Asia, 2500-1700 BC)

MAIN ARTICLE *volume 6 page 135, picture, volume 6 page 136*

MORE TO EXPLORE

Asia *volume 1 page 204*
civilization *volume 3 page 127*
India *volume 6 page 124*
Indus River *volume 6 page 132*
maze and dice carvings *picture, volume 6 page 135*
Pakistan *volume 10 page 14*
Harappa *picture, volume 3 page 125*

infancy (growth stage)

child development *volume 3 page 96*
human infants *picture, volume 3 page 96, picture, volume 8 page 37*
reproductive system *volume 11 page 49*
sleep *volume 12 page 108*

infant (growth stage): *see in index* infancy

infection (illness)

bacteria *volume 2 page 5*
penicillin *volume 10 page 53*
pneumonia *volume 10 page 103*
surgery *volume 12 page 207*
tonsillitis *picture, volume 13 page 81*

infectious disease

animal disease *volume 4 page 55*
human disease *volume 4 page 56*

infield (athletics)

track and field *volume 13 page 84*

infield (part of baseball field)
baseball *volume 2 page 30*
softball *volume 12 page 122*

influenza (viral infection)
MAIN ARTICLE *volume 6 page 136*

MORE TO EXPLORE

AIDS *volume 1 page 50*
cough *volume 3 page 207*
epidemic *volume 4 page 146*
flu shot *picture, volume 10 page 164*
temporary hospital, 1918-19 flu epidemic *picture, volume 6 page 136*

influenza epidemic of 1918-19 (pandemic)
temporary hospital *picture, volume 6 page 136*

information: *see in index* data; library; statistics

infrared radiation (physics)
greenhouse effect *picture, volume 5 page 157*
radiation *volume 11 page 17*
types of electromagnetic radiation *picture, volume 11 page 18*

Ingalls, Laura Elizabeth (United States author): *see in index* Wilder, Laura Ingalls

inhaler (medical device) *picture, volume 1 page 213*

ink painting (art)
painting *volume 10 page 9*

inland sea (physical feature): *see in index* lake

in-line skating (recreation) *picture, volume 11 page 81*
roller skating *volume 11 page 81*
skating *volume 12 page 95*

inner ear (anatomy)
ear *volume 4 page 87, picture, volume 4 page 87*

Inner Light (religious concept)
Quakers *volume 11 page 5*

Inner Mongolia (autonomous region of China)
Mongolia *volume 8 page 164*

inner planet (astronomy): *see in index* terrestrial planet

inning (baseball)
baseball *volume 2 page 32*

innings (cricket)
cricket *volume 3 page 215*

Innu (Native American people)
Newfoundland and Labrador *volume 9 page 46*

Inuit (people): *see in index* Eskimo

input/output device (computer technology)
computer *volume 3 page 173*

Inquisition (Roman Catholicism)
MAIN ARTICLE *volume 6 page 137, picture, volume 6 page 137*

MORE TO EXPLORE

Ferdinand and Isabella *volume 5 page 10*
Galileo *volume 5 page 82*
Reformation *volume 11 page 39*
Spain *volume 12 page 155*

inquisitor (Roman Catholicism)
Inquisition *volume 6 page 137*

insanity: *see in index* mental illness

insect (animal class)
MAIN ARTICLE *volume 6 page 138*

MORE TO EXPLORE

brain *volume 2 page 122*
cave *volume 3 page 64*
exoskeleton *volume 4 page 172, picture, volume 6 page 139*
hormone *volume 6 page 84*
images
animal species *picture, volume 7 page 167*
body structure *picture, volume 6 page 138*
honeybees *picture, volume 6 page 138*
ladybug and eggs *picture, volume 4 page 108*
muscle attachment *picture, volume 8 page 207*
respiratory system *picture, volume 11 page 54*

insecticide (chemical compound)
mosquito *volume 8 page 189*

Institutional Revolutionary Party (political party in Mexico)
Mexico *volume 8 page 112*

insulin (hormone)
diabetes *volume 4 page 43*
endocrine system *volume 4 page 136*
pancreas *volume 10 page 24*

Insurance City (city in Connecticut, U.S.): *see in index* Hartford

insurrection (politics): *see in index* rebellion

intake stroke (internal combustion)
internal-combustion engine *volume 6 page 141, picture, volume 6 page 140*

integer (mathematics)
numbers and number systems *volume 9 page 106*

integrated circuit (electronics) *picture, volume 3 page 174*
computer *volume 3 page 174*
electronics *volume 4 page 123*
worker assembling microchip *picture, volume 4 page 123*

integration (racial): *see in index* racial integration

intelligence (psychology)
artificial intelligence *volume 1 page 195*

intelligence, artificial: *see in index* artificial intelligence

intelligence agent (intelligence): *see in index* spy

intelligent design: *see in index* creationism

intensity (sound)
sound *volume 12 page 135, picture, volume 12 page 135*

intensive care unit (hospital area)
hospital *volume 6 page 88*

interception (sports)
football *volume 5 page 49*

interest (finance)
banking *volume 2 page 24*

Interior, Department of the (U.S. government agency)
United States government executive departments *table, volume 14 page 35*

Interior Salish (Native American people): *see in index* Salish

internal-combustion engine
MAIN ARTICLE *volume 6 page 140, picture, volume 6 page 140*
MORE TO EXPLORE
automobile *volume 1 page 235, picture, volume 1 page 235*

internal materials salvage (waste management): *see in index* internal recycling

internal migration

human migration *volume 8 page 126*

internal recycling

(waste management)
recycling *volume 11 page 35*

international aid: *see in index* foreign aid

International Association of Athletics Federations

(international sports organization)

track and field *volume 13 page 87*

International Brigades

(military force)

Spanish Civil War *volume 12*

page 159

International Committee of the Red Cross

(Swiss aid organization)

Red Cross and Red Crescent *volume 11*

page 36

International Court of Justice

(United Nations)

Hague, The *volume 6 page 5*

Peace Palace *picture, volume 6 page 6*

United Nations *volume 14 page 22*

International Date Line

time *volume 13 page 67*

International Ice Hockey Federation

(sports organization)

ice hockey *volume 6 page 69*

International Labour Organization

(United Nations agency)

labor *volume 7 page 98*

International Military Tribunal

(court)

Nuremberg Trials *volume 9 page 110*

International Morse Code

(communication) *picture, volume 8 page 186*

Morse Code *volume 8 page 185*

International Movement of the Red Cross and Red Crescent

(charitable organization): *see in index* Red Cross

and Red Crescent

International Olympic Committee

Olympic Games *volume 9 page 133*

International Spy Museum

(museum in Washington, D.C., U.S.)

hidden microphones *picture, volume 12*
page 169

international trade

Indian Ocean *volume 6 page 129*

North Sea *volume 9 page 92*

trade *volume 13 page 88*

International Union for Conservation of Nature and Natural Resources

endangered species *volume 4 page 134*

international war

war *volume 15 page 8*

International Working Men's Association

(labor organization)

membership card *picture, volume 12*

page 120

Internet

(international computer network)

MAIN ARTICLE *volume 6 page 141*

MORE TO EXPLORE

book and bookmaking *volume 2*

page 110

computer *volume 3 page 172*

newspaper *volume 9 page 55*

telecommunication *volume 13 page 34*

internment camp

Asian Americans *volume 1 page 208,*

picture, volume 1 page 207

Interstate Commerce Act

(U.S. legislation, 1887)

Cleveland *volume 3 page 136*

intestines

(anatomy)

MAIN ARTICLE *volume 6 page 142*

MORE TO EXPLORE

grasshopper *picture, volume 4 page 48*

human *picture, volume 4 page 47, picture,*

volume 6 page 143

intifada

(Israeli-Palestinian history)

Arab-Israeli Wars *volume 1 page 159*

Israel *volume 6 page 170*

Intolerable Acts

(British laws, 1774)

American Revolution *volume 1 page 99*

intranational war

war *volume 15 page 8*

Inuit

(people): *see in index* Eskimo

invention

(technology)

MAIN ARTICLE *volume 13 page 25*

MORE TO EXPLORE

dialysis machine *picture, volume 13*

page 29

Edison with lightbulb *picture, volume 13*

page 27

windmill and waterwheel *picture, volume 13*

page 26

For more about invention, look for articles on these inventors:

Banneker,
Benjamin
Bell, Alexander
Graham
Deere, John
Edison, Thomas
Alva
Franklin,
Benjamin

Gutenberg,
Johannes
Marconi,
Guglielmo
Whitney, Eli
Wright, Orville
and Wilbur

invertebrate

(animal without a backbone)

MAIN ARTICLE *volume 6 page 143*

MORE TO EXPLORE

animal *volume 1 page 124*

brain *volume 2 page 122*

eye *volume 4 page 176*

mollusk *volume 8 page 157*

Inward Light

(religious concept): *see in index* Inner Light

Io

(moon of Jupiter)

Jupiter *volume 7 page 41*

IOC

(international sports organization):

see in index International Olympic Committee

ion

(physics)

atom *volume 1 page 225*

Ionian

(people)

ancient Greece *volume 5 page 154*

IOU

(abbreviation)

common abbreviations *table, volume 1*

page 8

Iowa

(Native American people)

MAIN ARTICLE *volume 6 page 144*

MORE TO EXPLORE

Missouri tribe *volume 8 page 145*

Oto *volume 9 page 155*

Shauhaunapotinia *picture, volume 6*

page 144

Iowa

(state in the U.S.)

MAIN ARTICLE *volume 6 page 145*

MORE TO EXPLORE

Des Moines *picture, volume 6 page 145*

young corn plants *picture, volume 6*

page 146

Ioway

(Native American people): *see in index* Iowa

Ipet resyt (ancient temple in Luxor, Egypt): *see in index* Luxor, Temple of

Iqaluit (capital city of Nunavut, Canada) Nunavut *volume 9 page 108*

IRA (Irish military organization): *see in index* Irish Republican Army

Iran (country in the Middle East)

MAIN ARTICLE *volume 6 page 147*

MORE TO EXPLORE

geography

Asia *volume 1 page 200*

Middle East *volume 8 page 124*

history

Iran-Iraq War *volume 6 page 150*

Reagan *volume 11 page 33*

timeline *volume 6 page 147*

people and culture

bazaar *picture, volume 13 page 33*

carpet weaving *picture, volume 6 page 149*

Kurds *volume 7 page 90*

mosque courtyard *picture, volume 6 page 148*

New Year's Day *volume 9 page 56*

Iran-Contra Affair (U.S. history)

Reagan *volume 11 page 33*

Iran hostage crisis (U.S. history)

Carter *volume 3 page 47*

Iran-Iraq War (Middle Eastern history, 1980-88)

MAIN ARTICLE *volume 6 page 150*

MORE TO EXPLORE

Iran *volume 6 page 149*

Iraq *volume 6 page 153*

Iraqi soldier, Iran-Iraq War *picture, volume 6 page 150*

Saddam Hussein *volume 12 page 7*

Iraq (country in the Middle East)

MAIN ARTICLE *volume 6 page 151, picture, volume 6 page 151, picture, volume 6 page 153*

MORE TO EXPLORE

architecture *volume 1 page 169*

geography

Asia *volume 1 page 200*

Euphrates River *volume 4*

page 159, picture, volume 4 page 159

Middle East *volume 8 page 124*

Tigris River *volume 13 page 66*

history

Bush, George *volume 2 page 155*

Bush, George W. *volume 2 page 157*

Iran-Iraq War *volume 6 page 150*

Kurds *volume 7 page 90*

Kuwait *volume 7 page 92*

Persian Gulf War *volume 10 page 62*

Saudi Arabia *volume 12 page 45*

timeline *volume 6 page 151*

Iraqi Freedom, Operation (U.S. military operation): *see in index* Iraq War

Iraq-Iran War (Middle Eastern history, 1980-88): *see in index* Iran-Iraq War

Iraq War (2003)

Bush *volume 2 page 157*

Iraq *volume 6 page 153*

Powell *volume 10 page 141*

Saddam Hussein *volume 12 page 7*

Ireland (country in Europe)

MAIN ARTICLE *volume 6 page 154*

MORE TO EXPLORE

geography

Cobh *picture, volume 3 page 61*

Cork Hill with Dublin Castle *picture, volume 4 page 80*

Eyeries village *picture, volume 6 page 155*

peat bog *picture, volume 2 page 99*

history

Newgrange tomb *picture, volume 6 page 155*

Northern Ireland *volume 9 page 89*

potato famine *volume 5 page 7, volume 10 page 137*

timeline *volume 6 page 154*

Ulster *volume 14 page 9*

United Kingdom *volume 14 page 16*

Vikings *volume 14 page 89*

Saint Patrick's Day *volume 12 page 15*

Ireland, Northern (part of the United Kingdom): *see in index* Northern Ireland

Iririki (island of Vanuatu)

Vila's harbor *picture, volume 14 page 90*

iris (part of eye)

eye *volume 4 page 175, picture, volume 4 page 175*

iris (plant and flower)

MAIN ARTICLE *volume 6 page 157, picture, volume 6 page 157*

Irish (people)

Northern Ireland *volume 9 page 89*

Irish Free State (country in Europe): *see in index* Ireland

Irish Republican Army (Irish military organization)

Northern Ireland *volume 9 page 90*

Irish setter (breed of dog)

sporting dogs *table, volume 4 page 62*

iron (chemical element)

MAIN ARTICLE *volume 6 page 157*

MORE TO EXPLORE

food and nutrition *volume 5 page 44*

date *volume 4 page 18*

Iron Age *volume 6 page 158*

metal *volume 8 page 106*

skyscraper *volume 12 page 104*

steel *volume 12 page 184*

technology and invention *volume 13 page 25*

Iron Age (prehistoric period)

MAIN ARTICLE *volume 6 page 158, picture, volume 6 page 158, picture, volume 6 page 159*

MORE TO EXPLORE

iron *volume 6 page 158*

technology and invention *volume 13 page 25*

Ironwood (city in Michigan, U.S.)

Hiawatha statue *picture, volume 6 page 49*

Iroquois (Native American people)

MAIN ARTICLE *volume 6 page 160*

MORE TO EXPLORE

house and canoe *picture, volume 6 page 160*

lacrosse *volume 7 page 101*

peoples

Native Americans *volume 9 page 16*

Oneida *volume 9 page 137*

Shawnee *volume 12 page 78*

Wyandot *volume 15 page 78*

places

Ontario *volume 9 page 140*

Quebec *volume 11 page 9*

Iroquois Confederacy (U.S. Indian confederation)

Albany Congress *volume 1 page 67*

tribes and people

Cayuga *volume 3 page 64*

Hiawatha *volume 6 page 49*

Iroquois *volume 6 page 160*

Mohawk *volume 8 page 151*

Oneida *volume 9 page 137*

Onondaga *volume 9 page 138*

Seneca *volume 12 page 65*

Tuscarora *volume 13 page 117*

irregular galaxy (astronomy)
galaxy *volume 5 page 82*

irrigation (agriculture)
MAIN ARTICLE *volume 6 page 160*

MORE TO EXPLORE

agriculture *volume 1 page 48*

dam *volume 4 page 9*

river *volume 11 page 68*

usage

desert in Saudi Arabia *picture, volume 6 page 161*

Euphrates *volume 4 page 159*

France *picture, volume 6 page 162*

Ganges River *volume 5 page 87*

Hohokam culture *volume 6 page 70*

Idaho *picture, volume 6 page 161*

Nile River *volume 9 page 73*

Tigris River *volume 13 page 66*

Isaac (Hebrew patriarch)

Abraham *volume 1 page 14*

Isabela Island (island of Ecuador) *picture, volume 5 page 81*

Isabella I (queen of Spain)

MAIN ARTICLE *volume 5 page 10, picture, volume 5 page 10*

MORE TO EXPLORE

Columbus *volume 3 page 163*

Inquisition *volume 6 page 137*

Spain *volume 12 page 155*

Iscaiot, Judas (Apostle): *see in index*
Judas Iscaiot

Ischia, Antonio Canova, marchese d'
(Italian sculptor): *see in index* Canova,
Antonio

Ishmael (son of Abraham)

Abraham *volume 1 page 14*

Isis (Egyptian goddess)

MAIN ARTICLE *volume 6 page 162, picture, volume 6 page 163*

Islam (religion)

MAIN ARTICLE *volume 6 page 163*

MORE TO EXPLORE

architecture *volume 1 page 170*

Haram Mosque, al- *picture, volume 8 page 91*

mosque *volume 8 page 188*

ribat *picture, volume 13 page 110*

beliefs and practices

head scarves *picture, volume 6 page 165*

Koran *volume 7 page 77, picture, volume 9 page 68*

pilgrimage *volume 10 page 85*

prayer *picture, volume 6 page 164, picture, volume 8 page 31*

saint *volume 12 page 9*

history

Abraham *volume 1 page 13*

Arabs *volume 1 page 159*

India *volume 6 page 124*

Kurds *volume 7 page 89*

Malcolm X *volume 8 page 29*

Manila *volume 8 page 43*

martyr *volume 8 page 67*

Moor *volume 8 page 180*

Muhammad *volume 8 page 202*

Ottoman Empire *volume 9 page 156*

Portugal *volume 10 page 134*

for further history: *see in index* Islamic
world

major world religions *table, volume 11 page 43*

regions

Europe *volume 4 page 163*

Balkan Peninsula *volume 2 page 12*

Middle East *volume 8 page 124*

Arabian Peninsula *volume 1 page 157*

Egypt *picture, volume 4 page 110*

Iran *volume 6 page 149*

Lebanon *volume 7 page 121*

Mecca *volume 8 page 90*

Oman *volume 9 page 136*

Palestine *volume 10 page 17*

Saudi Arabia *volume 12 page 44*

Pakistan *volume 10 page 13*
preparing meals during Ramadan
picture, volume 11 page 26

Islam, five pillars of (religion)

Islam *volume 6 page 164*

Islam, Nation of (U.S. religious organization)

Malcolm X *volume 8 page 29*

Islam, pillars of (religion): *see in index*

Islam, five pillars of

Islamabad (capital city of Pakistan)

MAIN ARTICLE *volume 6 page 166, picture, volume 6 page 166*

MORE TO EXPLORE

Pakistan *volume 10 page 13*

Islamic calendar: *see in index* Muslim
calendar

Islamic Republic of Iran (country in the Middle East): *see in index* Iran

Islamic Salvation Front (political party in Algeria)
Algeria *volume 1 page 79*

Islamic sundial (timekeeping device): *see in index* sundial

Islamic world (religious and cultural group of peoples)

ancient Egypt *volume 4 page 115*

Arabian Peninsula *volume 1 page 157*

Arab-Israeli wars *volume 1 page 158*

Byzantine Empire *volume 2 page 159*

Caliphate *volume 3 page 14*

Abu Bakr *volume 1 page 14*

Crusades *volume 3 page 223*

fortress *picture, volume 12 page 224*

Damascus *volume 4 page 10*

human migration *volume 8 page 127*

Iraq *volume 6 page 152*

Jerusalem *volume 7 page 21*

Mughal Empire *volume 8 page 202*

Persia *volume 10 page 62*

Spain *volume 12 page 154*

Ferdinand and Isabella *volume 5 page 10*

sundial *volume 12 page 204*

Yemen *volume 15 page 91*

island (landform)

MAIN ARTICLE *volume 6 page 166, picture, volume 6 page 166, picture, volume 6 page 167, picture, volume 6 page 167*

MORE TO EXPLORE

Fiji archipelago *picture, volume 5 page 19*

Nauru *picture, volume 9 page 22*

Tarawa Atoll *picture, volume 2 page 10*

island gray fox (mammal) *picture, volume 2 page 73*

Islas de Barlovento (island group of the West Indies): *see in index* Windward Islands

Isma'il (son of Abraham): *see in index*
Ishmael

Israel (country in the Middle East)

MAIN ARTICLE *volume 6 page 168*

MORE TO EXPLORE

cooperative farming *picture, volume 6 page 169*

geography

Asia *volume 1 page 200*

Haifa *picture, volume 6 page 170*

Jerusalem

Western Wall and the Dome of the

Rock *picture, volume 7 page 21*

Middle East *volume 8 page 124*

Negev *picture, volume 6 page 168*

Tel Aviv-Yafo *picture, volume 13 page 33*

history

Arab-Israeli Wars *volume 1 page 157*

Egypt *volume 4 page 111*

Sadat *volume 12 page 5*

Jerusalem *volume 7 page 21*

Jordan *volume 7 page 34*

Lebanon *volume 7 page 121*

Palestine *volume 10 page 17*

Palestine Liberation Organization
volume 10 page 19

refugee *volume 11 page 41*

Syria *volume 12 page 224*

timeline *volume 6 page 168*

Judaism *volume 7 page 39*

Purim celebration *picture, volume 10 page 168*

legislature *volume 7 page 124, picture, volume 7 page 124*

Israel (ancient people and kingdom)

Abraham *volume 1 page 13*

Bible *volume 2 page 67*

Israel “modern nation” *volume 6 page 169*

Judaism *volume 7 page 38*

Palestine *volume 10 page 18*

Issa (people)

Djibouti *volume 4 page 59*

Istanbul (city in Turkey)

MAIN ARTICLE *volume 6 page 171*

MORE TO EXPLORE

ancient Rome *volume 11 page 91*

Blue Mosque *picture, volume 6 page 171, picture, volume 8 page 188*

Byzantine Empire *volume 2 page 159*

Crusades *volume 3 page 224*

Eastern Orthodox Churches *volume 4 page 94*

Hagia Sophia *picture, volume 13 page 112*

Ottoman Empire *volume 9 page 156*

Isurus (fish): *see in index* mako shark**Itaipú Dam** (dam in Brazil and Paraguay)

picture, volume 10 page 31

Italian cypress (tree)

conifers *picture, volume 3 page 183*

Italian Somaliland (historical colony in Africa)

Somalia *volume 12 page 131*

Italic peoples: *see in index* Etruscans**Italy** (country in Europe)

MAIN ARTICLE *volume 6 page 172*

MORE TO EXPLORE**geography**

Adriatic Sea *volume 1 page 31*

Amalfi coast *picture, volume 8 page 94*

Florence *picture, volume 6 page 173*

Grand Canal in Venice *picture, volume 14 page 65*

Mount Etna *volume 4 page 157*

grape harvest *picture, volume 6 page 172*

history

ancient: *see in index* Rome, ancient

city-state *volume 3 page 126*

colonialism

Addis Ababa *volume 1 page 29*

Asmara *volume 1 page 209*

Ethiopia *volume 4 page 156*

Libya *volume 7 page 145*

Somalia *volume 12 page 131*

San Marino *volume 12 page 29*

timeline *volume 6 page 172*

World War I *volume 15 page 61*

World War II *volume 15 page 65*

Trevi Fountain *picture, volume 11 page 87*

IUCN: *see in index* International Union for Conservation of Nature and Natural Resources**Ivan III** (Russian prince)

Russia *volume 11 page 106*

tsar *volume 13 page 103*

Ivan IV (tsar of Russia)

MAIN ARTICLE *volume 6 page 175, picture, volume 13 page 103*

MORE TO EXPLORE

Russia *volume 11 page 106*

tsar *volume 13 page 103*

Ivan the Great (Russian prince): *see in index* Ivan III**Ivan the Terrible** (tsar of Russia): *see in index* Ivan IV**ivory** (substance obtained from the tusks or teeth of animals)

elephant *volume 4 page 125*

Ivory Coast (country in Africa): *see in index* Côte d'Ivoire**ivy** (plant)

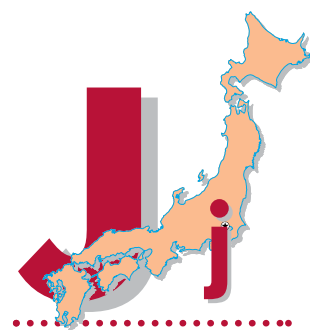
MAIN ARTICLE *volume 6 page 175, picture, volume 6 page 175*

Iwo Jima, Battle of (Japanese-U.S. history)

World War II *volume 15 page 70*

Iztaccíhuatl (volcanic mountain, Mexico)

picture, volume 9 page 82

**jacaranda** (tree genus)

Pretoria *volume 10 page 147*

jackal (mammal)

MAIN ARTICLE *volume 7 page 4, picture, volume 7 page 4*

jackfruit

Sumatra *picture, volume 6 page 131*

jack-o'-lantern (decoration)

pumpkin *volume 10 page 168*

jackrabbit (mammal) *picture, volume 11 page 13***Jackson** (state capital of Mississippi, U.S.)

MAIN ARTICLE *volume 7 page 4*

MORE TO EXPLORE

Mississippi *volume 8 page 141*

State Capitol *picture, volume 7 page 5*

Jackson, Andrew (president of the U.S.)

MAIN ARTICLE *volume 7 page 5, picture, volume 7 page 5*

MORE TO EXPLORE

timeline *volume 7 page 5*

Trail of Tears *volume 13 page 90*

Van Buren *volume 14 page 54*

War of 1812 *volume 15 page 13*

Jackson, Jesse (U.S. minister and activist)

MAIN ARTICLE *volume 7 page 7, picture, volume 7 page 7*

Jackson, Mahalia (U.S. singer)

gospel music *volume 5 page 130*

Jackson, Thomas Jonathan (Confederate general)
American Civil War *picture*, *volume 1*
page 97

Jacobins (French political history)
French Revolution *volume 5* *page 70*

jade (gemstone)
jewelry and gems *volume 7* *page 24*

Jaffa (ancient city in the Middle East)
Tel Aviv-Yafo *volume 13* *page 33*

Jagger, Mick (British singer) *picture*, *volume 11* *page 78*

Jagiellon dynasty (European history)
Poland *volume 10* *page 108*

jaguar (cat)
MAIN ARTICLE *volume 7* *page 8*, *picture*,
volume 7 *page 8*

Jainism (religion)
MAIN ARTICLE *volume 7* *page 8*, *picture*,
volume 7 *page 9*
MORE TO EXPLORE
Gandhi *volume 5* *page 86*
monk *volume 8* *page 166*

Jakarta (capital city of Indonesia)
MAIN ARTICLE *volume 7* *page 9*
MORE TO EXPLORE
Indonesia *volume 6* *page 130*

jakfruit: *see in index* jackfruit

Jalta (resort city in the Ukraine): *see in index* Yalta

Jamaica (island country in the West Indies)
MAIN ARTICLE *volume 7* *page 10*, *picture*,
volume 7 *page 10*
MORE TO EXPLORE
Devon House in Kingston *picture*, *volume 7* *page 68*

jamboree (scouting)
scouting *volume 12* *page 54*

James Abram Garfield (president of the U.S.): *see in index* Garfield, James A.

Jamestown (English colony in North America)
MAIN ARTICLE *volume 7* *page 11*, *picture*,
volume 7 *page 11*
MORE TO EXPLORE
United States *volume 14* *page 28*
Virginia *volume 14* *page 95*

James V (king of Scotland)
Mary, Queen of Scots *volume 8* *page 67*

jami' (place of worship): *see in index* mosque

"Jana-gana-mana" (work by Tagore and national anthem of India)
national anthem *volume 9* *page 13*

Jane Seymour (queen of England)
Henry VIII *volume 6* *page 39*

Japan (island country in Asia)
MAIN ARTICLE *volume 7* *page 12*

MORE TO EXPLORE
art and architecture
Bunraku puppet theater *picture*, *volume 13* *page 59*
calligraphy *picture*, *volume 3* *page 15*
dance *volume 4* *page 13*
drama *volume 4* *page 73*
Kabuki *picture*, *volume 7* *page 13*
Meiji Shrine *picture*, *volume 8* *page 95*
pagoda *picture*, *volume 7* *page 12*
theater *volume 13* *page 58*

geography
Asia *volume 1* *page 200*
earthquake damage *picture*, *volume 4*
page 92
Mount Fuji *picture*, *volume 5* *page 74*
Tokyo *picture*, *volume 3* *page 124*
Shibuya *picture*, *volume 13* *page 76*

history
empire *volume 4* *page 132*
Fillmore *volume 5* *page 21*
Indonesia *volume 6* *page 131*
Mao *volume 8* *page 48*
Nauru *volume 9* *page 22*
North Korea *volume 7* *page 81*
South Korea *volume 7* *page 84*
Taiwan *volume 13* *page 9*
timeline *volume 7* *page 12*
World War II *volume 15* *page 65*
weapon *volume 15* *page 26*

macaque monkeys *picture*, *volume 9*
page 14

people and culture
city street *picture*, *volume 7* *page 15*
festival in Kanazawa *picture*, *volume 7*
page 15
ginkgo *volume 5* *page 115*
sumo *picture*, *volume 15* *page 73*
swimming *volume 12* *page 217*
soy sauce factory *picture*, *volume 5*
page 11

Japanese (people)
Japan *volume 7* *page 13*

Japanese American (people)
Asian Americans *volume 1* *page 207*
internment camp *picture*, *volume 1*
page 207

Japanese chestnut (tree)
chestnut *volume 3* *page 89*

Japanese language
alphabet *volume 1* *page 88*

Japanese monarch birch (tree)
birch *volume 2* *page 75*

Japanese snowball (shrub)
viburnum *volume 14* *page 76*

Japanese yew (botany)
branch with seeds *picture*, *volume 15*
page 93

jaundice (medical disorder)
hepatitis *volume 6* *page 42*
liver *volume 7* *page 167*

Javanese (people)
Suriname *volume 12* *page 208*

Javanese peacock (bird): *see in index* green peacock

javelin throw (athletics)
track and field *volume 13* *page 86*, *picture*,
volume 13 *page 85*

Jay, John (U.S. statesman and chief justice)
Federalist papers *volume 5* *page 9*

jazz (music)
MAIN ARTICLE *volume 7* *page 16*, *picture*,
volume 7 *page 16*
MORE TO EXPLORE
Armstrong *volume 1* *page 188*

"Jazz Singer, The" (film by Crosland)
movie *volume 8* *page 199*

Jeanneret, Charles-Édouard (Swiss architect): *see in index* Corbusier, Le

Jefferson, Thomas (president of the U.S.)
MAIN ARTICLE *volume 7* *page 17*, *picture*,
volume 7 *page 17*
MORE TO EXPLORE
Adams *volume 1* *page 23*
Declaration of Independence *volume 4*
page 24
George III *volume 5* *page 100*

Hamilton *volume 6 page 11*
 Lewis and Clark Expedition *volume 7 page 137*
 Louisiana Purchase *volume 7 page 182*
 Madison *volume 8 page 12*
 Monroe *volume 8 page 171*
 timeline *volume 7 page 17*
 United States *volume 14 page 29*

Jefferson City (state capital of Missouri, U.S.)

MAIN ARTICLE *volume 7 page 19*

MORE TO EXPLORE

governor's mansion *picture, volume 7 page 19*
 Missouri *volume 8 page 146*

jihad (Islam): *see in index* jihad

jellyfish (marine animal)

MAIN ARTICLE *volume 7 page 19, picture, volume 7 page 20*

Jemison, Mae (U.S. doctor and astronaut)

MAIN ARTICLE *volume 7 page 20, picture, volume 7 page 20*

Jenner, Edward (English doctor)

smallpox *volume 12 page 111*
 vaccine *volume 14 page 49*

Jenney, William Le Baron (U.S. engineer and architect)

architecture *volume 1 page 171*

“Jennifer, Hecate, Macbeth, William McKinley, and Me, Elizabeth” (book by Konigsburg)

Konigsburg *volume 7 page 76*

Jerusalem (capital city of Israel)

MAIN ARTICLE *volume 7 page 21*

MORE TO EXPLORE

Arab-Israeli Wars *volume 1 page 158*
 Crusades *volume 3 page 223*
 Israel *volume 6 page 168*
 pilgrimage *volume 10 page 84*
 Purim celebration *picture, volume 10 page 168*
 Western Wall and the Dome of the Rock *picture, volume 7 page 21*

Jerusalem, Temple of (Judaism)

Judaism *volume 7 page 38*

Jesuit (religious order)

Reformation *volume 11 page 39*

Jesus Christ

MAIN ARTICLE *volume 7 page 22, picture, volume 7 page 22*

MORE TO EXPLORE

ancient Rome *volume 11 page 90*
 Bethlehem *volume 2 page 64*
 Christianity *volume 3 page 112*
 Christmas *volume 3 page 114*
 Easter *volume 4 page 93*
 Roman Catholicism *volume 11 page 82*

Jesus Christ of Latter-day Saints, Church of (religion): *see in index* Mormons

Jesus Christ of Latter Day Saints, Reorganized Church of (U.S. church): *see in index* Christ, Community of

Jesus of Nazareth: *see in index* Jesus Christ

jet (gemstone)

jewelry and gems *volume 7 page 24*

jet engine (motor)

airplane *volume 1 page 56*
 transportation *volume 13 page 93*

jet propulsion

rocket *volume 11 page 77*

Jew (people): *see in index* Jewish people

jewel anemone (marine animal) *picture, volume 12 page 57*

jewelry

MAIN ARTICLE *volume 7 page 23*

MORE TO EXPLORE

amber *volume 1 page 92*
 Mississippian culture gorget *picture, volume 8 page 143*
 necklace *picture, volume 7 page 23*
 Queen Victoria's crown *picture, volume 7 page 24*

Jewish Bible: *see in index* Hebrew Bible

Jewish calendar (religion)

calendar *volume 3 page 10*

Jewish people

Europe *volume 4 page 163*
 Ferdinand and Isabella *volume 5 page 10*
 Vilnius *volume 14 page 91*
 Holocaust *volume 6 page 71*
 Frank *volume 5 page 61*
 Hitler *volume 6 page 64*
 Jewish identification badges *picture, volume 6 page 71*
 Nazi Party *volume 9 page 26*
 Poland *volume 10 page 109*
 Warsaw *volume 15 page 14*

Judaism *volume 7 page 36*

Ku Klux Klan *volume 7 page 89*

Palestine *volume 10 page 17*

Bethlehem *volume 2 page 64*

Tel Aviv-Yafo *volume 13 page 34*

Jewish religious year (religion): *see in index* Jewish calendar

jihad (Islam)

Islam *volume 6 page 165*

Jina (Jainism): *see in index* Tirthankara

Joan of Arc (French heroine)

MAIN ARTICLE *volume 7 page 25, picture, volume 7 page 25*

MORE TO EXPLORE

France *volume 5 page 59*
 Inquisition *volume 6 page 137*

joey (kangaroo)

kangaroo *volume 7 page 46*
 marsupial *picture, volume 8 page 63*

John (king of England)

bill of rights *volume 2 page 70*

Magna Carta *volume 8 page 17*

England *volume 4 page 141*

signing the Magna Carta *picture, volume 8 page 17*

John, Revelation to (New Testament): *see in index* Revelation, Book of

John, Saint (Christian Apostle): *see in index* John the Apostle, Saint

John Brown's raid (U.S. history): *see in index* Harpers Ferry Raid

John Deere-Delaware Company (U.S. company): *see in index* Deere & Company

John Pennekamp Coral Reef State Park (park in Florida, U.S.)

Florida Keys *volume 5 page 37*

Johnson, Andrew (president of the U.S.)

MAIN ARTICLE *volume 7 page 26, picture, volume 7 page 26*

MORE TO EXPLORE

Reconstruction *volume 11 page 33*
 timeline *volume 7 page 26*

Johnson, Earvin, Jr. (U.S. athlete): *see in index* Johnson, Magic

Johnson, Jack (U.S. boxer)

MAIN ARTICLE *volume 7 page 27, picture, volume 7 page 27*

Johnson, Louisa Catherine (first lady of the U.S.): *see in index* Adams, Louisa

Johnson, Lyndon B. (president of the U.S.)

MAIN ARTICLE *volume 7 page 28, picture, volume 7 page 28*

MORE TO EXPLORE

Marshall *volume 8 page 61*

timeline *volume 7 page 28*

Vietnam War *volume 14 page 87*

Johnson, Magic (U.S. athlete)

MAIN ARTICLE *volume 7 page 30, picture, volume 7 page 30*

Johnson-Sirleaf, Ellen (president of Liberia) *picture, volume 7 page 139*

Johnson Space Center (building in Houston, Texas, U.S.): *see in index* Lyndon B. Johnson Space Center

John the Apostle, Saint (Christian Apostle)

painting by El Greco *picture, volume 5 page 150*

“Join, or Die” (first American cartoon by Franklin) *picture, volume 1 page 67*

joint (anatomy)

arthritis *volume 1 page 191*

Joliot-Curie, Frédéric (French chemist)
Curie family *volume 3 page 232*

Joliot-Curie, Irène (French chemist)
Curie family *volume 3 page 232*

Jolliet, Louis (French-Canadian explorer)
MAIN ARTICLE *volume 7 page 31, picture, volume 7 page 31*

MORE TO EXPLORE

Illinois *volume 6 page 118*

Marquette *volume 8 page 57, picture, volume 8 page 57*

Mississippi River *volume 8 page 145*

Jolly Roger (flag)

pirate *volume 10 page 88*

Jones, Bobby (U.S. golfer)
golf *volume 5 page 126*

Jones, Brian (British balloonist)
balloon *volume 2 page 16*

Jones, John Paul (U.S. naval officer)
MAIN ARTICLE *volume 7 page 31, picture, volume 7 page 32, picture, volume 7 page 32*

Jordan (country in the Middle East)

MAIN ARTICLE *volume 7 page 33*

MORE TO EXPLORE

geography

Middle East *volume 8 page 124*

Petra *picture, volume 7 page 34*

Roman theater *picture, volume 1 page 108*

history

Israel *volume 6 page 169*

Jerusalem *volume 7 page 22*

Queen Rania *picture, volume 7 page 34*

Jordan, Michael (U.S. athlete)

MAIN ARTICLE *volume 7 page 35, picture, volume 7 page 35*

Jordan River (river in the Middle East)

MAIN ARTICLE *volume 7 page 36, picture, volume 7 page 36*

MORE TO EXPLORE

Israel *volume 6 page 168*

Jordan *volume 7 page 33*

Joseph, Chief (Nez Percé chief) *picture, volume 9 page 63*

journal (publication): *see in index* magazine

Jovian planet (astronomy): *see in index*
gas giant

Joyce, James (Irish author)
literature *volume 7 page 162*

joystick (computer device)
electronic games *volume 4 page 122*

Jr. (son with same name as his father): *see in index* Junior

Juan Carlos (king of Spain)
Spain *volume 12 page 156*

Juárez, Benito (president of Mexico)
Mexico *volume 8 page 112*

Judaism (religion)

MAIN ARTICLE *volume 7 page 36*

MORE TO EXPLORE

calendar *picture, volume 3 page 10*
festivals

Passover *volume 10 page 39*

Rosh Hashana *volume 11 page 98, picture, volume 11 page 98*

history

Abraham *volume 1 page 13*

Jesus Christ *volume 7 page 22*

martyr *volume 8 page 67*

important places

Israel *volume 6 page 169*

Jerusalem *volume 7 page 21*

Palestine *volume 10 page 17*

major world religions *table, volume 11 page 43*

sacred writings

Bible *volume 2 page 67*

Talmud *picture, volume 13 page 14*

Torah *picture, volume 13 page 82*

synagogue *volume 12 page 222*

ark *picture, volume 12 page 222*

service *picture, volume 7 page 38*

yarmulkes *picture, volume 7 page 37*

Judas Iscariot (Apostle)

Jesus Christ *volume 7 page 23*

judicial branch (government)

United States government *volume 14 page 35*

judicial review (law)

United States government *volume 14 page 36*

judiciary (government): *see in index* judicial branch

judo (martial art)

martial arts *volume 8 page 65*

juice (sugar)

sugar *volume 12 page 202*

Julian Alps (mountain range in Europe)
Slovenia *picture, volume 12 page 110*

Julian calendar

calendar *volume 3 page 10*

Julijske Alpe (mountain range in Europe): *see in index* Julian Alps

Julius II (pope)

Michelangelo *volume 8 page 115*

July, Fourth of (United States holiday):
see in index Independence Day

jump (ice skating)

figure skating *picture, volume 6 page 110*

jumping (athletics)

track and field *volume 13 page 86*

Juneau (state capital of Alaska, U.S.)

MAIN ARTICLE *volume 7 page 39, picture, volume 7 page 39*

MORE TO EXPLORE

Alaska *volume 1 page 63*

jungle fowl (bird)chicken *volume 3 page 95***Junior** (son with same name as his father)common abbreviations *table, volume 1 page 8***junior high school:** *see in index* secondary education**juniper** (tree and shrub)MAIN ARTICLE *volume 7 page 40, picture, volume 7 page 40***Juno** (Roman goddess)Hera *volume 6 page 43***Jupiter** (planet)MAIN ARTICLE *volume 7 page 40, picture, volume 7 page 41*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*solar system *volume 12 page 127, picture, volume 12 page 127***Jupiter** (Roman god)Zeus *volume 15 page 104***Jurassic period** (geochronology)dinosaur *picture, volume 4 page 53***jurisprudence:** *see in index* law**Justice, Department of** (U.S. government agency)United States government executive departments *table, volume 14 page 35***Justinian I** (Byzantine emperor)Byzantine Empire *volume 2 page 159***Jute** (people)Anglo-Saxon *volume 1 page 121***jute** (plant)Bangladesh *volume 2 page 21***Jutland** (region in Denmark)Denmark *volume 4 page 36***K2** (mountain in Asia) *picture, volume 7 page 50*Karakoram Range *volume 7 page 50***Kaaba** (shrine in Mecca, Saudi Arabia): *see in index* Ka'bah**Kaap, De** (legislative capital city of South Africa): *see in index* Cape Town**Kaapstad** (legislative capital city of South Africa): *see in index* Cape Town**Ka'bah** (shrine in Mecca, Saudi Arabia)Abraham *volume 1 page 14*Mecca *volume 8 page 90*Haram Mosque, al- *picture, volume 8 page 91*pilgrimage *volume 10 page 85***Kabila, Laurent** (president of the Democratic Republic of the Congo)
Democratic Republic of the Congo
*volume 3 page 180***Kabul** (capital city of Afghanistan): *see in index* Kabul**Kabre** (people)Togo *volume 13 page 74***Kabuki** (Japanese arts)Kabuki performance *picture, volume 7 page 13*theater *volume 13 page 59***Kabul** (capital city of Afghanistan)MAIN ARTICLE *volume 7 page 43*

MORE TO EXPLORE

Afghanistan *volume 1 page 36*outdoor theater *picture, volume 13 page 59*Sakhy Shrine *picture, volume 7 page 43***Kadr, Lailat al** (Islam): *see in index* Night of Power**Kagera River** (river in Africa)Lake Victoria *volume 14 page 79***Kahlo, Frida** (Mexican painter)MAIN ARTICLE *volume 7 page 43, picture, volume 7 page 43*

MORE TO EXPLORE

Mexico City *volume 8 page 114*Rivera *volume 11 page 69***Kaiser Wilhelm** (emperor of Germany): *see in index* William II**Kalaallit Nunaat** (island and dependency of Denmark): *see in index* Greenland**Kalahari** (desert region in Africa)MAIN ARTICLE *volume 7 page 44, picture, volume 7 page 44*

MORE TO EXPLORE

Botswana *volume 2 page 116*Namibia *volume 9 page 6***kale** (vegetable)cabbage *volume 3 page 4***Kamehameha I** (king of Hawaii)Hawaii *volume 6 page 27***kami** (divine or sacred power)Shinto *volume 12 page 80***Kampala** (capital city of Uganda)MAIN ARTICLE *volume 7 page 45*

MORE TO EXPLORE

Uganda *volume 14 page 4***Kampuchea** (country in Southeast Asia): *see in index* Cambodia**Kanawha River** (river in West Virginia, U.S.)Charleston *picture, volume 3 page 83***Kandinsky, Wassily** (Russian artist)painting *volume 10 page 11***Kanem-Bornu Empire** (historical empire in western Africa)MAIN ARTICLE *volume 7 page 45*

MORE TO EXPLORE

Chad *volume 3 page 78*Niger *volume 9 page 67***Kangaba** (West African kingdom)Mali empire *volume 8 page 33***kangaroo** (mammal)MAIN ARTICLE *volume 7 page 46, picture, volume 7 page 46*

MORE TO EXPLORE

crossing sign *picture, volume 11 page 10*marsupial *volume 8 page 63***Kankan Musa** (emperor of Mali): *see in index* Musa

Kansa (Native American people): *see in index* Kaw

Kansas (state in the U.S.)

MAIN ARTICLE *volume 7 page 47, picture, volume 7 page 47, picture, volume 7 page 48*

MORE TO EXPLORE

history

American Civil War *volume 1 page 95*

Kansas-Nebraska Act *volume 7 page 49*

Kaw *volume 7 page 51*

Kansas City (city in Kansas, U.S.)

Kansas *volume 7 page 47*

Kansas City Monarchs (U.S. baseball team)

Robinson *volume 11 page 73*

Kansas-Nebraska Act (U.S. legislation, 1854)

MAIN ARTICLE *volume 7 page 49, picture, volume 7 page 49*

MORE TO EXPLORE

American Civil War *volume 1 page 95*

Kansas *volume 7 page 48*

Missouri Compromise *volume 8 page 148*

Nebraska *volume 9 page 29*

Pierce *volume 10 page 81*

slavery *volume 12 page 107*

Kanyenkehaka (Native American people): *see in index* Mohawk

Kapoor, Anish (Indian-born sculptor)
sculpture in Chicago *picture, volume 3 page 92*

Karakoram Range (mountain range in central Asia)

MAIN ARTICLE *volume 7 page 49, picture, volume 7 page 50*

Karakul (breed of sheep)

Namibia *volume 9 page 7*

Karakum Desert (desert in Turkmenistan)

Turkmenistan *volume 13 page 115*

karate (martial art) *picture, volume 8 page 65*

martial arts *volume 8 page 65*

Karenga, Maulana (U.S. educator)

Kwanzaa *volume 7 page 93*

Kariba, Lake (lake in Africa)

Zimbabwe *picture, volume 15 page 105*

Karisimbi, Mount (mountain in Central Africa)

Virunga Mountains *volume 14 page 97*

kasbah (fortress): *see in index* casbah

Kashmir (region in the Indian subcontinent)

Pakistan *volume 10 page 13*

Kashmir goat (breed of goat)

goat *volume 5 page 122*

Mongolia *volume 8 page 164*

Kashyapamar (region in the Indian subcontinent): *see in index* Kashmir

Kasparov, Garry (Russian chess player)
match against Deep Junior *picture, volume 1 page 195*

Kaspi (ancient people)

Caspian Sea *volume 3 page 51*

Kasumigaseki (district in Tokyo, Japan)

Tokyo *volume 13 page 76*

Kathmandu (capital city of Nepal)

MAIN ARTICLE *volume 7 page 50*

MORE TO EXPLORE

Durbar Square *picture, volume 7 page 50*

market *picture, volume 9 page 32*

Nepal *volume 9 page 31*

“Katrina” (storm): *see in index* Hurricane Katrina

Kaw (Native American people)

MAIN ARTICLE *volume 7 page 51, picture, volume 7 page 51*

MORE TO EXPLORE

Osage *volume 9 page 152*

kayak (watercraft)

boat *volume 2 page 98*

Kazak (Russian and Ukrainian people):
see in index Cossack

Kazakh (Central Asian people)

Kazakhstan *volume 7 page 52*

Mongolia *volume 8 page 163*

nomad *volume 9 page 76*

Kazakhstan (country in Central Asia)

MAIN ARTICLE *volume 7 page 52*

MORE TO EXPLORE

women dressed in traditional costume
picture, volume 7 page 52

Keb (Egyptian god): *see in index* Geb

keel (watercraft part)

boat *volume 2 page 97, picture, volume 2 page 97*

ship *volume 12 page 81*

keep (military architecture)

castle *volume 3 page 52, picture, volume 3 page 53*

Keetoowah (Native American people): *see in index* Cherokee

Keller, Helen (U.S. author and educator)

MAIN ARTICLE *volume 7 page 53, picture, volume 7 page 53, picture, volume 7 page 53*

Kellogg-Briand Pact (French-U.S. history, 1928)

Coolidge *volume 3 page 195*

Kelly, Elisha (American settler)

Springfield *volume 12 page 169*

kelp (seaweed)

algae *volume 1 page 77*

Kemal, Mustafa (president of Turkey): *see in index* Atatürk, Kemal

kendo (martial art)

martial arts *volume 8 page 64*

Kennebec River (river in Maine, U.S.)

Augusta, Maine *picture, volume 1 page 226*

Kennedy, Eunice (U.S. philanthropist):
see in index Shriver, Eunice Kennedy

Kennedy, Jacqueline (first lady of the U.S.)

Kennedy, John F. *volume 7 page 54*

Kennedy, John F. (president of the U.S.)

MAIN ARTICLE *volume 7 page 54*

MORE TO EXPLORE

Johnson *volume 7 page 29*

Peace Corps *volume 10 page 43*

timeline *volume 7 page 54*

Kentucky (state in the U.S.)

MAIN ARTICLE *volume 7 page 56*

MORE TO EXPLORE

Boone *volume 2 page 111*

geography

horse farms near Lexington *picture, volume 7 page 57*

Louisville *picture, volume 7 page 56*

State Capitol *picture, volume 5 page 63*

Kentucky Derby (horse race) *picture*,
volume 6 page 87

Kenya (country in Africa)
MAIN ARTICLE volume 7 page 58

MORE TO EXPLORE

geography

Nairobi *picture*, volume 9 page 5

savanna *picture*, volume 5 page 143

wildlife

African wood stork *picture*, volume 12
page 191

anubis baboon *picture*, volume 8
page 168

cheetah *picture*, volume 3 page 84

impala *picture*, volume 7 page 59

workers drying coffee in Kenya *picture*,
volume 7 page 58

Kenya, Mount (volcanic mountain in
Kenya)
Kenya volume 7 page 58

Keokuk (Sauk leader)
Black Hawk volume 2 page 86

Kepler, Johannes (German astronomer)
astronomy volume 1 page 215

keratin (protein)
feather volume 5 page 8
hoof volume 6 page 80
horn volume 6 page 85
nail and claw volume 9 page 4

Kérékou, Mathieu (president of Benin)
Benin volume 2 page 60

Kere-Nyaga (volcanic mountain in
Kenya): *see in index* Kenya, Mount

kernel (botany)
wheat volume 15 page 39

kestrel (bird)
birds volume 2 page 78
falcon volume 5 page 4, *picture*, vol-
ume 5 page 5

Ketuvim (biblical text): *see in index* Writ-
ings

Keukenhof Gardens (Lisse, Netherlands)
purple flowers *picture*, volume 5 page 87

Key, Francis Scott (U.S. lawyer)
MAIN ARTICLE volume 7 page 60

MORE TO EXPLORE

national anthem volume 9 page 12

first printed music sheet *picture*, vol-
ume 7 page 60

War of 1812 volume 15 page 13

keyboard instrument (music) *picture*,
volume 8 page 217
music volume 8 page 213
musical instruments volume 8
page 217

Key Largo (island in Florida, U.S.)
Florida Keys volume 5 page 37

keypad (computer device)
electronic games volume 4 page 122

Keys (island chain in Florida, U.S.): *see in*
index Florida Keys

Keystone Province (province in Canada):
see in index Manitoba

Keystone State (state in the U.S.): *see in*
index Pennsylvania

Key West (island and city in Florida,
U.S.)
Florida volume 5 page 34
Florida Keys volume 5 page 37
western keys of Key West *picture*, vol-
ume 5 page 37

kg (measurement): *see in index* kilogram

Kgalagadi Transfrontier Park (nature
conservation area in Africa)
springbok antelope *picture*, volume 7
page 44

KGB (Soviet agency)
spy volume 12 page 170

Khalifah family (Bahraini dynasty)
Bahrain volume 2 page 9

Khalkha (people)
Mongolia volume 8 page 163

Khalsa (Sikhism)
Sikhism volume 12 page 88

Khamenei, Ali (rahbar of Iran)
Iran volume 6 page 149

Khartoum (capital city of The Sudan)
MAIN ARTICLE volume 7 page 61

MORE TO EXPLORE

Khartoum mosque *picture*, volume 7
page 61
Sudan volume 12 page 199

Khasneh (tomb at Petra in Jordan): *see in*
index Treasury

Khiva (city in Uzbekistan)
Ichan-Kala *picture*, volume 14 page 47

Khmer (people)
Cambodia volume 3 page 17
Thailand volume 13 page 55

Khmer, Kingdom of (historical kingdom
in Indochina)
Angkor Wat volume 1 page 120
Cambodia volume 3 page 18

Khmer Republic (country in Southeast
Asia): *see in index* Cambodia

Khmer Rouge (political group in Cam-
bodia)
Cambodia volume 3 page 18
Phnom Penh volume 10 page 74

Khomeini, Ayatollah Ruhollah (Iranian
leader)
Iran volume 6 page 149
Iran-Iraq War volume 6 page 150

Khor Virap (monastery in Armenia) *pic-
ture*, volume 1 page 184

Khrushchev, Nikita (premier of the
Soviet Union)
Soviet Union volume 14 page 14

Khufu, Great Pyramid of (pyramid in
Egypt): *see in index* Great Pyramid

Khwarizmi, al- (Arab astronomer and
mathematician)
MAIN ARTICLE volume 7 page 61, *picture*,
volume 7 page 62

MORE TO EXPLORE

mathematics volume 8 page 77

Kibo (volcano in Tanzania)
Mount Kilimanjaro volume 7 page 65

kickoff (sports)
football volume 5 page 48

kicktail (skateboarding)
skateboarding volume 12 page 94

kid (human): *see in index* child

kidney (anatomy)
MAIN ARTICLE volume 7 page 62

MORE TO EXPLORE

cardiovascular system volume 3 page 39
urinary system volume 14 page 40, *pic-
ture*, volume 14 page 40, *picture*, vol-
ume 14 page 41

kidney stone (medical disorder)
kidney volume 7 page 63

Kiev (capital city of Ukraine)
MAIN ARTICLE volume 7 page 63

MORE TO EXPLORE

Church of Saint Andrew *picture, volume 7 page 63*
 Ukraine *volume 14 page 6*

Kievan Rus (ancient state in Europe)

Kiev *volume 7 page 64*
 Russia *volume 11 page 106*
 Ukraine *volume 14 page 7*

Kigali (capital city of Rwanda)

MAIN ARTICLE *volume 7 page 64*

MORE TO EXPLORE

market *picture, volume 7 page 64*
 Rwanda *volume 11 page 110*

Kilauea (volcano in Hawaii, U.S.) *picture, volume 6 page 27*

Hawaii *volume 6 page 26*

Kilimanjaro, Mount (mountain in Tanzania)

MAIN ARTICLE *volume 7 page 65, picture, volume 1 page 38, picture, volume 7 page 65*

MORE TO EXPLORE

Tanzania *volume 13 page 15*

killer whale (whale) *picture, volume 1 page 154*

whale species *picture, volume 15 page 37*

Killing Fields (Cambodian history)

Cambodia *volume 3 page 18*

kiln (oven)

brick and tile *volume 2 page 128*
 pottery *volume 10 page 140*

kilogram (measurement)

common abbreviations *table, volume 1 page 8*
 cylinder used as standard *picture, volume 8 page 88*

kilometer (measurement)

common abbreviations *table, volume 1 page 8*

Kim Il-sung (president of North Korea)

statue *picture, volume 10 page 170*

Kinderdijk (village in The Netherlands)

windmills *picture, volume 9 page 38*

kinesthesia (sensory phenomenon)

senses *volume 12 page 69*

kinetic energy (physics)

energy *volume 4 page 137*

king (insect caste)

termite *volume 13 page 48*

King (in titles of rulers): *see in index under the personal name, for example, for King Arthur see Arthur except as found below*

King, B. B. (U.S. blues musician) *picture, volume 2 page 95*

King, Coretta Scott (U.S. civil-rights activist)
 King *volume 7 page 66*

King, Leslie Lynch, Jr. (president of the U.S.): *see in index Ford, Gerald R.*

King, Martin Luther, Jr. (U.S. religious and civil-rights activist)
 MAIN ARTICLE *volume 7 page 65, picture, volume 7 page 66*

MORE TO EXPLORE

African Americans *volume 1 page 44*
 assassination *volume 1 page 211*
 Atlanta *volume 1 page 220*
 civil rights movement *volume 3 page 130*
 Abernathy *volume 1 page 9*
 Alabama *volume 1 page 61*
 Montgomery *volume 8 page 177*

king cobra (snake)
 cobras *volume 3 page 145*

kingdom (scientific group of living things) *picture, volume 7 page 168*
 living thing *volume 7 page 169*

Kingdom Centre (building in Riyadh, Saudi Arabia) *picture, volume 12 page 45*

Kingdom of Denmark (country in Europe): *see in index Denmark*

Kingdom of Khmer (historical kingdom in Indochina): *see in index Khmer, Kingdom of*

Kingdom of Lesotho (country in Africa): *see in index Lesotho*

Kingdom of Serbs, Croats, and Slovenes (historical kingdom in Europe, 1918-29): *see in index Serbs, Croats, and Slovenes, Kingdom of*

Kingdom of Yugoslavia (historic country in Europe, 1929-41): *see in index Yugoslavia*

kingfisher (bird)

MAIN ARTICLE *volume 7 page 67, picture, volume 7 page 67*

“King of Rock and Roll” (U.S. singer): *see in index Presley, Elvis*

King Philip (Wampanoag chief): *see in index Metacom*

King Philip’s War (British-Native American conflict, 1675-76)

MAIN ARTICLE *volume 7 page 67, picture, volume 7 page 67*

MORE TO EXPLORE

Massachusetts *volume 8 page 70*
 Massasoit *volume 8 page 75*
 Metacom *volume 8 page 105*
 Narraganset *volume 9 page 10*
 Nipmuc *volume 9 page 73*
 Wampanoag *volume 15 page 7*

Kings, Divine Right of (political doctrine): *see in index Divine Right of Kings*

Kings, Valley of the (archaeological site in Egypt)
 Tutankhamen *volume 13 page 119*

king salmon (fish)
 salmon *volume 12 page 22*

king snake (reptile): *see in index eastern king snake*

Kingston (capital city of Jamaica)

MAIN ARTICLE *volume 7 page 68*

MORE TO EXPLORE

Devon House *picture, volume 7 page 68*
 Jamaica *volume 7 page 10*

Kingstown (capital city of Saint Vincent and the Grenadines)

MAIN ARTICLE *volume 7 page 69*

MORE TO EXPLORE

Saint Vincent and the Grenadines *volume 12 page 18*

Kinshasa (capital city of the Democratic Republic of the Congo)

MAIN ARTICLE *volume 7 page 69*

MORE TO EXPLORE

Democratic Republic of the Congo *volume 3 page 179*
 shop in Kinshasa *picture, volume 7 page 69*

Kiowa (Native American people)

MAIN ARTICLE *volume 7 page 70*

MORE TO EXPLORE

Elk Tongue *picture, volume 7 page 70*

Kipchak Khanate (western part of the Mongol Empire): *see in index* Golden Horde

Kiribati (island country in the Pacific Ocean)

MAIN ARTICLE *volume 7 page 71*, *picture, volume 7 page 71*

MORE TO EXPLORE

Tarawa Atoll *picture, volume 2 page 10*

Kirinyaga (volcanic mountain in Kenya): *see in index* Kenya, Mount

Kiritimati Atoll (island in Kiribati)
Kiribati *volume 7 page 71*

Kirov Ballet (Russian ballet company)
ballet *volume 2 page 15*

Kishinev (capital of Moldova): *see in index* Chisinau

“**kissing disease**” (disease): *see in index* mononucleosis

kitchen cabinet (U.S. presidential politics)
Jackson *volume 7 page 6*

kite (flying device)
MAIN ARTICLE *volume 7 page 72*, *picture, volume 1 page 51*, *picture, volume 7 page 72*

kite flying (sport) *picture, volume 1 page 51*
kite *picture, volume 7 page 72*

Kitty Hawk (town in North Carolina, U.S.)
Wright brothers *volume 15 page 76*

kiwi (bird) *picture, volume 2 page 79*
flightless birds *volume 2 page 79*
New Zealand *volume 9 page 61*

kiwi (fruit)
fruit *picture, volume 5 page 72*

Kiyomizu Temple (temple in Kyoto, Japan) *picture, volume 1 page 203*

KKK (terrorist organization in the U.S.): *see in index* Ku Klux Klan

KLA (political organization in Serbia): *see in index* Kosovo Liberation Army

Klamath (Native American people)
MAIN ARTICLE *volume 7 page 72*
MORE TO EXPLORE

Klamath woman preparing food *picture, volume 7 page 73*

Klavier (musical instrument): *see in index* piano

Klondike gold rush (Canadian history)
Yukon *volume 15 page 98*
Yukon River *volume 15 page 96*

Klondike River (river in Yukon, Canada)
Yukon River *volume 15 page 96*

km (measurement): *see in index* kilometer

knee (anatomy)
MAIN ARTICLE *volume 7 page 73*, *picture, volume 7 page 73*
MORE TO EXPLORE
knee joint in cross section *picture, volume 12 page 97*

kneecap (bone): *see in index* patella

Knesset (Israeli parliament)
legislature *volume 7 page 124*

Knickerbocker Base Ball Club (U.S. organization)
baseball *volume 2 page 32*

knight (medieval practice and honorific rank)
MAIN ARTICLE *volume 7 page 74*, *picture, volume 7 page 74*
MORE TO EXPLORE
Arthurian legend *picture, volume 1 page 193*
feudalism *volume 5 page 14*
Middle Ages *volume 8 page 122*

kighthood (medieval practice and honorific rank): *see in index* knight

kighthood, orders of: *see in index* orders of kighthood

Knights of the Round Table (legendary group of knights): *see in index* Round Table, Order of the

knitted cloth (textile)
knitting *volume 7 page 75*

knitting (textile)
MAIN ARTICLE *volume 7 page 75*, *picture, volume 7 page 75*

knitting needle
knitting *volume 7 page 75*, *picture, volume 7 page 75*

knockout (boxing)
boxing *volume 2 page 118*

Knossos (ancient city in Crete, Greece)
Aegean civilization *volume 1 page 33*

Know-Nothing party (historical U.S. political party)
Fillmore *volume 5 page 21*

Knox, John (Scottish religious leader)
Reformation *volume 11 page 39*

KO (boxing): *see in index* knockout

koala (mammal)
MAIN ARTICLE *volume 7 page 75*, *picture, volume 7 page 76*
MORE TO EXPLORE
eucalyptus *volume 4 page 158*
marsupial *volume 8 page 64*

København (capital city of Denmark): *see in index* Copenhagen

Kodiak bear (mammal)
bear *volume 2 page 42*

Koguryo (ancient kingdom in Korea)
North Korea *volume 7 page 80*
Pyongyang *volume 10 page 170*
South Korea *volume 7 page 83*

koi (fish) *picture, volume 3 page 42*

kolkhoz (Soviet agriculture): *see in index* collective farm

Komodo dragon (lizard) *picture, volume 7 page 169*
Indonesia *volume 6 page 130*
lizard *volume 7 page 170*
reptile *volume 11 page 51*

Konakry (capital city of Guinea): *see in index* Conakry

Kongfuzi (Chinese teacher and philosopher): *see in index* Confucius

Kongo (African people)
Republic of the Congo *volume 3 page 181*

Kongo kingdom (historical kingdom in Africa)
Angola *volume 1 page 123*
Congo *volume 3 page 181*

Konigsburg, E. L. (U.S. author)
MAIN ARTICLE *volume 7 page 76*

Konza (Native American people): *see in index* Kaw

Kool Herc (U.S. deejay)
rap *volume 11 page 26*

Kooning, Willem de (U.S. artist): *see in index* de Kooning, Willem

Kootenai (Native American people)

MAIN ARTICLE *volume 7 page 77*, *picture*, *volume 7 page 77*

Korab, Mount (mountain in Albania and Macedonia)

Albania *volume 1 page 65*

Koran

MAIN ARTICLE *volume 7 page 77*

MORE TO EXPLORE

images

book restoration *picture*, *volume 2 page 109*

hand-written decorated page *picture*, *volume 7 page 78*

student in Ibadan, Nigeria *picture*, *volume 9 page 68*

woman reading the Koran *picture*, *volume 7 page 78*

Islam *volume 6 page 163*

Muhammad *volume 8 page 202*

Ramadan *volume 11 page 25*

Kordestan (region in Asia): *see in index*
Kurdistan

Korea, North (country in Asia)

MAIN ARTICLE *volume 7 page 79*

MORE TO EXPLORE

geography

Asia *volume 1 page 200*

Mount Paektu *picture*, *volume 7 page 81*

history

Korean War *volume 7 page 85*

South Korea *volume 7 page 84*

timeline *volume 7 page 79*

people and culture

festival in Pyongyang *picture*, *volume 7 page 80*

Red Cross *picture*, *volume 11 page 36*

statue of Kim Il-sung *picture*, *volume 10 page 170*

Korea, South (country in Asia)

MAIN ARTICLE *volume 7 page 82*

MORE TO EXPLORE

geography

Asia *volume 1 page 200*

Seoul *picture*, *volume 7 page 82*

history

first Asian astronomical observatory *picture*, *volume 7 page 83*

Korean War *volume 7 page 85*

North Korea *volume 7 page 81*

traditional Korean clothes *picture*, *volume 7 page 83*

Red Cross workers *picture*, *volume 11 page 36*

Korean (people)

North Korea *volume 7 page 79*

South Korea *volume 7 page 82*

Korean War (1950-53)

MAIN ARTICLE *volume 7 page 85*

MORE TO EXPLORE

Cold War *volume 3 page 151*

North Korea *volume 7 page 81*

refugee *volume 11 page 41*

South Korea *volume 7 page 84*

Truman *volume 13 page 101*

United States *volume 14 page 31*

Koror Island (island in Palau)

Palau *volume 10 page 16*

Koryo dynasty (Korean history)

North Korea *volume 7 page 81*

South Korea *volume 7 page 84*

Kosciusko, Mount (mountain in New

South Wales, Australia)

Australia *volume 1 page 229*

New South Wales *volume 9 page 53*

Kosovo (self-declared independent country in Europe)

MAIN ARTICLE *volume 7 page 86*

MORE TO EXPLORE

Albania *volume 1 page 66*

Serbia *volume 12 page 72*

Kosovo Liberation Army (political organization in Serbia)

Kosovo *volume 7 page 86*

Kotte (historical capital city of Sri

Lanka): *see in index* Sri Jayewardenepura Kotte

Kourou (town in French Guiana)

French Guiana *volume 5 page 67*

Kozhikode (city in India)

Gama *volume 5 page 83*

Krak des Chevaliers (fortress in Syria)

picture, *volume 12 page 224*

kraken (legendary sea monster)

legendary animals *volume 1 page 128*

Kravitz, Lenny (U.S. musician) *picture*,

volume 11 page 78

Kremer, Gerard de (Flemish cartographer): *see in index* Mercator, Gerardus

kremlin (Russian fortress)

MAIN ARTICLE *volume 7 page 87*

Kremlin, The (building complex in Moscow, Russia) *picture*, *volume 7, page 87*

history of kremlins *volume 7 page 87*

Moscow *volume 8 page 186*

Red Square *picture*, *volume 8 page 186*

krill (marine animal)

MAIN ARTICLE *volume 7 page 87*, *picture*, *volume 7 page 87*

Kristallnacht (German history)

Holocaust *volume 6 page 71*

Kristianstad (city in Sweden)

castle *picture*, *volume 12 page 212*

Kronos (Greek mythology): *see in index*
Cronus

Krujë (city in Albania)

citadel *picture*, *volume 1 page 65*

Krung Thep (capital city of Thailand): *see in index* Bangkok

Kuala Lumpur (capital city of Malaysia)

MAIN ARTICLE *volume 7 page 88*

MORE TO EXPLORE

Malaysia *volume 8 page 27*

Petronas Twin Towers *picture*, *volume 7 page 88*

Kubango River (river in Africa): *see in index* Okavango River

Kublai Khan (emperor of Yuan dynasty)

Beijing *volume 2 page 50*

Mongol Empire *volume 8 page 162*

Polo *volume 10 page 119*

kudu (mammal)

antelope *volume 1 page 138*

Kuiper Belt (astronomy)

solar system *volume 12 page 128*, *picture*, *volume 12 page 127*

Ku Klux Klan (terrorist organization in the U.S.)

MAIN ARTICLE *volume 7 page 88*

MORE TO EXPLORE

African Americans *volume 1 page 43*

Reconstruction *volume 11 page 35*

terrorism *volume 13 page 48*

Kumasi (city in Ghana)

Ashanti *volume 1 page 198*

Kumbi (capital city of Ghana Empire)

Ghana Empire *volume 5 page 112*

kung fu (martial art)

martial arts *volume 8 page 65*

Kuomintang (political party in China, 1912-49, and Taiwan, 1949-present): *see in index* Nationalist Party

Kurd (people)

MAIN ARTICLE *volume 7 page 89, picture, volume 7 page 89*

MORE TO EXPLORE

Iraq *volume 6 page 152*

Syria *volume 12 page 223*

Turkey *volume 13 page 112*

Kurdistan (region in Southwest Asia)

Kurds *volume 7 page 89*

Kush (ancient African kingdom)

MAIN ARTICLE *volume 7 page 90*

MORE TO EXPLORE

Nubia *volume 9 page 103*

Sudan *volume 12 page 200*

Kushite (people)

Kush *volume 7 page 90*

Nubia *volume 9 page 103*

kusti (religious dress)

Zoroastrianism *volume 15 page 109*

Kutenai (Native American people): *see in index* Kootenai

Kuwait (country in the Middle East)

MAIN ARTICLE *volume 7 page 91*

MORE TO EXPLORE

history

Bush, George *volume 2 page 155*

Persian Gulf War *volume 10 page 62*

Kuwait city *picture, volume 7 page 91, picture, volume 7 page 92*

Kuwait city (capital city of Kuwait)

MAIN ARTICLE *volume 7 page 92, picture, volume 7 page 92*

MORE TO EXPLORE

Kuwait *volume 7 page 91, picture, volume 7 page 91*

Kwajalein Atoll (island in the Marshall Islands)

Marshall Islands *volume 8 page 62*

Kwakiutl (Native American people)

MAIN ARTICLE *volume 7 page 92*

MORE TO EXPLORE

British Columbia *volume 2 page 132*

Hamasaka, Kwakiutl chief *picture, volume 7 page 93*

Native Americans *volume 9 page 18*

Kwanzaa (African American holiday)

MAIN ARTICLE *volume 7 page 93, picture, volume 7 page 93*

Kyongbokkung Palace (palace in Seoul, South Korea) *picture, volume 12 page 69*

Kyongju (city in South Korea)

first Asian astronomical observatory *picture, volume 7 page 83*

Kyoto (city in Japan)

cherry blossoms *picture, volume 7 page 12*

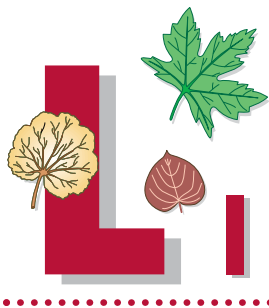
Kyrgyzstan (country in central Asia)

MAIN ARTICLE *volume 7 page 94*

MORE TO EXPLORE

Bishkek *picture, volume 2 page 81*

refugee camp *picture, volume 11 page 39*



l (unit of measure): *see in index* liter

La Beckwith, Byron de (U.S. murderer)

Evers *volume 4 page 169*

labor (work)

MAIN ARTICLE *volume 7 page 96*

MORE TO EXPLORE

economics *volume 4 page 100*

factory work *picture, volume 7 page 97*

May Day *volume 8 page 83*

Middle Ages *picture, volume 7 page 96*

Solidarity *picture, volume 7 page 98*

Labor, American Federation of (labor organization): *see in index* American Federation of Labor

Labor, Department of (U.S. government agency)

United States government executive departments *table, volume 14 page 35*

labor, organized: *see in index* organized labor

Labor Day (United States holiday)

MAIN ARTICLE *volume 7 page 98*

MORE TO EXPLORE

parade *picture, volume 7 page 99*

labor force (work): *see in index* labor

labor law

Industrial Revolution *volume 6 page 134*

labor movement

capitalism *volume 3 page 34*

Chavez *volume 3 page 84*

Illinois *volume 6 page 118*

manufacturing *volume 8 page 46*

trade *volume 13 page 89*

Labors of Heracles (classical mythology): *see in index* Heracles, Labors of

Labors of Hercules (classical mythology): *see in index* Heracles, Labors of

labor union: *see in index* organized labor

labour law: *see in index* labor law

labour movement: *see in index* labor movement

Labrador (region in Newfoundland and Labrador province in Canada) *Newfoundland and Labrador volume 9 page 45*

labyrinth of the ear (anatomy): *see in index* inner ear

lace (decorative fabric)

MAIN ARTICLE *volume 7 page 99, picture, volume 7 page 99, picture, volume 7 page 100*

Lacedaemon (ancient city-state of Greece): *see in index* Sparta

lacrosse (sport)

MAIN ARTICLE *volume 7 page 100, picture, volume 7 page 100*

lactation (biology)

mammal *volume 8 page 36*

polar bear *picture, volume 8 page 35*

ladder truck (fire truck)

firefighting *volume 5 page 26*

Ladino (people)

Guatemala *volume 5 page 166*

Ladrones (island and U.S. territory in the Pacific Ocean): *see in index* Guam

ladybug (insect)

ladybug and eggs *picture, volume 4 page 108*

Lady of the Lamp (English nurse): *see in index* Nightingale, Florence

Lafayette, Marquis de (French soldier and nobleman)
 MAIN ARTICLE *volume 7 page 101, picture, volume 7 page 101*

La Fontaine, Jean de (French poet)
 fable *volume 5 page 4*

lagoon (geography)
 coral-reef lagoon *picture, volume 6 page 167*

Lagoon Nebula (astronomy) *picture, volume 9 page 30*

Lagos (city in Nigeria)
 Abuja *volume 1 page 16*

Lailat al Kadr (Islam): *see in index* Night of Power

laissez-faire (economic policy)
 capitalism *volume 3 page 34*
 trade *volume 13 page 89*

lake (physical feature)
 MAIN ARTICLE *volume 7 page 102, picture, volume 7 page 102*
 MORE TO EXPLORE
 bog *volume 2 page 99*
 water *volume 15 page 22*

Lake (geographical feature): *see in index under the specific part of the name, for example, Michigan, Lake*

Lakota (Native American people)
 Sioux people *volume 12 page 92*

Lalh Bagh (fort in Dhaka, Bangladesh)
 Dhaka *volume 4 page 42*

Lamaism (religion): *see in index* Tibetan Buddhism

lamb (young sheep)
 ewe with two lambs *picture, volume 12 page 78*

Lambeosaurus (dinosaur)
 dinosaurs in scale *picture, volume 4 page 53*

lamina (plant leaf): *see in index* blade

lamprey (fish)
 MAIN ARTICLE *volume 7 page 103, picture, volume 7 page 103*

Lancaster (city in Nebraska, U.S.): *see in index* Lincoln

land (economic factor)
 economics *volume 4 page 100*

land (physical feature)
 climate *volume 3 page 137*
 tsunami *picture, volume 13 page 104*

landform (geological feature)
 climate *volume 3 page 137*
 geography *volume 5 page 96*
 volcano *volume 14 page 101, picture, volume 14 page 101*

land habitat (biology and ecology)
 habitat *volume 6 page 4*

landing gear (aircraft structure)
 airplane *volume 1 page 55*

land irrigation (agriculture): *see in index* irrigation

Land of 10,000 Lakes (state in the U.S.): *see in index* Minnesota

Land of Enchantment (state in the U.S.): *see in index* New Mexico

Land of Lincoln (state in the U.S.): *see in index* Illinois

land pollution
 pollution *volume 10 page 118*

landscape painting
 painting *volume 10 page 7*

landslide (geology)
 MAIN ARTICLE *volume 7 page 103, picture, volume 7 page 104*
 MORE TO EXPLORE
 avalanche *volume 1 page 238*
 erosion *picture, volume 4 page 152*

language
 MAIN ARTICLE *volume 7 page 104*
 MORE TO EXPLORE
 alphabet *volume 1 page 88*
 child development *picture, volume 7 page 104*
 communication *volume 3 page 167*
 grammar *volume 5 page 135*

language, programming: *see in index* computer programming language

Lansing (state capital of Michigan, U.S.)
 MAIN ARTICLE *volume 7 page 106*
 MORE TO EXPLORE
 Michigan *volume 8 page 116*
 State Capitol *picture, volume 7 page 106*

Lantern Festival (Chinese holiday)
 Chinese New Year *volume 3 page 105*

Lan Xang (historical kingdom in Laos)
 Laos *volume 7 page 107*

Laos (country in Southeast Asia)
 MAIN ARTICLE *volume 7 page 107*

MORE TO EXPLORE

That Luang temple *picture, volume 14 page 83*

Laozi (Chinese philosopher)
 Daoism *volume 4 page 15*

La Paz (administrative capital city of Bolivia)
 MAIN ARTICLE *volume 7 page 108, picture, volume 7 page 108*

MORE TO EXPLORE

Bolivia *volume 2 page 102*
 festival *picture, volume 2 page 102*
 Sucre *volume 12 page 198*

lapis lazuli (gemstone)
 jewelry and gems *volume 7 page 24*

Lapita (people)
 Oceania *volume 9 page 122*

Lapland (region of northern Europe)
 Finland *volume 5 page 23*

La Plata (city in Bolivia): *see in index* Sucre

Lapp (people): *see in index* Sami

lappet-faced vulture (bird)
 vulture *volume 14 page 106*

laptop computer *picture, volume 3 page 172*
 communication over distances *picture, volume 3 page 166*
 computers *volume 3 page 172*
 laptop with webcam *picture, volume 6 page 142*

larch (tree)
 MAIN ARTICLE *volume 7 page 108, picture, volume 7 page 109*

large intestine (anatomy)
 digestive system *volume 4 page 48*
 frog *picture, volume 4 page 48*
 human *picture, volume 4 page 47, picture, volume 6 page 143*
 intestines *volume 6 page 142*

largemouth black bass (fish)
 bass *volume 2 page 37*

larva (biology)
 amphibians *volume 1 page 111*
 salamander *volume 12 page 19*

insects *volume 6 page 139*

flea *volume 5 page 33*

mosquito *volume 8 page 189*

lamprey *volume 7 page 103*

metamorphosis *volume 8 page 107*

larynx (anatomy)

respiratory system *volume 11 page 55*

speech *volume 12 page 162*

La Salle, Sieur de (French explorer)

MAIN ARTICLE *volume 7 page 109*, *picture*, *volume 7 page 109*

MORE TO EXPLORE

Gulf of Mexico *picture*, *volume 1 page 107*

Indiana *volume 6 page 127*

Louisiana Purchase *volume 7 page 182*

Mississippi River *volume 8 page 145*

Ohio River *volume 9 page 127*

la Selle, Mount (mountain in Haiti): *see in index* Selle, Mount

laser

MAIN ARTICLE *volume 7 page 111*, *picture*, *volume 7 page 111*

MORE TO EXPLORE

abbreviation *volume 1 page 9*

compact disc *volume 3 page 170*

hologram *volume 6 page 72*, *picture*, *volume 6 page 73*

laser beam (optics)

laser *volume 7 page 111*, *picture*, *volume 7 page 111*

laser holography (photographic process):

see in index holography

laser light (optics): *see in index* laser beam

laser photography (photographic process): *see in index* holography

Last Frontier (state in the U.S.): *see in index* Alaska

“Last Judgment, The” (fresco by Michelangelo)

Michelangelo *volume 8 page 115*

Last Supper (Christianity)

Easter *volume 4 page 93*

Jesus Christ *volume 7 page 23*

“Last Supper” (fresco by Leonardo da Vinci)

Leonardo da Vinci *volume 7 page 132*, *picture*, *volume 7 page 132*

Renaissance *volume 11 page 46*

Las Vegas (city in Nevada, U.S.)

desert and mountains *picture*, *volume 9 page 41*

Nevada *volume 9 page 41*

Late Cretaceous Epoch (geochronology)

dinosaurs *picture*, *volume 4 page 53*

Late Stone Age (anthropology): *see in index* Neolithic Period

Latifah, Queen (U.S. rapper and actress): *see in index* Queen Latifah

Latin alphabet

alphabet *volume 1 page 89*

ancient Rome *volume 11 page 89*

Latin America (cultural and geographic region)

MAIN ARTICLE *volume 7 page 112*

MORE TO EXPLORE

human migration *volume 8 page 128*

South America *volume 12 page 140*

For more about Latin America, look for articles on these countries:

Argentina

Belize

Bolivia

Brazil

Chile

Colombia

Costa Rica

Cuba

Dominican

Republic

Ecuador

El Salvador

Guatemala

Guyana

Haiti

Honduras

Mexico

Nicaragua

Panama

Paraguay

Peru

Suriname

Uruguay

Venezuela

Latino (people): *see in index* Hispanic American

latitude (geography)

MAIN ARTICLE *volume 7 page 113*

MORE TO EXPLORE

equator *volume 4 page 147*

map and globe *volume 8 page 50*

Latona (Greek mythology): *see in index* Leto

Latvia (country in Europe)

MAIN ARTICLE *volume 7 page 115*

MORE TO EXPLORE

geography

castle in Cesis *picture*, *volume 7 page 115*

Riga *picture*, *volume 11 page 65*

Laura Ingalls Wilder Medal (literary award)

Wilder *volume 15 page 44*

Laurasia (supercontinent)

plate tectonics *volume 10 page 98*

laurel (tree and shrub)

MAIN ARTICLE *volume 7 page 116*

MORE TO EXPLORE

bay laurel leaves *picture*, *volume 7 page 116*

lava (volcanic material)

erupting volcano *picture*, *volume 14 page 99*, *picture*, *volume 14 page 100*

fissure eruption *picture*, *volume 14 page 102*

mountain *volume 8 page 195*

volcano *volume 14 page 99*

lava cave (geology)

cave *volume 3 page 63*

Lavoisier, Antoine (French chemist)

chemistry *volume 3 page 87*

law (rule of conduct or action)

MAIN ARTICLE *volume 7 page 116*

MORE TO EXPLORE

crime *volume 3 page 215*

Navajo Supreme Court *picture*, *volume 5 page 132*

safety *volume 12 page 7*

stone carving of Hammurabi *picture*, *volume 7 page 117*

United States government *volume 14 page 34*

Law, ark of the (Judaism): *see in index* ark

law, court of: *see in index* court

law enforcement: *see in index* police

lawn (garden and landscape)

grass *volume 5 page 142*

lawn tennis (sport): *see in index* tennis

Lawrence (city in Kansas, U.S.)

Kansas-Nebraska Act *volume 7 page 49*

Lawson cypress (tree)

comparison with English elm *picture*, *volume 13 page 94*

lawsuit

law *volume 7 page 117*

layout (publishing)

book and bookmaking *volume 2*
page 108

Lazarus, Emma (U.S. poet)

Statue of Liberty *volume 7* page 140

LCD (electronics)

television *volume 13* page 41

LDL (biochemistry): *see in index* low-density lipoprotein**lead** (chemical element)

poison *volume 10* page 106

lead pencil (writing tool): *see in index* pencil**leaf** (plant part)

MAIN ARTICLE *volume 7* page 117

MORE TO EXPLORE

deciduous *picture, volume 13* page 94

fir *volume 5* page 24, *picture, volume 5*
page 24

natural shapes and arrangements *picture, volume 7* page 118

rhubarb *picture, volume 11* page 62

seed *volume 12* page 62

tree *volume 13* page 95

vegetable *volume 14* page 61

leaf lettuce (vegetable)

lettuce *volume 7* page 135

leaf-nosed bat (mammal) *picture, volume 2* page 146**League for the Independence of Vietnam** (Vietnamese revolutionary organization): *see in index* Viet Minh**League of Nations** (international organization)

MAIN ARTICLE *volume 7* page 119, *picture, volume 7* page 119

MORE TO EXPLORE

peace movements *volume 10* page 44

refugee *volume 11* page 40

United Nations *volume 14* page 23

Wilson *volume 15* page 48

World War I *volume 15* page 65

leap year

calendar *volume 3* page 9

learning

child development *volume 3* page 97

education *volume 4* page 105

least weasel (mammal)

weasel family *volume 15* page 27

leatherback turtle (reptile)

turtle *volume 13* page 117

leaves (plant part): *see in index* leaf**Lebanese Civil War** (Lebanese history)

Beirut *volume 2* page 51

Lebanon *volume 7* page 121

Lebanon (country in the Middle East)

MAIN ARTICLE *volume 7* page 120

MORE TO EXPLORE

geography

Beirut *picture, volume 2* page 51

cedar trees *picture, volume 3* page 65

Middle East *volume 8* page 124

Sidon *picture, volume 7* page 120

history

Israel *volume 6* page 169

Syria *volume 12* page 224

Lebanon, cedar of (tree): *see in index*

cedar of Lebanon

Lebanon, invasion of (Arab-Israeli conflict, 1982-85)

Israel *volume 6* page 170

Le Corbusier (Swiss architect): *see in index*

Corbusier, Le

Ledra (capital city of Cyprus): *see in index*

Nicosia

Lee, Jason (Methodist leader)

Salem *volume 12* page 20

Lee, Richard Henry (U.S. statesman)

Declaration of Independence *volume 4*
page 24

Lee, Robert E. (Confederate general)

MAIN ARTICLE *volume 7* page 122, *picture, volume 7* page 122

MORE TO EXPLORE

American Civil War *volume 1* page 97,
picture, volume 1 page 97

Grant *volume 5* page 137

surrender at Appomattox *picture, volume 1* page 98

Leeward Islands (island group of the West Indies)

West Indies *volume 15* page 32

Lefkosa (capital city of Cyprus): *see in index*

Nicosia

leg (anatomy)

MAIN ARTICLE *volume 7* page 123, *picture, volume 7* page 123

MORE TO EXPLORE

insect anatomy *picture, volume 6*
page 138

knee *picture, volume 7* page 73

legal code (law): *see in index* code**legal system**: *see in index* law**legendary animals**: *see in index* animals, legendary**legislative branch** (government)

government *volume 5* page 132

United States government *volume 14*
page 33

Legislative Hall (building in Dover, Delaware, U.S.) *picture, volume 4* page 68**legislature** (government)

MAIN ARTICLE *volume 7* page 124

MORE TO EXPLORE

Knesset *picture, volume 7* page 124

law *volume 7* page 117

legume (plant)

MAIN ARTICLE *volume 7* page 125

MORE TO EXPLORE

pea pods *picture, volume 7* page 125

legume (plant reproductive body): *see in index* pod**Lei Day** (holiday): *see in index* May Day**Leif Eriksson** (Viking explorer)

MAIN ARTICLE *volume 7* page 125, *picture, volume 7* page 126

MORE TO EXPLORE

North America *volume 9* page 83

lemming (rodent)

MAIN ARTICLE *volume 7* page 126, *picture, volume 7* page 126

lemon (tree and fruit)

MAIN ARTICLE *volume 7* page 127, *picture, volume 7* page 127

MORE TO EXPLORE

citrus fruits *volume 3* page 123

lemur (primate)

MAIN ARTICLE *volume 7* page 128

MORE TO EXPLORE

Madagascar *volume 8* page 9

red-bellied lemur *picture, volume 7*
page 128

Lenape (Native American people): *see in index* Delaware

lending (finance): *see in index* loan

L'Enfant, Pierre-Charles (French engineer and architect)
Washington, D.C. *volume 15 page 18*

L'Engle, Madeleine (U.S. author)
MAIN ARTICLE *volume 7 page 128, picture, volume 7 page 129*

length (measured distance)
measurement *volume 8 page 88*

Lenin, Vladimir Ilich (prime minister of the Soviet Union)
MAIN ARTICLE *volume 7 page 129, picture, volume 7 page 129*
MORE TO EXPLORE
Russian Revolution *volume 11 page 108*
Soviet Union *volume 14 page 13*
speaking to crowd *picture, volume 14 page 13*
Stalin *volume 12 page 176*

Leningrad (city in Russia): *see in index* Saint Petersburg

Lenni Lenape (Native American people): *see in index* Delaware

Lennon, John (British musician)
the Beatles *volume 2 page 42*

Lenoir, Étienne (French inventor)
automobile history *volume 1 page 237*
internal-combustion engine *volume 6 page 141*

lens (eye)
part of eye *volume 4 page 176, picture, volume 4 page 175*

lens (optical device)
MAIN ARTICLE *volume 7 page 130, picture, volume 7 page 130, picture, volume 7 page 131*
MORE TO EXPLORE
binoculars *volume 2 page 72*
camera *volume 3 page 20, picture, volume 3 page 20*
optics *volume 9 page 143*
telescope *volume 13 page 38, picture, volume 13 page 38*

Lent (Christianity)
Mardi Gras *volume 8 page 54*

Leo (constellation)
constellation *volume 3 page 188*
zodiac signs *picture, volume 15 page 107*

Leo III (pope)
Holy Roman Empire *volume 6 page 74*

Leo X (pope)
Medici family *volume 8 page 92*

León, Juan Ponce de (Spanish explorer): *see in index* Ponce de León, Juan

Leonardo da Vinci (Italian artist, engineer and scientist)
MAIN ARTICLE *volume 7 page 131, picture, volume 7 page 131*
MORE TO EXPLORE
flying machine plan *picture, volume 7 page 133*
helicopter *volume 6 page 36*
painting *volume 10 page 9*
Renaissance *volume 11 page 46*
“The Last Supper” *picture, volume 7 page 132*

leopard (mammal)
MAIN ARTICLE *volume 7 page 133, picture, volume 7 page 133*
MORE TO EXPLORE
jaguar *volume 7 page 8*

Leopold II (king of Belgium)
Democratic Republic of the Congo
volume 3 page 180

Leopoldville (capital city of the Democratic Republic of the Congo): *see in index* Kinshasa

lepton (subatomic particle)
atoms *volume 1 page 224*

Les Andelys (town in France) *picture, volume 6 page 167*

Lesotho (country in Africa)
MAIN ARTICLE *volume 7 page 134*
MORE TO EXPLORE
traditional houses *picture, volume 7 page 134*

Lesothosaurus (dinosaur)
dinosaurs in scale *picture, volume 4 page 53*

Lesser Antarctica (region in Antarctica): *see in index* West Antarctica

lesser anteater (mammal)
anteater *volume 1 page 138*

Lesser Antilles (island group of the West Indies)
Carib *volume 3 page 40*
West Indies *volume 15 page 32*

lesser ape (primate)
apes *volume 1 page 146*
gibbon *volume 5 page 113*

lesser curlew (bird): *see in index* whimbrel

lesser flamingo (bird)
flamingo *volume 5 page 31*

lesser panda (mammal) *picture, volume 10 page 26*
panda *volume 10 page 25, picture, volume 10 page 25*

lesser roadrunner (bird)
roadrunner *volume 11 page 71*

Leto (Greek mythology)
Apollo *volume 1 page 150*
Artemis *volume 1 page 190*

letter (alphabet)
girl practices writing *picture, volume 15 page 78*

letter carrier *picture, volume 10 page 136*
postal service *volume 10 page 136*

lettuce (plant and food)
MAIN ARTICLE *volume 7 page 135, picture, volume 7 page 135*

leukocyte (biology): *see in index* white blood cell

levee (civil engineering)
MAIN ARTICLE *volume 7 page 135, picture, volume 7 page 135*
MORE TO EXPLORE
Huang He *volume 6 page 89*

lever (mechanics)
machine *volume 8 page 6, picture, volume 8 page 6*

Levkosia (capital city of Cyprus): *see in index* Nicosia

Lewis, C. S. (British author)
MAIN ARTICLE *volume 7 page 136, picture, volume 7 page 136*

Lewis, Meriwether (U.S. explorer)
Lewis and Clark Expedition *volume 7 page 137*
diary *picture, volume 7 page 137*
Missouri River *volume 8 page 149*
Oregon Trail *volume 9 page 149*

Lewis and Clark Expedition (U.S. history)
MAIN ARTICLE *volume 7 page 137*

MORE TO EXPLORE

- Blackfoot *volume 2 page 85*
 diary *picture, volume 7 page 137*
 exploration *volume 4 page 174*
 Idaho *volume 6 page 112*
 Jefferson *volume 7 page 18*
 Rocky Mountains *volume 11 page 79*
 Sacagawea *volume 12 page 4, picture, volume 12 page 4*
- Lexington** (city in Kentucky)
 Frankfort *volume 5 page 63*
 horses graze in pasture *picture, volume 7 page 57*
 Kentucky *volume 7 page 56*
- Lexington** (city in Massachusetts, U.S.)
 Minuteman statue *picture, volume 8 page 138*
- Lexington and Concord, Battles of**
 (American Revolution, 1775) *picture, volume 1 page 98*
 American Revolution *volume 1 page 100*
- Lhasa** (capital city of Tibet, China)
 Tibet *volume 13 page 62*
- Lhasa apso** (breed of dog)
 non-sporting dogs *table, volume 4 page 62*
- Liberation Tigers of Tamil Eelam** (revolutionary organization, Sri Lanka)
 terrorism *volume 13 page 48*
- Liberator, the** (Latin American leader):
see in index Bolívar, Simón
- Liberia** (country in Africa)
 MAIN ARTICLE *volume 7 page 139*
 MORE TO EXPLORE
 images
 government buildings *picture, volume 8 page 172*
 Johnson-Sirleaf *picture, volume 7 page 139*
- Liberty, Sons of** (U.S. history)
 Revere *volume 11 page 57*
- Liberty, Statue of** (monument in New York City, New York, U.S.)
 MAIN ARTICLE *volume 7 page 140, picture, volume 7 page 140, picture, volume 9 page 60*
- Liberty Bell** (U.S. history)
 MAIN ARTICLE *volume 7 page 140, picture, volume 7 page 141*

- Liberty Bell Center** (building) *picture, volume 7 page 141*
- Liberty Enlightening the World** (monument in New York City, New York, U.S.): *see in index* Liberty, Statue of
- Liberty Island** (island in New York, U.S.)
 Statue of Liberty *volume 7 page 140, picture, volume 7 page 140, picture, volume 9 page 60*
- Libra** (astronomy)
 constellation *volume 3 page 188*
 zodiac signs *picture, volume 15 page 107*
- library**
 MAIN ARTICLE *volume 7 page 141, picture, volume 7 page 141, picture, volume 7 page 142*
- library catalog** (library science)
 library *volume 7 page 143*
- Library of Alexandria** (ancient library in Alexandria, Egypt): *see in index* Alexandria, Library of
- Library of Congress** (library in Washington., D.C., U.S.): *see in index* Congress, Library of
- Libreville** (capital city of Gabon)
 MAIN ARTICLE *volume 7 page 143*
 MORE TO EXPLORE
 Gabon *volume 5 page 78*
- Libya** (country in North Africa)
 MAIN ARTICLE *volume 7 page 144, picture, volume 7 page 144, picture, volume 7 page 145*
 MORE TO EXPLORE
 People's Palace *picture, volume 13 page 98*
- Libyan** (ancient people)
 Tunis *volume 13 page 108*
- lice** (insect): *see in index* louse
- lichen** (organism)
 MAIN ARTICLE *volume 7 page 146*
 MORE TO EXPLORE
 old-man's beard *picture, volume 7 page 146*
 orange lichen *picture, volume 7 page 146*
- Lichtenstein, Roy** (U.S. artist)
 painting *volume 10 page 12*
- Liechtenstein** (country in Europe)
 MAIN ARTICLE *volume 7 page 147, picture, volume 7 page 147*

MORE TO EXPLORE

- Vaduz Castle *picture, volume 14 page 51*
- life** (biology)
 Earth *volume 4 page 89*
- life cycle** (biology)
 amphibians *volume 1 page 111*
 animal migration *volume 8 page 125*
 coral *volume 3 page 197*
 eel *volume 4 page 108*
 insects *volume 6 page 139*
 butterfly and moth *volume 2 page 158*
 flea *volume 5 page 33*
 mammals
 antelope *volume 1 page 139*
 cheetah *volume 3 page 85*
 dog *volume 4 page 63*
 elephant *volume 4 page 124*
 horse *volume 6 page 86*
 lion *volume 7 page 158*
 tiger *volume 13 page 66*
 whale *volume 15 page 38*
 reptiles *volume 11 page 52*
 snake *volume 12 page 114*
 spider *volume 12 page 165*
- life sciences**
 science *volume 12 page 49*
- life span**
 raccoon *volume 11 page 15*
- lifestyle**
 aging *volume 1 page 47*
- lift** (physics)
 airplane *volume 1 page 56*
 glider *volume 5 page 120*
- lift** (vertical transport): *see in index* elevator
- ligament** (anatomy)
 knee *volume 7 page 74*
 knee joint in cross section *picture, volume 12 page 97*
 skeletal system *volume 12 page 97*
- light** (physics)
 MAIN ARTICLE *volume 7 page 148*
 MORE TO EXPLORE
 color *volume 3 page 155, picture, volume 3 page 155*
 energy *volume 4 page 137*
 greenhouse effect *picture, volume 5 page 157*
 radiation *volume 11 page 17*
 types of electromagnetic radiation *picture, volume 11 page 18*

- Newton *volume 9 page 56*
 optics *volume 9 page 143*
 camera *volume 3 page 20*, *picture, volume 3 page 20*
 eye *volume 4 page 175*
 fiber optics *volume 5 page 15*
 prism *volume 10 page 153*, *picture, volume 10 page 153*
 telescope *picture, volume 13 page 38*
 painting *volume 10 page 10*, *picture, volume 10 page 10*
 phenomena
 aurora *volume 1 page 227*
 mirage *volume 8 page 138*
 mirror *volume 8 page 139*
 reflection of light occurrences *picture, volume 7 page 149*
 tunicates *picture, volume 7 page 148*
- light amplification by stimulated emission of radiation** (device for generating a beam of light): *see in index* laser
- lightbulb** (device)
 Edison *volume 4 page 105*
 Edison with lightbulb *picture, volume 13 page 27*
 technology and invention *volume 13 page 27*
- lighter-than-air aircraft**: *see in index* airship; balloon
- light horse** (mammal)
 horse *volume 6 page 86*
- lighthouse**
 MAIN ARTICLE *volume 7 page 149*, *picture, volume 7 page 149*
 MORE TO EXPLORE
 Cape Enrage Lighthouse *picture, volume 9 page 42*
 Michigan *picture, volume 8 page 116*
- Lighthouse of Alexandria** (ancient lighthouse in Alexandria, Egypt)
 Alexandria *volume 1 page 75*
 ancient Egypt *volume 4 page 115*
- lighting director** (theater)
 theater *volume 13 page 58*
- light microscope** (scientific instrument): *see in index* optical microscope
- lightning** (weather) *picture, volume 4 page 120*
 electricity *volume 4 page 120*
 storm *volume 12 page 191*
- lightning bug** (insect): *see in index* firefly
- lightning rod**
 Franklin *volume 5 page 63*
- Lights, Festival of** (Hinduism): *see in index* Diwali
- Lights, Festival of** (Judaism): *see in index* Hanukkah
- lightship** (warning beacon)
 lighthouse *volume 7 page 150*
- light telescope** (optical instrument)
 telescope *volume 13 page 38*
- light-year** (astronomy)
 galaxy *volume 5 page 81*
 Milky Way *volume 8 page 129*
- lignite** (coal)
 coal *volume 3 page 144*
- Liliuokalani** (queen of Hawaii)
 Hawaii *volume 6 page 27*
- Lilongwe** (capital city of Malawi)
 MAIN ARTICLE *volume 7 page 150*
 MORE TO EXPLORE
 Malawi *volume 8 page 26*
- lily** (plant and flower)
 MAIN ARTICLE *volume 7 page 151*, *picture, volume 7 page 151*
- lily family** (plants)
 lily *volume 7 page 151*
- lily of the valley** (plant)
 lily *volume 7 page 151*
- lily pad** (plant part)
 water lily *volume 15 page 24*
- Lima** (capital city of Peru)
 MAIN ARTICLE *volume 7 page 151*, *picture, volume 7 page 152*
 MORE TO EXPLORE
 Peru *volume 10 page 64*
 Pizarro *volume 10 page 91*
- lime** (tree and fruit)
 MAIN ARTICLE *volume 7 page 152*, *picture, volume 7 page 152*
 MORE TO EXPLORE
 citrus fruits *volume 3 page 123*
- limestone** (rock)
 MAIN ARTICLE *volume 7 page 153*
 MORE TO EXPLORE
 cave *volume 3 page 62*
 cement *volume 3 page 68*
 images
 cliffs *picture, volume 7 page 153*
 paving blocks *picture, volume 11 page 76*
 quarrying *picture, volume 7 page 153*, *picture, volume 11 page 7*
 rock *volume 11 page 76*
- limited monarchy** (form of government): *see in index* constitutional monarchy
- limning** (art): *see in index* miniature painting
- Lin, Maya** (U.S. architect and artist) *picture, volume 1 page 208*
- Lincoln** (state capital of Nebraska, U.S.)
 MAIN ARTICLE *volume 7 page 154*
 MORE TO EXPLORE
 Nebraska *volume 9 page 28*
 Nebraska State Capitol building *picture, volume 7 page 154*
- Lincoln, Abraham** (president of the U.S.)
 MAIN ARTICLE *volume 7 page 154*, *picture, volume 7 page 155*
 MORE TO EXPLORE
 abolitionist movement *volume 1 page 12*
 African Americans *volume 1 page 43*
 American Civil War *volume 1 page 95*
 Buchanan *volume 2 page 140*
 Confederacy *volume 3 page 176*
 Douglass *volume 4 page 68*
 Emancipation Proclamation *volume 4 page 130*, *picture, volume 4 page 130*
 Johnson *volume 7 page 27*
 Lincoln-Douglas debates *volume 7 page 156*, *picture, volume 7 page 156*
 Reconstruction *volume 11 page 33*
 Springfield *volume 12 page 168*, *picture, volume 12 page 169*
 timeline *volume 7 page 154*
- Lincoln-Douglas debates** (U.S. history)
 MAIN ARTICLE *volume 7 page 156*, *picture, volume 7 page 156*
- Lincoln Home National Historic Site** (historic site in Springfield, Illinois, U.S.) *picture, volume 6 page 118*
- Lincoln Memorial** (monument in Washington, D.C., U.S.)
 nighttime view of Washington, D.C., *picture, volume 14 page 24*
- Lindbergh, Anne Spencer Morrow** (U.S. writer and aviator)
 Lindbergh, Charles *volume 7 page 157*

Lindbergh, Charles (U.S. aviator)

MAIN ARTICLE *volume 7 page 157, picture, volume 7 page 157*

MORE TO EXPLORE

airplane *volume 1 page 57*

Lindsay, Vachel (U.S. poet)

Hughes *volume 6 page 91*

line (mathematics)

geometry *volume 5 page 98*

line graph (diagram)

graph *volume 5 page 140*

Linnaeus, Carolus (Swedish botanist)

botany *volume 2 page 115*

Linum usitatissimum (plant and fiber):

see in index flax

lion (mammal)

MAIN ARTICLE *volume 7 page 158, picture, volume 7 page 158*

MORE TO EXPLORE

Chobe National Park *picture, volume 2 page 116*

“Lion, the Witch, and the Wardrobe, The” (book by Lewis)

Lewis *volume 7 page 137*

Lion City (capital city of Singapore): *see in index* Singapore

lionhead goldfish

goldfish *volume 5 page 123*

lipstick (cosmetic)

cosmetics *volume 3 page 202*

liquid (state of matter)

evaporation and condensation *volume 4 page 166*

glass *volume 5 page 118*

matter *volume 8 page 78, picture, volume 8 page 78*

rain *volume 11 page 21*

liquid crystal (physics)

television *volume 13 page 41*

liquid crystal display (electronics): *see in index* LCD

liquid state (state of matter): *see in index* liquid

“Li'l Folks” (comic strip by Schulz): *see in index* “Peanuts”

Lisbon (capital city of Portugal)

MAIN ARTICLE *volume 7 page 159, picture, volume 7 page 159*

MORE TO EXPLORE

Portugal *volume 10 page 133*

lisp (speech disorder)

speech *volume 12 page 162*

Liston, Sonny (U.S. boxer)

physical measurements *table, volume 12 page 183*

liter (unit of measure)

common abbreviations *table, volume 1 page 8*

measurement *volume 8 page 90*

literature

MAIN ARTICLE *volume 7 page 160*

To learn about some famous writers, look for these articles:

Alcott, Louisa

May

Alexander,

Lloyd

Andersen, Hans

Christian

Basho

Blume, Judy

Bradstreet, Anne

Brooks,

Gwendolyn

Carroll, Lewis

Cleary, Beverly

Dahl, Roald

Dickens,

Charles

Grimm Brothers

Hansberry,

Lorraine

Hinton, S.E.

Homer

Hughes,

Langston

Konigsburg,

E.L.

L'Engle,

Madeleine

Lewis, C.S.

Rowling, J.K.

Sendak, Maurice

Seuss, Dr.

Shakespeare,

William

Silverstein, Shel

Stowe, Harriet

Beecher

Tolkien, J.R.R.

Twain, Mark

Wheatley,

Phillis

Wilder, Laura

Ingalls

literature for children

MAIN ARTICLE *volume 7 page 162, picture, volume 7 page 162, picture, volume 7 page 163*

litho-offset: *see in index* offset printing

lithosphere (geology)

environment *volume 4 page 144*

Lithuania (country in Europe)

MAIN ARTICLE *volume 7 page 165*

MORE TO EXPLORE

Trakai Castle *picture, volume 7 page 165*

Vilnius *picture, volume 14 page 91*

litmus paper (chemical indicator)

acid and base *volume 1 page 17, picture, volume 1 page 17*

litre (unit of measure): *see in index* liter

litter (trash)

beach cleanup *picture, volume 4 page 143*

Little, Malcolm (U.S. Muslim leader): *see in index* Malcolm X

Little Alfold (region in Hungary)

Hungary *volume 6 page 100*

Little Bighorn, Battle of the (U.S. history)

Custer *volume 3 page 233*

national monument *picture, volume 8 page 174*

Sitting Bull *volume 12 page 92*

Little Corporal, The (emperor of France): *see in index* Napoleon I

“Little House on the Prairie” (book by Wilder)

Wilder *volume 15 page 44*

Little Mermaid (statue in Copenhagen, Denmark) *picture, volume 3 page 196*

Copenhagen *volume 3 page 195*

“Little Mermaid, The” (story by Andersen) *picture, volume 1 page 128*

Little Rock (state capital of Arkansas, U.S.)

MAIN ARTICLE *volume 7 page 166, picture, volume 7 page 166*

MORE TO EXPLORE

Arkansas *volume 1 page 180, picture, volume 1 page 181*

little skate (fish)

ray *volume 11 page 30*

little wolf (mammal): *see in index* coyote

“Little Women” (novel by Alcott)

Alcott *volume 1 page 71*

liver (anatomy)

MAIN ARTICLE *volume 7 page 166*

MORE TO EXPLORE

cardiovascular system *volume 3 page 39*

cholesterol *volume 3 page 111*

digestive system *volume 4 page 48*

frog *picture, volume 4 page 48*

human *picture, volume 4 page 47, picture, volume 7 page 167*

hepatitis *volume 6 page 42*

livestock farming

agriculture *volume 1 page 48*

Livingstone, David (Scottish explorer and missionary)

exploration *volume 4 page 174*

living thing

MAIN ARTICLE *volume 7 page 167*

MORE TO EXPLORE

division by kingdom *picture, volume 7 page 168*

division by quantity *picture, volume 7 page 167*

sand *volume 12 page 26*

lizard (reptile)

MAIN ARTICLE *volume 7 page 169*

MORE TO EXPLORE

flying lizard *picture, volume 11 page 52*

frilled lizard *picture, volume 7 page 170*

Gila monster *picture, volume 7 page 170*

Komodo dragon *picture, volume 7 page 169*

reptile *volume 11 page 51*

lizard-hipped dinosaur (dinosaur order): *see in index* Saurischia**Ljubljana** (capital city of Slovenia)

MAIN ARTICLE *volume 7 page 171, picture, volume 7 page 171*

MORE TO EXPLORE

Slovenia *volume 12 page 110*

Ljubljanica River (river in Slovenia)

Ljubljana *picture, volume 7 page 171*

llama (mammal)

MAIN ARTICLE *volume 7 page 172, picture, volume 2 page 103, picture, volume 7 page 172*

MORE TO EXPLORE

Inca *volume 6 page 121*

Peruvian farmer with a llama *picture, volume 12 page 143*

LL Cool J (U.S. rapper and actor)

hip-hop *volume 6 page 59*

rap music *volume 11 page 27*

loan (finance)

banking *volume 2 page 24, picture, volume 2 page 25*

loanword (language): *see in index* borrowing**Lobamba** (legislative and royal capital city of Swaziland)

Mbabane *volume 8 page 85*

Swaziland *volume 12 page 211*

Lobl, Elaine (U.S. author): *see in index* Konigsburg, E. L.**lobster** (marine animal)

American lobster *picture, volume 3 page 224*

Local Group (galaxy cluster)

galaxy *volume 5 page 81*

Loch Neathach (lake in Northern Ireland, United Kingdom): *see in index* Neagh, Lough**lock** (canals) *picture, volume 3 page 28*

canal *volume 3 page 27*

Erie Canal *volume 4 page 150*

Panama Canal *volume 10 page 23*

Saint Lawrence River and Seaway *volume 12 page 13*

Sault Sainte Marie canals *volume 12 page 47*

Locke, John (British philosopher)

constitution *volume 3 page 189*

human rights *volume 6 page 97*

Lockerbie (town in Scotland, United Kingdom)

Pan Am Flight 103 *volume 7 page 145*

locomotion (behavior)

amoeba *volume 1 page 108*

cheetah *volume 3 page 84*

locomotive (vehicle and train power unit)

railroad *volume 11 page 20*

steam locomotive *picture, volume 11 page 21*

technology and invention *volume 13 page 27, picture, volume 13 page 27*

locust (insect)

MAIN ARTICLE *volume 7 page 172, picture, volume 7 page 173*

MORE TO EXPLORE

grasshopper *volume 5 page 142*

lodestone (mineral)

magnet and magnetism *volume 8 page 18*

lodge (dwelling)

Mandan *picture, volume 8 page 40*

Yakama *volume 15 page 84*

Loess Plateau (plateau in China)

Huang He *volume 6 page 89*

Logan, Mount (mountain in Yukon, Canada)

Yukon *volume 15 page 97*

Loire Basin (region in France): *see in index* Loire Valley**Loire River** (river in France)

MAIN ARTICLE *volume 7 page 173, picture, volume 7 page 173*

Loire Valley (region in France)

Loire River *volume 7 page 173*

Lombard (people)

Charlemagne *volume 3 page 82*

Lomé (capital city of Togo)

MAIN ARTICLE *volume 7 page 174, picture, volume 7 page 174*

MORE TO EXPLORE

Togo *volume 13 page 74*

Lompoc (city in California, U.S.)

California missions *table, volume 8 page 140*

London (capital city of England and the United Kingdom)

MAIN ARTICLE *volume 7 page 175*

MORE TO EXPLORE

England *volume 4 page 139*

images

Big Ben *picture, volume 7 page 175*

Buckingham Palace *picture, volume 14 page 18*

Globe Theater *picture, volume 13 page 58*

high-speed train *picture, volume 11 page 20*

London Eye *picture, volume 7 page 176*

terrorist attack investigation *picture, volume 10 page 112*

World War II *picture, volume 15 page 66*

Thames River *volume 13 page 56*

United Kingdom *volume 14 page 16*

London, Tower of (building in London, United Kingdom)

London *volume 7 page 175*

London Company (English company): *see in index* Virginia Company of London**London Eye** (Ferris wheel) *picture, volume 7 page 176*

London Stock Exchange (British company)
stock exchange *volume 12 page 186*

Lone Star State (state in the U.S.): *see in index* Texas

longbow (weapon)
archery *volume 1 page 166*
various bows *picture, volume 1 page 166*

long-distance race (footrace)
track and field *volume 13 page 86*

longevity: *see in index* life span

longhorn (breed of cattle) *picture, volume 6 page 85*

longhorn beetle (insect)
types of beetles *picture, volume 2 page 49*

longhouse (dwelling)
Cayuga *volume 3 page 64*
Delaware *volume 4 page 29*
Flathead *volume 5 page 32*
Iroquois *volume 6 page 160*
Mohawk *volume 8 page 151*
Mohican *volume 8 page 153*
Oneida *volume 9 page 137*
Onondaga *volume 9 page 138*
Quapaw *volume 11 page 6*
Seneca *volume 12 page 65*
Tuscarora *volume 13 page 117*
Wappinger *volume 15 page 8*
Wyandot *volume 15 page 78*

Long Island (island in New York, U.S.)
island *volume 6 page 167*

longitude (geography)
MAIN ARTICLE *volume 7 page 113*
MORE TO EXPLORE
map and globe *volume 8 page 50*

long jump (athletics)
track and field *volume 13 page 86, picture, volume 13 page 85*

Long March (Chinese history)
Mao *volume 8 page 48*

long-nosed echidna (mammal)
echidna *volume 4 page 97*

longnose hawfish (fish)
evolution *picture, volume 4 page 171*

longship
Viking *volume 14 page 89*

long-tailed weasel (mammal)
weasel family *volume 15 page 27*

long-term memory (mental function)
memory *volume 8 page 98*

loofah (sponge)
gourd *volume 5 page 131*

loon (bird)
MAIN ARTICLE *volume 7 page 176*

MORE TO EXPLORE
common loon *picture, volume 7 page 176*

lord (British title)
knight *volume 7 page 74*
Middle Ages *volume 8 page 122*

Lord Chamberlain's Men (English theater company)
Shakespeare *volume 12 page 75*

lord chancellor (British government official)
Parliament *volume 10 page 37*

“Lord of the Rings, The” (work by Tolkien)
Tolkien *volume 13 page 77*

Lord's Supper (Christianity): *see in index* Communion

Lords, House of (British government)
Parliament *volume 10 page 37*

Lorenzo the Magnificent (Italian statesman): *see in index* Medici, Lorenzo de'

lorikeet (bird) *picture, volume 10 page 39*

loris (primate)
MAIN ARTICLE *volume 7 page 177, picture, volume 7 page 177*

Los Alamos National Laboratory (laboratory, Los Alamos, New Mexico, U.S.)
New Mexico *volume 9 page 51*

Los Angeles (city in California, U.S.)
MAIN ARTICLE *volume 7 page 178*
MORE TO EXPLORE
airship flies over Dodger Stadium *picture, volume 1 page 58*
United States *volume 14 page 27*
Walt Disney Concert Hall *picture, volume 7 page 178*

Los Angeles Dodgers (U.S. baseball team): *see in index* Dodgers

Los Angeles Kings (U.S. hockey team)
Gretzky *volume 5 page 161*

Los Angeles Lakers (U.S. basketball team)
Johnson *volume 7 page 30, picture, volume 7 page 30*

Los Angeles Music Center (building complex in Los Angeles, California, U.S.)
Los Angeles *volume 7 page 178*

Lots, Feast of (Jewish holiday): *see in index* Purim

lotus position (Yoga)
Yoga *volume 15 page 93*

Lough Neagh (lake in Northern Ireland, United Kingdom): *see in index* Neagh, Lough

Louis, Saint (king of France): *see in index* Louis IX

Louis I (Holy Roman emperor)
crowning *picture, volume 6 page 74*

Louis IX (king of France)
Crusades *volume 3 page 224*

Louis XIV (king of France)
ballet *volume 2 page 14*
France *volume 5 page 60*
Huguenots *volume 6 page 92*
La Salle *volume 7 page 110*
Versailles *volume 14 page 71*

Louis XVI (king of France)
MAIN ARTICLE *volume 7 page 179, picture, volume 7 page 179*

MORE TO EXPLORE
French Revolution *volume 5 page 69*
Marie Antoinette *volume 8 page 55*

Louis, Spyridon (Greek athlete)
Olympic Games *volume 9 page 134*

Louis Armstrong's All-Stars (U.S. music group)
Armstrong *volume 1 page 188*

Louisbourg (state capital of Pennsylvania, U.S.): *see in index* Harrisburg

Louise, Lake (lake in Canada)
mountain reflected in lake *picture, volume 1 page 69*

Louisiana (state in the U.S.)
MAIN ARTICLE *volume 7 page 180*
MORE TO EXPLORE
La Salle *volume 7 page 110*
old plantation home *picture, volume 7 page 181*

Louisiana Purchase (U.S. history)MAIN ARTICLE *volume 7 page 182*

MORE TO EXPLORE

people

Jefferson *volume 7 page 18*Madison *volume 8 page 12*Monroe *volume 8 page 171*

places

Colorado *volume 3 page 158*Louisiana *volume 7 page 181*Minnesota *volume 8 page 136*Mississippi River *volume 8 page 145*Missouri *volume 8 page 147*Montana *volume 8 page 174*Nebraska *volume 9 page 29*North Dakota *volume 9 page 88*Oklahoma *volume 9 page 130*South Dakota *volume 12 page 150*United States *volume 14 page 29*Wyoming *volume 15 page 80***Louisville** (city in Kentucky) *picture, volume 7 page 56*Frankfort *volume 5 page 63*Kentucky *volume 7 page 56***Lourenço Marques** (capital city of Mozambique): *see in index* Maputo**louse** (insect)insect *volume 6 page 139*parasite *volume 10 page 33*typhus *volume 13 page 124***Louvre** (museum in Paris, France)Louvre Pyramid *picture, volume 5 page 60*museum *volume 8 page 212*Paris *volume 10 page 34***Louvre Pyramid** (exhibit in Louvre Museum, Paris, France) *picture, volume 5 page 60***love** (tennis scoring)tennis *volume 13 page 46***“Love Me Tender”** (movie)Presley *volume 10 page 147***low** (weather): *see in index* cyclone**Low, Juliette Gordon** (U.S. youth leader)scouting *volume 12 page 54***Low Countries** (region in Europe)Netherlands *volume 9 page 39*World War II *volume 15 page 66***low-density lipoprotein** (biochemistry)
cholesterol *volume 3 page 111***Lower Canada** (historical region in Canada): *see in index* Canada East**lower course** (river)river *volume 11 page 68***Lower Cretaceous Series** (geochronology): *see in index* Early Cretaceous Epoch**Lower Egypt** (region of the Nile Valley in Africa)ancient Egypt *volume 4 page 113***Lower Peninsula** (peninsula in Michigan, U.S.)
Michigan *volume 8 page 116***low tide** (oceanic movement)tides *volume 13 page 63, picture, volume 13 page 64***Loyalist** (Spanish history): *see in index* Republican**loyalist** (U.S. and Canadian history)New Brunswick *volume 9 page 43*Nova Scotia *volume 9 page 102*Ontario *volume 9 page 140***Luanda** (capital city of Angola)MAIN ARTICLE *volume 7 page 183*

MORE TO EXPLORE

Angola *volume 1 page 122*woman carrying fruit *picture, volume 7 page 183***Lublin-Majdanek** (concentration camp in Poland): *see in index* Majdanek**Lucky Lindy** (U.S. aviator): *see in index* Lindbergh, Charles**Lucy** (fossil hominid)Ethiopia *volume 4 page 156*human origins *volume 6 page 95***luffa** (sponge): *see in index* loofah**Lukuga River** (river in Africa)Lake Tanganyika *volume 13 page 14***Lumière, Auguste** (French inventor)
movie *volume 8 page 199***Lumière, Louis** (French inventor)
movie *volume 8 page 199***Luna** (Soviet Union space probe)
Moon *volume 8 page 180***lunar calendar**calendar *volume 3 page 10***lunar eclipse** (astronomy)comparison to solar eclipse *picture, volume 4 page 98*eclipse *volume 4 page 98***lunar exploration:** *see in index* Moon exploration**Lunar Roving Vehicle** (Apollo program)
Moon exploration *picture, volume 4 page 175***lung** (anatomy)MAIN ARTICLE *volume 7 page 183, picture, volume 7 page 184*

MORE TO EXPLORE

cardiovascular system *volume 3 page 39, picture, volume 3 page 39*respiratory system *volume 11 page 55, picture, volume 11 page 56*alveoli and capillaries *picture, volume 11 page 55*tuberculosis *volume 13 page 104*X ray of infected lung *picture, volume 10 page 103***lungs** (anatomy): *see in index* lung**Lusaka** (capital city of Zambia)MAIN ARTICLE *volume 7 page 185***“Lusitania”** (ship)MAIN ARTICLE *volume 7 page 185, picture, volume 7 page 185*

MORE TO EXPLORE

World War I *volume 15 page 63***lute family** (musical instruments)musical instruments *volume 8 page 215***Lutetia** (ancient city in France): *see in index* Paris**Luther, Martin** (German religious leader)MAIN ARTICLE *volume 7 page 186, picture, volume 7 page 186*

MORE TO EXPLORE

Calvin *volume 3 page 16*Christianity *volume 3 page 114*Germany *volume 5 page 106*Reformation *volume 11 page 38, picture, volume 11 page 39***Lutheranism** (Protestant Christianity)Luther *volume 7 page 186*Protestantism *volume 10 page 158*

Luvigana (capital city of Slovenia): *see in index* Ljubljana

Luxembourg (country in northwestern Europe)

MAIN ARTICLE *volume 7 page 187*

MORE TO EXPLORE

Vianden Castle *picture, volume 7 page 187*

Luxembourg (capital city of Luxembourg)

MAIN ARTICLE *volume 7 page 188*

MORE TO EXPLORE

Luxembourg *volume 7 page 187*

Luxor, Temple of (ancient temple in Luxor, Egypt)

statue of Ramses II *picture, volume 10 page 69*

Luzon (island, Philippines)

Mount Mayon *picture, volume 10 page 72*

Philippines *volume 10 page 71*

Lydia (ancient region in Anatolia)

money *volume 8 page 161*

Lyme disease

MAIN ARTICLE *volume 7 page 188, picture, volume 7 page 188*

lymph (physiology)

circulatory system *volume 3 page 119*

lymphatic system *volume 7 page 189*

lymphatic vessel *picture, volume 7 page 190*

lymphatic system (anatomy and physiology)

MAIN ARTICLE *volume 7 page 189, picture, volume 7 page 189*

MORE TO EXPLORE

circulatory system *volume 3 page 119*

lymphatic vessel (anatomy)

lymphatic system *volume 7 page 189, picture, volume 7 page 189*

physiology *picture, volume 7 page 190*

lymph node (anatomy)

lymphatic system *volume 7 page 190, picture, volume 7 page 189*

lymphocyte (white blood cell)

immune system *volume 6 page 119*

lymphatic system *volume 7 page 190, picture, volume 7 page 190*

lymph vessel (anatomy): *see in index* lymphatic vessel

lynching (mob violence)

Wells-Barnnett *volume 15 page 29*

Lyndon B. Johnson Space Center

(building in Houston, Texas, U.S.)

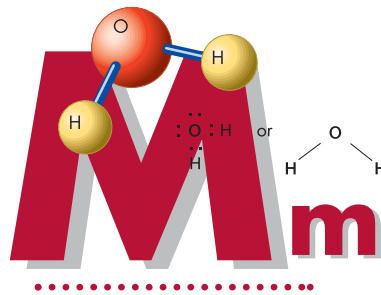
Houston *volume 6 page 89*

lynx (cat)

MAIN ARTICLE *volume 7 page 191, picture, volume 7 page 191*

lyre (musical instrument)

Orpheus and Eurydice *volume 9 page 151*



m (unit of measure): *see in index* meter

Maathai, Wangari (Kenyan educator)

Nobel peace prize *picture, volume 9 page 76*

Macaca (animal): *see in index* macaque

Macao (administrative region of China): *see in index* Macau

macaque (animal) *picture, volume 9 page 14*

MacArthur, Douglas (U.S. general)

World War II *volume 15 page 70*

Macau (administrative region of China)

MAIN ARTICLE *volume 8 page 4*

Maccabees (Jewish family)

martyr *volume 8 page 67*

Macdonald, John (Canadian prime minister)

MAIN ARTICLE *volume 8 page 4*

Macedonia (country in Europe)

MAIN ARTICLE *volume 8 page 5*

MORE TO EXPLORE

Monastery of Saint Naum *picture, volume 8 page 5*

Serbia *volume 12 page 72*

Yugoslavia *volume 15 page 95*

Macedonia (region in Greece)

Alexander the Great *volume 1 page 72*

ancient Greece *volume 5 page 156*

machine

MAIN ARTICLE *volume 8 page 6, picture, volume 8 page 7*

MORE TO EXPLORE

polyester cloth *picture, volume 13 page 28*

quarrying *volume 11 page 7*

simple machines *picture, volume 8 page 6*

sorting mail *picture, volume 10 page 136*

machine gun (weapon)

army *volume 1 page 190*

weapon *volume 15 page 26*

machine learning (artificial intelligence)

robot *volume 11 page 74*

machinery: *see in index* machine

Machu Picchu (ancient Inca city in Peru)

MAIN ARTICLE *volume 8 page 8, picture, volume 8 page 8*

Mackenzie, Alexander (Scottish explorer and fur trader)

British Columbia *volume 2 page 133*

Northwest Territories *volume 9 page 96*

Mackenzie Mountains (mountains in Canada)

Northwest Territories *volume 9 page 95*

Mackenzie River (river in Canada)

Northwest Territories *volume 9 page 95*

Macquarie Island (island in Tasmania, Australia)

Tasmania *volume 13 page 19*

macroeconomics

economics *volume 4 page 100*

macular degeneration (medical condition)

blindness *volume 2 page 90*

Macy, Anne Sullivan (U.S. teacher)

Keller *volume 7 page 53*

Keller and Sullivan *picture, volume 7 page 53*

Madagascar (island country southeast of Africa)

MAIN ARTICLE *volume 8 page 9*

MORE TO EXPLORE

animals

crocodiles *picture, volume 11 page 51*

lemur *picture, volume 7 page 128*

geography

Antananarivo *picture, volume 1 page 134*

hillside agriculture *picture, volume 8 page 10*

mad cow disease

animal disease *volume 4 page 55*

Madero, Francisco (president of Mexico)

Villa *volume 14 page 90*

Zapata *volume 15 page 102*

Madinah 'Isa (city in Bahrain)

mosque *picture, volume 2 page 9*

Madison (state capital of Wisconsin, U.S.)

MAIN ARTICLE *volume 8 page 11, picture, volume 8 page 11*

Madison, James (president of the U.S.)

MAIN ARTICLE *volume 8 page 11, picture, volume 8 page 12*

MORE TO EXPLORE

Federalist papers *volume 5 page 9*

Monroe *volume 8 page 171*

timeline *volume 8 page 11*

War of 1812 *volume 15 page 13*

madness: *see in index* mental illness

Madonna, The (mother of Jesus): *see in index* Mary

Madrid (capital city of Spain)

MAIN ARTICLE *volume 8 page 13, picture, volume 8 page 13*

Mafia (island of Tanzania)

Tanzania *volume 13 page 15*

magazine (publication)

MAIN ARTICLE *volume 8 page 14*

MORE TO EXPLORE

“Stone Soup” *picture, volume 8 page 14*

Magellan (United States spacecraft)

Venus *volume 14 page 67, picture, volume 14 page 66*

Magellan, Ferdinand (Portuguese explorer)

MAIN ARTICLE *volume 8 page 15, picture, volume 8 page 15*

MORE TO EXPLORE

Atlantic Ocean *volume 1 page 221*

exploration *volume 4 page 174*

Oceania *volume 9 page 122*

exploration and settlement of the

Americas *volume 1 page 103*

Tierra del Fuego *volume 13 page 64*

Pacific Ocean *volume 10 page 5*

Magellan, Strait of (channel in South America)

Magellan's voyages *volume 8 page 16*

magenta (color)

light *picture, volume 3 page 155*

pigment *picture, volume 3 page 156*

magic (entertainment)

MAIN ARTICLE *volume 8 page 16, picture, volume 8 page 17*

magician: *see in index* magic

Magic Johnson Foundation (U.S. organization)

Johnson *volume 7 page 30*

magic realism (literary style)

literature *volume 7 page 162*

magma (molten rock)

plate tectonics *volume 10 page 98*

rock *volume 11 page 75*

volcano *volume 14 page 99, picture, volume 14 page 102*

Magna Carta (English charter, 1215)

MAIN ARTICLE *volume 8 page 17, picture, volume 8 page 17*

MORE TO EXPLORE

bill of rights *volume 2 page 70*

civil rights *volume 3 page 128*

constitution *volume 3 page 189*

England *volume 4 page 141*

magnesite (mineral)

Austria *volume 1 page 234*

magnet (physics)

MAIN ARTICLE *volume 8 page 18, picture, volume 8 page 18, picture, volume 8 page 19*

MORE TO EXPLORE

compass *volume 3 page 171*

electricity *volume 4 page 121*

magnetic field (physics)

bar magnet and magnetic field *picture, volume 8 page 18*

magnetism *volume 8 page 19*

magnetic pole (physics) *picture, volume 8 page 19*

compass *volume 3 page 171*

magnet *volume 8 page 19*

magnetic tape

sound recording *volume 12 page 136*

magnetism (physics)

MAIN ARTICLE *volume 8 page 18, picture, volume 8 page 19*

MORE TO EXPLORE

force *volume 5 page 51*

magnification (optics)

binoculars *volume 2 page 72*

microscope *volume 8 page 120*

magnolia (tree and shrub)

MAIN ARTICLE *volume 8 page 19, picture, volume 8 page 20*

magpie (bird)

MAIN ARTICLE *volume 8 page 20, picture, volume 8 page 20*

Mahavira (Jaina teacher)

Jainism *volume 7 page 9*

Mahayana (Buddhism)

Buddhism *volume 2 page 144*

Mahé islands group (islands of Seychelles)

Seychelles *volume 12 page 74*

Mahican (Native American people): *see in index* Mohican

mahogany (tree)

MAIN ARTICLE *volume 8 page 21, picture, volume 8 page 21*

Maia (Greek mythology)

Hermes *volume 6 page 47*

Maidanek (concentration camp in Poland): *see in index* Majdanek

“Maids of Honor, The” (painting by Velázquez): *see in index* “Meninas, Las”

mail (armor)

armor *volume 1 page 187*

mail (communication)

images

letter carrier *picture, volume 10 page 136*

machines sorting mail *picture, volume 10 page 136*

postal service *volume 10 page 136*

Maine (state in the U.S.)

MAIN ARTICLE *volume 8 page 22*

MORE TO EXPLORE

geography

Augusta *picture, volume 1 page 226*

Camden harbor *picture, volume 8 page 23*

Screw Auger Falls *picture, volume 1 page 151*

history

American Civil War *volume 1 page 95*

- Missouri Compromise *volume 8 page 148*
- Maine, University of** (university in Orono, Maine, U.S.)
Maine *volume 8 page 23*
- “Maine”** (U.S. battleship)
Spanish-American War *volume 12 page 157*
- Maine System, University of** (university in Orono, Maine, U.S.): *see in index* Maine, University of
- main rotor** (helicopter part)
helicopter *volume 6 page 35*
parts of a helicopter *picture, volume 6 page 35*
- maize** (grain): *see in index* corn
- Majdanek** (concentration camp in Poland)
memorial sculpture *picture, volume 6 page 72*
- Majol** (island country in the Pacific Ocean): *see in index* Marshall Islands
- majority opinion** (law): *see in index* opinion
- Major League Baseball** (U.S. sports organization)
baseball *volume 2 page 32*
- major life zone**: *see in index* biome
- Majuro** (atoll of the Marshall Islands)
MAIN ARTICLE *volume 8 page 24*
MORE TO EXPLORE
coral reef *picture, volume 8 page 24*
Marshall Islands *volume 8 page 62*
- makeup** (cosmetic)
cosmetics *volume 3 page 202*
- mako shark** (fish)
shark *volume 12 page 77*
- Makuria** (ancient kingdom, Nubia, Africa)
Nubia *volume 9 page 103*
- Malabo** (capital city of Equatorial Guinea)
MAIN ARTICLE *volume 8 page 24, picture, volume 8 page 25*
MORE TO EXPLORE
Equatorial Guinea *volume 4 page 148*
- Malagasy** (people)
Madagascar *volume 8 page 9*
- Malagasy languages**
Madagascar *volume 8 page 9*
- Malagasy Republic** (island country southeast of Africa): *see in index* Madagascar
- malaria** (disease)
MAIN ARTICLE *volume 8 page 25*
MORE TO EXPLORE
mosquito *volume 8 page 189*
- Malawi** (country in Africa)
MAIN ARTICLE *volume 8 page 26*
MORE TO EXPLORE
Lake Nyasa *picture, volume 8 page 26*
- Malawi, Lake** (lake in Africa): *see in index* Nyasa, Lake
- Malay** (people)
Malaysia *volume 8 page 27*
Philippines *volume 10 page 71*
- Malayan sun bear** (mammal): *see in index* sun bear
- Malay Archipelago** (island group in the Indian and Pacific Oceans): *see in index* East Indies
- Malaysia** (country in Southeast Asia)
MAIN ARTICLE *volume 8 page 27*
MORE TO EXPLORE
Asia *volume 1 page 200*
images
girls wearing veils *picture, volume 8 page 28*
oil palm fruits *picture, volume 8 page 28*
Petronas Twin Towers *picture, volume 7 page 88*
workers picking tea leaves *picture, volume 13 page 24*
- Malcolm X** (U.S. Muslim leader)
MAIN ARTICLE *volume 8 page 29, picture, volume 8 page 29*
MORE TO EXPLORE
African Americans *volume 1 page 45*
civil rights movement *volume 3 page 131*
- Maldives** (island country in the Indian Ocean)
MAIN ARTICLE *volume 8 page 30, picture, volume 8 page 30*
MORE TO EXPLORE
mosque *picture, volume 8 page 31*
- Male** (capital city of Maldives)
MAIN ARTICLE *volume 8 page 31*
MORE TO EXPLORE
Maldives *volume 8 page 30*
mosque *picture, volume 8 page 31*
- male** (gender)
egg *volume 4 page 108*
- Malecite** (Native American people)
MAIN ARTICLE *volume 8 page 31*
MORE TO EXPLORE
New Brunswick *volume 9 page 43*
- Mali** (country in Africa)
MAIN ARTICLE *volume 8 page 32, picture, volume 8 page 32*
- Mali empire** (historical empire in Africa)
MAIN ARTICLE *volume 8 page 33*
MORE TO EXPLORE
Ghana Empire *volume 5 page 112*
illustrated map *map, volume 8 page 33*
Songhai empire *volume 12 page 133*
- malignant tumor** (disease): *see in index* cancer
- Malinke** (people)
Gambia *volume 5 page 84*
Guinea *volume 5 page 169*
- Mall, the** (area in Washington, D.C., U.S.)
Washington, D.C. *volume 15 page 18*
- mallard** (duck)
duck *volume 4 page 81*
- Mallon, Mary** (U.S. typhoid carrier): *see in index* Typhoid Mary
- Malory, Sir Thomas** (English writer)
Arthurian legend *volume 1 page 194*
- Malta** (island country in the Mediterranean Sea)
MAIN ARTICLE *volume 8 page 34*
MORE TO EXPLORE
Valletta *picture, volume 8 page 34, picture, volume 14 page 52*
- malted barley** (grain)
barley *volume 2 page 28*
- Maltese** (breed of dog)
toy dogs *table, volume 4 page 62*
- Malvinas Islands** (British colony in the South Atlantic Ocean): *see in index* Falkland Islands

mammal (animal class)

MAIN ARTICLE *volume 8 page 35*

MORE TO EXPLORE

American dog tick *picture, volume 13 page 63*

animal *volume 1 page 125*

brain *volume 2 page 122, picture, volume 2 page 122*

ear *volume 4 page 87*

egg *volume 4 page 108*

endangered species *volume 4 page 134*

extinct animals *volume 1 page 127*

gestation *volume 5 page 108*

heart *volume 6 page 32*

hibernation *volume 6 page 50*

images

dolphin *picture, volume 8 page 35*

Highland cattle *picture, volume 8 page 36*

human baby *picture, volume 8 page 37*

manatee *picture, volume 15 page 109*

polar bear *picture, volume 8 page 35*

leg *volume 7 page 123*

prehistoric life *volume 10 page 146*

vertebrates *volume 14 page 72*

mammoth (extinct mammal)

MAIN ARTICLE *volume 8 page 75, picture, volume 8 page 76*

Mammoth Cave (cave in Kentucky, U.S.)
cave *volume 3 page 62*

Ma'mun, al- (Muslim ruler)

Caliphate *volume 3 page 14*

man: *see in index* human being

Managua (capital city of Nicaragua)

MAIN ARTICLE *volume 8 page 38, picture, volume 8 page 38*

MORE TO EXPLORE

Nicaragua *volume 9 page 64*

Managua, Lake (lake in Nicaragua) *picture, volume 8 page 38*

Manama (capital city of Bahrain)

MAIN ARTICLE *volume 8 page 38*

MORE TO EXPLORE

Bahrain *volume 2 page 9*

Grand Mosque *picture, volume 8 page 39*

Manassas, Battle of (U.S. history, 1861):
see in index Bull Run, Battle of

manatee (mammal)

MAIN ARTICLE *volume 8 page 39, picture, volume 8 page 39*

MORE TO EXPLORE

zoologist *picture, volume 15 page 109*

Manche, La (arm of the Atlantic Ocean in Europe): *see in index* English Channel

Manchester United (British soccer team)
Beckham *volume 2 page 45*

Manchu Dynasty (Chinese history, 1644-1911): *see in index* Qing Dynasty

mandala (Hindu and Buddhist symbol)
Hinduism *volume 6 page 57*

Mandan (Native American people)

MAIN ARTICLE *volume 8 page 40, picture, volume 8 page 40*

MORE TO EXPLORE

Arikara *volume 1 page 177*

Hidatsa *volume 6 page 53*

Lewis and Clark Expedition *volume 7 page 137*

Sacagawea *volume 12 page 4*

mandarin duck (waterfowl) *picture, volume 4 page 81*

mandarin orange (fruit)
orange *volume 9 page 144*

Mandela, Nelson (president of South Africa)

MAIN ARTICLE *volume 8 page 40, picture, volume 8 page 41*

MORE TO EXPLORE

African National Congress *volume 1 page 45*

South Africa *volume 12 page 139*

Mandingo (people): *see in index* Malinke

mandrill (primate)
monkey *volume 8 page 168*

mane (anatomy)
horse *picture, volume 6 page 7*
lion *volume 7 page 158*

Manet, Édouard (French painter)
painting *volume 10 page 10*

mangabey (monkey) *picture, volume 8 page 167*

Mangas Coloradas (Apache chief)
Cochise *volume 3 page 146*

mangel-wurzel (plant)
beet *volume 2 page 46*

mango (tree and fruit)

MAIN ARTICLE *volume 8 page 41, picture, volume 8 page 41*

mangold (plant): *see in index* mangel-wurzel

mangrove (tree and shrub)
MAIN ARTICLE *volume 8 page 42, picture, volume 8 page 42*

mangrove snake (reptile) *picture, volume 12 page 114*

Manhattan (borough in New York City, New York, U.S.)
aerial view of Central Park *picture, volume 9 page 59*
New York City *volume 9 page 60*

mania (psychiatry)
mental illness *volume 8 page 100*

Manila (capital city of the Philippines)
MAIN ARTICLE *volume 8 page 43, picture, volume 8 page 43*

MORE TO EXPLORE

Philippines *volume 10 page 71*

Manitoba (province in Canada)
MAIN ARTICLE *volume 8 page 44*

MORE TO EXPLORE

aurora over northern Canada *picture, volume 1 page 227*

Canadian flax crop *picture, volume 8 page 45*

polar bear on Hudson Bay ice *picture, volume 8 page 45*

Manitou (Algonquian belief)
Algonquian *volume 1 page 81*

Manju-Patan (capital city of Nepal): *see in index* Kathmandu

mankind: *see in index* human being

Manned Spacecraft Center (building in Houston, Texas, U.S.): *see in index* Lyndon B. Johnson Space Center

mantle (Earth)
Earth *volume 4 page 89, picture, volume 4 page 89*

mantle (invertebrate anatomy)
mollusk *volume 8 page 157*

mantra (Buddhism and Hinduism)
Hinduism *volume 6 page 57*

Mantrayana (Buddhism and Hinduism):
see in index Tantrism

manufacturingMAIN ARTICLE *volume 8 page 46*

MORE TO EXPLORE

assembly line *picture, volume 8 page 46*industry *volume 6 page 134, picture, volume 6 page 134*North America *volume 9 page 82*recycling *volume 11 page 35*South Africa *volume 12 page 138*technology and invention *volume 13 page 26***manuscript** (publishing)book and bookmaking *volume 2 page 108***manuscript illumination** (art): *see in index* illuminated manuscript**Manuza** (African king): *see in index* Mavura**Maori** (people)MAIN ARTICLE *volume 8 page 47*

MORE TO EXPLORE

Maori greeting *picture, volume 8 page 47*Maori village *picture, volume 9 page 62*New Zealand *volume 9 page 61*Oceania *volume 9 page 122***Mao Zedong** (Chinese leader)MAIN ARTICLE *volume 8 page 47, picture, volume 8 page 48*

MORE TO EXPLORE

China *volume 3 page 104***map** (cartography)MAIN ARTICLE *volume 8 page 48, picture, volume 1 page 223*

MORE TO EXPLORE

geography *volume 5 page 97, picture, volume 5 page 96***map engraving** (cartography): *see in index* map**maple** (tree and shrub)MAIN ARTICLE *volume 8 page 51, picture, volume 8 page 51***maple syrup** (food)maple *volume 8 page 52*sugar maple *picture, volume 8 page 51***mapmaking** (mapmaking): *see in index* cartography**mapping** (mapmaking): *see in index* cartography**map scale** (mapmaking): *see in index* scale**map symbol** (cartography)map and globe *volume 8 page 51***Maputo** (capital city of Mozambique)MAIN ARTICLE *volume 8 page 52, picture, volume 8 page 52*

MORE TO EXPLORE

Mozambique *volume 8 page 200***marabou** (bird)stork *volume 12 page 191***Maracaibo, Lake** (lake in Venezuela)facts about South America *volume 12 page 143*Venezuela *volume 14 page 63***marathon** (footrace)MAIN ARTICLE *volume 8 page 52*

MORE TO EXPLORE

Boston Marathon *picture, volume 8 page 53*track and field *volume 13 page 86***Marathon, Battle of** (Greek history)marathon *volume 8 page 53*Persian Wars *volume 10 page 63***Maravi Confederacy** (historical empire in Africa)Malawi *volume 8 page 26***marble** (rock)limestone *volume 7 page 153***Marble Canyon** (canyon in Arizona, U.S.) *picture, volume 3 page 159***March** (month)Ares *volume 1 page 174***March on Washington** (U.S. history): *see in index* Washington, March on**March Revolution** (Russian history): *see in index* February Revolution**Marconi, Guglielmo** (Italian scientist)MAIN ARTICLE *volume 8 page 53, picture, volume 8 page 53*

MORE TO EXPLORE

radio *volume 11 page 19*telecommunication *volume 13 page 34***Marcos, Ferdinand** (ruler of the Philippines)Philippines *volume 10 page 72***Mardi Gras** (holiday)MAIN ARTICLE *volume 8 page 54, picture, volume 8 page 54***Margherita Peak** (mountain in Africa)Democratic Republic of the Congo *volume 3 page 179***Maria de' Medici** (queen of France): *see in index* Marie de Médicis**Mariana Trench** (submarine trench, Pacific Ocean)Pacific Ocean *volume 10 page 4***Marie Antoinette** (queen of France)MAIN ARTICLE *volume 8 page 55, picture, volume 8 page 55*

MORE TO EXPLORE

French Revolution *volume 5 page 69***Marie de Médicis** (queen of France)paintings by Rubens *picture, volume 8 page 91***marigold** (plant and flower)MAIN ARTICLE *volume 8 page 55, picture, volume 8 page 56***marine biology** (science)ocean *volume 9 page 118, picture, volume 9 page 118***marine eel** (fish)eel *volume 4 page 107***marine grotto** (geology): *see in index* sea cave**marine iguana** (lizard)iguana *volume 6 page 114***marine navigation**: *see in index* ship navigation**Mariner** (United States spacecraft)Mercury *volume 8 page 102*Venus *volume 14 page 67***marines** (type of soldier)MAIN ARTICLE *volume 8 page 56, picture, volume 8 page 56***marine science** (science): *see in index* oceanography**marine transportation**: *see in index* shipping**Marinus, Saint** (Christian)San Marino *volume 12 page 29***market** (economics)marketplaces in different cultures
AfricaCôte d'Ivoire *picture, volume 3 page 204*

Dar es Salaam *picture, volume 4 page 16*
 Kigali *picture, volume 7 page 64*
 Maroua *picture, volume 3 page 22*
 Mbabane *picture, volume 8 page 85*
 Togo *picture, volume 13 page 74*
 Asia and Middle East
 Bangkok *picture, volume 2 page 20*
 Cairo *picture, volume 1 page 159*
 Caribbean
 Havana *picture, volume 3 page 228*
 Marigot *picture, volume 5 page 165*
 Central and South America
 Belmopan *picture, volume 2 page 59*
 Chichicastenango *picture, volume 5 page 167*
 Ecuador *picture, volume 4 page 103*
 Guatemala *picture, volume 3 page 75*
 village market *picture, volume 4 page 100*
 North America *picture, volume 14 page 60*
 stock exchange *volume 12 page 186*
Marmara, Sea of (inland sea in Turkey)
 Mediterranean Sea *volume 8 page 94*
marmot (rodent)
 hibernation *volume 6 page 49*
Maroua (town in Cameroon)
 market scene *picture, volume 3 page 22*
Marquesas Islands (islands in French Polynesia)
 Hawaii *volume 6 page 26*
Marquette, Jacques (Jesuit explorer)
 MAIN ARTICLE *volume 8 page 57, picture, volume 8 page 57*
 MORE TO EXPLORE
 Illinois *volume 6 page 118*
 Jolliet *volume 7 page 31, picture, volume 7 page 31*
 Mississippi River *volume 8 page 145*
Marquises, Îles (islands in French Polynesia): *see in index* Marquesas Islands
Marrakech (city in Morocco)
 dyed wool at market *picture, volume 8 page 184*
marrow (bone): *see in index* bone marrow
Mars (Roman god)
 Ares *volume 1 page 174*

Mars (planet)
 MAIN ARTICLE *volume 8 page 58, picture, volume 8 page 58*
 MORE TO EXPLORE
 globe *picture, volume 8 page 49*
 planets *volume 10 page 92, picture, volume 10 page 93*
 solar system *volume 12 page 127, picture, volume 12 page 127*
 space exploration *volume 12 page 152*
 Opportunity *picture, volume 12 page 152*
 Pathfinder view of the rover *picture, volume 8 page 59*
“Marseillaise, La” (French national anthem)
 national anthem *volume 9 page 13*
Mars Express (European spacecraft)
 Mars *volume 8 page 59*
Mars Global Surveyor (United States spacecraft)
 Mars *volume 8 page 59, picture, volume 8 page 58*
marsh (wetland)
 MAIN ARTICLE *volume 8 page 60*
 MORE TO EXPLORE
 Alaska *picture, volume 8 page 60*
 drought *picture, volume 4 page 78*
 swamp *volume 12 page 209, picture, volume 12 page 209*
 wetland *volume 15 page 36, picture, volume 15 page 36*
Marshall, George (U.S. general)
 Cold War *volume 3 page 150*
Marshall, Thurgood (U.S. jurist)
 MAIN ARTICLE *volume 8 page 61, picture, volume 8 page 61*
 MORE TO EXPLORE
 African Americans *volume 1 page 45*
 desegregation decision *picture, volume 1 page 44*
Marshall Islands (island country in the Pacific Ocean)
 MAIN ARTICLE *volume 8 page 62*
 MORE TO EXPLORE
 island *volume 6 page 167*
Marshall Plan (European-U.S. history)
 Cold War *volume 3 page 150*
Mars Odyssey (United States spacecraft)
 Mars *volume 8 page 59*

Mars Pathfinder (United States spacecraft): *see in index* Pathfinder
marsupial (mammal)
 MAIN ARTICLE *volume 8 page 63, picture, volume 8 page 63*
 MORE TO EXPLORE
 Australia *volume 1 page 230*
 gestation *volume 5 page 109*
 mammal *volume 8 page 37*
marsupial mole (mammal)
 marsupial *picture, volume 8 page 63*
MARTa Museum (museum in Herford, Germany) *picture, volume 1 page 172*
martial arts
 MAIN ARTICLE *volume 8 page 64, picture, volume 8 page 64, picture, volume 8 page 65*
 MORE TO EXPLORE
 Beijing *picture, volume 2 page 50*
Martinique (French overseas department in the West Indies)
 MAIN ARTICLE *volume 8 page 65*
 MORE TO EXPLORE
 cathedral in Fort-de-France *picture, volume 8 page 66*
martyr (religion)
 MAIN ARTICLE *volume 8 page 67*
 MORE TO EXPLORE
 saint *volume 12 page 9*
Marx, Karl (German philosopher) *picture, volume 3 page 168*
 communism *volume 3 page 167*
 Lenin *volume 7 page 129*
 membership in socialist organization *picture, volume 12 page 120*
 socialism *volume 12 page 119*
Mary (mother of Jesus)
 Roman Catholicism *volume 11 page 82*
Mary (queen of Scotland): *see in index* Mary, Queen of Scots
Mary I (queen of England)
 Elizabeth I *volume 4 page 125*
 Henry VIII *volume 6 page 39*
Mary, Queen of Scots (queen of Scotland)
 MAIN ARTICLE *volume 8 page 67, picture, volume 8 page 67*
 MORE TO EXPLORE
 Elizabeth I *volume 4 page 125*

Maryland (state in the U.S.)

MAIN ARTICLE *volume 8 page 68*

MORE TO EXPLORE

geography

Annapolis historic district *picture, volume 1 page 132*

Chesapeake Bay near Annapolis *picture, volume 8 page 69*

Inner Harbor in Baltimore *picture, volume 8 page 68*

Mary Magdalene, Saint (disciple of Jesus)

Jesus Christ *volume 7 page 23*

Mary Tudor (queen of England): *see in index* Mary I

masa (dough)

corn *volume 3 page 200*

mascara (cosmetic)

cosmetics *volume 3 page 202*

Maseru (capital city of Lesotho)

MAIN ARTICLE *volume 8 page 70*

MORE TO EXPLORE

Lesotho *volume 7 page 134*

masjid (place of worship): *see in index* mosque

mask (disguise)

Angola *picture, volume 1 page 123*

Papua New Guinea *picture, volume 10 page 29*

South American *picture, volume 1 page 87*

masked chimpanzee (primate): *see in index* West African chimpanzee

mason wasp (insect): *see in index* potter wasp

mass (physics)

matter *volume 8 page 78*

Mass (Roman Catholicism)

Roman Catholicism *volume 11 page 82, picture, volume 11 page 82*

Massachuset (Native American people)

MAIN ARTICLE *volume 8 page 70*

Massachusetts (state in the U.S.)

MAIN ARTICLE *volume 8 page 71*

MORE TO EXPLORE

geography

Cape Cod *picture, volume 8 page 73*

Harvard University *picture, volume 8 page 73*

Moore State Park *picture, volume 8 page 72*

Quincy Market in Boston *picture, volume 2 page 114*

history

Adams *volume 1 page 23*

Maine *volume 8 page 23*

Massachuset *volume 8 page 70*

New Hampshire *volume 9 page 48*

Concord *volume 3 page 175*

Massachusetts Bay Colony (American colonial history)

MAIN ARTICLE *volume 8 page 74*

MORE TO EXPLORE

Massachusetts *volume 8 page 72*

Massachusetts Bay Company (American colonial history)

Massachusetts Bay Colony *volume 8 page 74*

Massasoit (Wampanoag chief)

MAIN ARTICLE *volume 8 page 75, picture, volume 8 page 75*

MORE TO EXPLORE

Metacom *volume 8 page 105*

Squanto *volume 12 page 170*

visiting with English settlers *picture, volume 1 page 105*

Wampanoag *volume 15 page 7*

mass extinction (biological event)

extinct animals *volume 1 page 126*

“Mass in B Minor” (composition by Bach)

Bach *volume 2 page 4*

mass media (communication)

advertising *volume 1 page 32*

mass production (industry)

technology and invention *volume 13 page 28*

Whitney *volume 15 page 42*

mass transit: *see in index* public transportation

mastaba (archaeology)

pyramid *volume 10 page 170*

Masters Tournament (golf)

Woods *volume 15 page 59*

mastication (physiology): *see in index* chewing

mastiff (breed of dog)

working dogs *table, volume 4 page 62*

mastodon (extinct mammal)

MAIN ARTICLE *volume 8 page 75, picture, volume 8 page 76*

match (boxing): *see in index* bout

match (tennis)

tennis *volume 13 page 46*

maté (beverage)

holly *volume 6 page 71*

Paraguay *volume 10 page 30*

material, raw (industry): *see in index* raw material

mathematics

MAIN ARTICLE *volume 8 page 76*

MORE TO EXPLORE

student studying arithmetic *picture, volume 8 page 77*

workers use applied mathematics for building *picture, volume 8 page 77*

Matiauda, Alfredo Stroessner (president of Paraguay): *see in index* Stroessner, Alfredo

mating (animal behavior): *see in index* life cycle

mating season (zoology)

antelope *volume 1 page 139*

kingfisher *volume 7 page 67*

songbird *volume 12 page 132*

Matisse, Henri (French artist)

painting *volume 10 page 11*

Matsuo Munefusa (Japanese poet): *see in index* Basho

matter (physics)

MAIN ARTICLE *volume 8 page 78, picture, volume 8 page 78*

MORE TO EXPLORE

crystal *volume 3 page 226*

evaporation and condensation *volume 4 page 166*

physics *volume 10 page 78*

Matterhorn (mountain in Europe) *picture, volume 1 page 90*

Matusadona National Park (park in Zimbabwe) *picture, volume 15 page 105*

matzo (food)

Passover *volume 10 page 40*

Mau Mau (Kenyan political movement)

Kenya *volume 7 page 59*

Mauna Loa (volcano in Hawaii, U.S.)
Hawaii *volume 6 page 26*

Maundy Thursday (Christian holy day):
see in index Holy Thursday

Mauritania (country in Africa)
MAIN ARTICLE *volume 8 page 79*

Mauritius (island country in the Indian Ocean)

MAIN ARTICLE *volume 8 page 80, picture, volume 8 page 80*

MORE TO EXPLORE
Port Louis *picture, volume 10 page 130*

Mauryan Empire (ancient state in India)
MAIN ARTICLE *volume 8 page 81, picture, volume 8 page 81*

MORE TO EXPLORE
Asia *volume 1 page 204*
India *volume 6 page 124*

Mavura (African king)
Monomotapa *volume 8 page 169*

Mawensi (volcano in Tanzania)
Mount Kilimanjaro *volume 7 page 65*

maximum-security prison
prison *volume 10 page 154*

Maya (Native American people)
MAIN ARTICLE *volume 8 page 81*
MORE TO EXPLORE
culture
calendars *volume 3 page 10*
chocolate *volume 3 page 109*
hieroglyphics *volume 6 page 53*
places
Belize *volume 2 page 57*
Xunantunich ruins *picture, volume 2 page 57*
Central America *volume 3 page 75*
Guatemala *volume 5 page 166*
Chichicastenango market *picture, volume 5 page 167*
temple *picture, volume 3 page 75*
Honduras *volume 6 page 77*
Mexico *volume 8 page 111*
Chichén Itzá ruins *picture, volume 8 page 82*
Yucatán Peninsula *volume 15 page 94*

May Day (holiday)
MAIN ARTICLE *volume 8 page 82, picture, volume 8 page 82*
MORE TO EXPLORE
Soviet Union *picture, volume 14 page 14*

“Mayflower” (ship)
MAIN ARTICLE *volume 8 page 83, picture, volume 8 page 83*

MORE TO EXPLORE
Massachusetts *volume 8 page 72*
Thanksgiving *volume 13 page 56*

Mayflower Compact (1620, North American history)
“Mayflower” *volume 8 page 84*

Mayo, Plaza de (square in Buenos Aires, Argentina)
Buenos Aires *volume 2 page 146*

Mayon, Mount (volcano in the Philippines) *picture, volume 10 page 72*

mayor (government official)
city *volume 3 page 124*

Mayor, Plaza (plaza in Madrid, Spain)
picture, volume 8 page 13

maypole
May Day *volume 8 page 83*
schoolchildren *picture, volume 8 page 82*

Mays, Willie (U.S. baseball player)
MAIN ARTICLE *volume 8 page 84, picture, volume 8 page 84*

Mazar-e Sharif (city in Afghanistan)
blue-tiled mosque *picture, volume 1 page 37*

Mazarin Bible: *see in index* Gutenberg Bible

Mazatlán (city in Mexico)
musicians *picture, volume 7 page 113*

Mazda (automobile)
hybrid car *picture, volume 1 page 237*

maze (mathematics)
Indus Valley Civilization *picture, volume 6 page 135*

Mbabane (administrative capital city of Swaziland)
MAIN ARTICLE *volume 8 page 85*
MORE TO EXPLORE
market *picture, volume 8 page 85*
Swaziland *volume 12 page 211*

Mbeki, Thabo (president of South Africa) *picture, volume 1 page 46*

McCartney, Paul (British musician)
the Beatles *volume 2 page 42*

McClure, Robert (Irish explorer)
Northwest Passage *volume 9 page 94*

McGill University (university in Montreal, Quebec, Canada)
ice hockey *volume 6 page 69*

McHenry, Fort (fort in Baltimore, Maryland, U.S.)
Key *volume 7 page 60*

McKinley, Mount (mountain in Alaska, U.S.)

MAIN ARTICLE *volume 8 page 85, picture, volume 8 page 86*

MORE TO EXPLORE
United States *volume 14 page 24*
Alaska *volume 1 page 63*

McKinley, William (president of the U.S.)

MAIN ARTICLE *volume 8 page 86, picture, volume 8 page 86*

MORE TO EXPLORE
assassination *volume 1 page 211*
Mount McKinley *volume 8 page 86*
Roosevelt *volume 11 page 94*
Spanish-American War *volume 12 page 157*
timeline *volume 8 page 86*

McLeod, Mary (U.S. educator): *see in index* Bethune, Mary McLeod

Mead, Lake (lake in the U.S.)
Nevada *volume 9 page 41*

mean (mathematics)
statistics *volume 12 page 183*

measles (disease)
MAIN ARTICLE *volume 8 page 87*
MORE TO EXPLORE
child with measles rash *picture, volume 8 page 88*

measurement
MAIN ARTICLE *volume 8 page 88*

measurement system: *see in index* metric system

measuring instrument: *see in index* measurement

meat (food)
fermentation *volume 5 page 11*

Mecca (city in Saudi Arabia)
MAIN ARTICLE *volume 8 page 90, picture, volume 8 page 91*

MORE TO EXPLORE

- Islam *volume 6 page 164*
 Muhammad *volume 8 page 203*
 pilgrimage *volume 10 page 85*
 Saudi Arabia *volume 12 page 43*
- Mecca, Great Mosque of** (mosque in Mecca, Saudi Arabia): *see in index*
 Haram Mosque, al-
- mechanical clock** (instrument)
 clock *volume 3 page 140*
- mechanical equilibrium** (physiology): *see in index* equilibrium
- mechanical radiation** (physics)
 radiation *volume 11 page 17*
- medal play** (golf): *see in index* stroke play
- media, the** (communication): *see in index* mass media
- median** (mathematics)
 statistics *volume 12 page 183*
- medical care** (medical treatment and insurance coverage): *see in index* health care
- medical sciences**: *see in index* medicine
- medical service** (medical treatment and insurance coverage): *see in index* health care
- Medici, Anna Maria Luisa de'** (Italian noblewoman)
 Medici family *volume 8 page 92*
- Medici, Cosimo de'** (ruler of Florence)
 Medici family *volume 8 page 92*
- Medici, Giovanni de'** (pope): *see in index* Leo X
- Medici, Lorenzo de'** (Italian statesman)
 Medici family *volume 8 page 92*
- Medici Chapel** (chapel in Florence, Italy)
 Michelangelo *volume 8 page 115*
- Medici family**
 MAIN ARTICLE *volume 8 page 91, picture, volume 8 page 91*
 MORE TO EXPLORE
 Renaissance *volume 11 page 46*
- medicine** (chemical agent): *see in index* drug
- medicine** (science)
 MAIN ARTICLE *volume 8 page 92*

MORE TO EXPLORE

- Blackwell *volume 2 page 89*
 images
 health worker *picture, volume 3 page 110*
 medical researchers working in a laboratory *picture, volume 12 page 49*
 operating room *picture, volume 12 page 207*
 pediatrician *picture, volume 8 page 92*
 X-ray *picture, volume 8 page 93*
 technology
 drug *volume 4 page 79*
 X-ray *volume 15 page 82*
- Médicis, Marie de** (queen of France): *see in index* Marie de Médicis
- medieval period** (European history): *see in index* Middle Ages
- Medina** (city in Saudi Arabia)
 Islam *volume 6 page 165*
 Muhammad *volume 8 page 203*
 Saudi Arabia *volume 12 page 43*
- Mediterranean** (ethnic-geographic area)
 adobe *volume 1 page 30*
- Mediterranean Sea**
 MAIN ARTICLE *volume 8 page 94*
 MORE TO EXPLORE
 earthquake *volume 4 page 92*
 images
 Algerian coast *picture, volume 1 page 79*
 Amalfi coast *picture, volume 8 page 94*
 Phoenician ship *picture, volume 10 page 74*
 Tel Aviv-Yafo *picture, volume 13 page 33*
 Valletta *picture, volume 8 page 34, picture, volume 14 page 52*
- medium** (physics)
 sound *volume 12 page 134, picture, volume 12 page 134*
- medley** (swimming)
 swimming *volume 12 page 216*
- Medusa** (Greek mythology)
 Perseus *volume 10 page 60*
- meerkat** (mammal)
 mongoose *volume 8 page 165*
- meet** (athletics): *see in index* track meet
- megalopolis**
 city *volume 3 page 125*

Meghna River (river in Bangladesh)
 fishing boat *picture, volume 2 page 22*

Meharry, Mount (mountain in Western Australia, Australia)
 Western Australia *volume 15 page 30*

Meiji (emperor of Japan)
 MAIN ARTICLE *volume 8 page 95*

MORE TO EXPLORE
 samurai *volume 12 page 25*
 Tokyo *volume 13 page 76*

Meiji Restoration (Japanese history)
 Japan *volume 7 page 15*

Meiji Shrine (shrine in Tokyo, Japan)
 picture, *volume 8 page 95*

Mekong River (river in Southeast Asia)
 MAIN ARTICLE *volume 8 page 96*

MORE TO EXPLORE
 delta region *picture, volume 8 page 96*
 fisherman *picture, volume 1 page 204*

Mekong River delta (region in Vietnam)
 rowboat on waterway *picture, volume 8 page 96*

Melaka (port in Malaysia)
 Malaysia *volume 8 page 28*

Melekeok (capital of Palau)
 Palau *volume 10 page 16*

Melanesia (islands, Pacific Ocean)
 Oceania *volume 9 page 119*

Melanesian (people)
 Papua New Guinea *volume 10 page 29*
 Solomon Islands *volume 12 page 129*

melanin (biological pigment)
 skin *volume 12 page 101*

Melbourne (state capital of Victoria, Australia) *picture, volume 1 page 230*
 Victoria *volume 14 page 77*

melody (music)
 music *volume 8 page 212*

melon (plant and fruit)
 MAIN ARTICLE *volume 8 page 96, picture, volume 8 page 97*

MORE TO EXPLORE
 harvest in Israel *picture, volume 6 page 169*

Memorial Day (United States holiday)
 MAIN ARTICLE *volume 8 page 97, picture, volume 8 page 97*

memory (mental function)

MAIN ARTICLE *volume 8 page 98, picture, volume 8 page 98*

MORE TO EXPLORE

Alzheimer's disease *volume 1 page 91*

memory, computer: *see in index* computer memory

Memphis (ancient city in Egypt)
ancient Egypt *volume 4 page 114*

men

biology

endocrine system *volume 4 page 135*

reproductive system *volume 11*

page 47, picture, volume 11 page 47

gymnastics *volume 5 page 174, picture, volume 5 page 175*

Me-Na-Wa (Creek chief) *picture, volume 3 page 212*

Mende (people)

Sierra Leone *volume 12 page 85*

Mendel, Gregor (Austrian botanist)
genetics *volume 5 page 95*

Mendoza, Antonio de (viceroy of New Spain)
Coronado *volume 3 page 200*

Menelik II (emperor of Ethiopia)
Addis Ababa *volume 1 page 29*

Menéndez de Avilés, Pedro (Spanish conquistador)
Florida *volume 5 page 36*
Saint Augustine *volume 12 page 10*

Menes (king of Egypt)
ancient Egypt *volume 4 page 113*

"Meninas, Las" (painting by Velázquez)
picture, volume 14 page 61

meningitis (disease)

MAIN ARTICLE *volume 8 page 99*

MORE TO EXPLORE

nervous system *volume 9 page 36*

Menlo Park, Wizard of (U.S. inventor):
see in index Edison, Thomas Alva

menorah (candelabrum) *picture, volume 6 page 15*
Hanukkah *volume 6 page 15*

Menshevik (Russian political party)
Lenin *volume 7 page 130*
Stalin *volume 12 page 176*

menstruation (physiology)

adolescence *volume 1 page 31*

reproductive system *volume 11 page 48*

mental depression (psychology): *see in index* depression

mental illness

MAIN ARTICLE *volume 8 page 100*

MORE TO EXPLORE

art therapy *picture, volume 8 page 101*

Mercalli scale (seismology)
earthquake *volume 4 page 93*

Mercato (market in Addis Ababa, Ethiopia)
Addis Ababa *volume 1 page 28*

Mercator, Gerardus (Flemish cartographer)
atlas *volume 1 page 223*

"Mercure galant, Le" (French magazine)
magazine *volume 8 page 15*

Mercury (Roman god)
Hermes *volume 6 page 46*

Mercury (planet)
MAIN ARTICLE *volume 8 page 101, picture, volume 8 page 102*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*

solar system *volume 12 page 127, picture, volume 12 page 127*

Meredith, James (U.S. civil rights activist and author)
MAIN ARTICLE *volume 8 page 103, picture, volume 8 page 103*

meridian (geography)
latitude and longitude *volume 7 page 114*

Merina (people)
Madagascar *volume 8 page 9*

Merisi, Michelangelo (Italian painter):
see in index Caravaggio

merlin (bird)
falcon *volume 5 page 4*

merlion (imaginary creature)
statue in Singapore *picture, volume 12 page 91*

mermaid (legendary being)
fairytale *picture, volume 1 page 128*
legendary animals *volume 1 page 128*

manatee *volume 8 page 39*

Meron, Mount (mountain peak in Israel)
Israel *volume 6 page 168*

"Merrimack" (Confederate ship)
American Civil War *volume 1 page 97*

Merychippus (fossil equine genus)
evolution *picture, volume 4 page 170*

mesa (geological feature)
high mesa in New Mexico *picture, volume 9 page 52*

Mesa Verde National Park (national park in Colorado, U.S.)
Cliff Palace *picture, volume 1 page 114, picture, volume 3 page 158*
Colorado history *volume 3 page 158*

Mesopotamia (historical region in the Middle East)

MAIN ARTICLE *volume 8 page 104*

MORE TO EXPLORE

Asia *volume 1 page 204*

banking *volume 2 page 25*

city *volume 3 page 125*

city-state *volume 3 page 126*

civilization *volume 3 page 127*

Euphrates *volume 4 page 159*

Fertile Crescent *volume 5 page 13*

Tigris River *volume 13 page 66*

writing system *picture, volume 15 page 77*

Mesopotamia (region in Argentina)
Argentina *volume 1 page 175*

mesosphere (atmospheric region)
atmosphere *volume 1 page 223*

Mesozoic era (prehistoric time period)
geology *volume 5 page 97*
prehistoric life *volume 10 page 145, table, volume 10 page 145*

Mesquakie (Native American people): *see in index* Fox

mestizo (people)
Honduras *volume 6 page 77*
Mexico *volume 8 page 111*
Panama *volume 10 page 21*
Paraguay *volume 10 page 30*
Peru *volume 10 page 64*

metabolism (biological process)
endocrine system *volume 4 page 135*

metacarpal (bone)
arm *picture, volume 1 page 182*

Metacom (Wampanoag chief)

MAIN ARTICLE *volume 8 page 104*, *picture, volume 8 page 105*

MORE TO EXPLORE

King Philip's War *volume 7 page 67*

Massasoit *volume 8 page 75*

Wampanoag *volume 15 page 7*

metal (family of chemical elements)

MAIN ARTICLE *volume 8 page 105*

MORE TO EXPLORE

crystal *volume 3 page 226*

metalwork chair *picture, volume 8 page 106*

mineral *volume 8 page 131*

money *volume 8 page 160*

periodic table *table, volume 3 page 86*

sculpture *volume 12 page 55*

metallurgy (science of metals)

metal *volume 8 page 106*, *picture, volume 8 page 106*

metalwork

garden chair *picture, volume 8 page 106*

metamorphic rock (geology)

rock *volume 11 page 76*

slate *picture, volume 11 page 76*

metamorphosis (biology)

MAIN ARTICLE *volume 8 page 107*, *picture, volume 8 page 107*

MORE TO EXPLORE

amphibians *volume 1 page 111*

fish

eel *volume 4 page 108*

lamprey *volume 7 page 103*

insect *volume 6 page 139*

beetle *volume 2 page 49*

butterfly and moth *volume 2 page 158*

meteor (astronomy)

MAIN ARTICLE *volume 8 page 108*

MORE TO EXPLORE

asteroid *volume 1 page 213*

Meteor Crater (crater in Arizona, U.S.)

picture, volume 8 page 108

meteor and meteorite *volume 8 page 108*

meteorite (astronomy)

MAIN ARTICLE *volume 8 page 108*, *picture, volume 8 page 108*

MORE TO EXPLORE

asteroid *volume 1 page 213*

iron *volume 6 page 158*

meteoroid (astronomy)

meteor and meteorite *volume 8 page 108*

meteorology (science)

cloud *volume 3 page 144*

drought *volume 4 page 77*

satellite images of Hurricane Katrina *picture, volume 15 page 28*

weather *volume 15 page 28*

meteor shower (astronomy)

comet *volume 3 page 166*

meter (literature)

poetry *volume 10 page 105*

meter (music)

music *volume 8 page 212*

meter (unit of measurement)

common abbreviations *table, volume 1 page 8*

measurement *volume 8 page 90*

methane (chemical compound)

Neptune *volume 9 page 33*

Métis (people of European and Native American descent)

Alberta *volume 1 page 69*

Manitoba *volume 8 page 44*

Saskatchewan *volume 12 page 40*

metre (unit of measure): *see in index*

meter

metre (music): *see in index***metre** (literature): *see in index***metric system** (measurement system)

measurement *volume 8 page 90*

Metropolitan Opera Association (U.S.)

opera company)

Anderson *volume 1 page 117*

Metropolitan Swimming Clubs of London

(British sports organization): *see in index* Amateur Swimming Association

Mewuk (Native American people): *see in index*

Miwok

Mexican American (people)

Hispanic Americans *volume 6 page 61*

New Mexico *volume 9 page 51*

quinceañera *picture, volume 6 page 61*

Mexican-American War (Mexican-U.S.)

history, 1846-1848): *see in index* Mexican War

Mexican Revolution

Mexico *volume 8 page 112*

Mexico City *volume 8 page 114*

Villa *volume 14 page 90*

Zapata *volume 15 page 102*

Mexican War (Mexican-U.S. history, 1846-48)

MAIN ARTICLE *volume 8 page 108*, *picture, volume 8 page 109*

MORE TO EXPLORE

California *volume 3 page 13*

Davis *volume 4 page 18*

Grant *volume 5 page 137*

Mexico *volume 8 page 112*

New Mexico *volume 9 page 52*

Polk *volume 10 page 116*

Taylor *volume 13 page 22*

Mexico (country in North America)

MAIN ARTICLE *volume 8 page 110*

MORE TO EXPLORE

geography

Chichén Itzá *picture, volume 8 page 82*

Gulf of Mexico *volume 8 page 113*

Iztaccíhuatl volcano *picture, volume 9 page 82*

Latin America *volume 7 page 112*

North America *volume 9 page 79*

Teotihuacán *picture, volume 8 page 110*

history

California *volume 3 page 13*

Los Angeles *volume 7 page 178*

Cortés *volume 3 page 201*

Gadsden Purchase *volume 5 page 79*

Hidalgo y Costilla *volume 6 page 51*

New Mexico *volume 9 page 52*

Spanish missions *volume 8 page 140*

Texas *volume 13 page 52*

timeline *volume 8 page 110*

United States *volume 14 page 29*

Utah *volume 14 page 45*

people and culture

Ballet Folklórico de México *picture, volume 8 page 111*

Cinco de Mayo *volume 3 page 118*, *picture, volume 3 page 118*

musicians in Mazatlán *picture, volume 7 page 113*

Olmec *volume 9 page 132*

Orozco's "Zapatistas" *picture, volume 10 page 11*

Toltec *volume 13 page 78*

traditional woven blankets *picture, volume 4 page 25*

Yaqui *volume 15 page 88*

Mexico, Gulf of (gulf in North America)

MAIN ARTICLE *volume 8 page 113*, *picture*, *volume 8 page 113*

MORE TO EXPLORE

sand dune *picture*, *volume 13 page 51*

Mexico City (capital city of Mexico)

MAIN ARTICLE *volume 8 page 113*, *picture*, *volume 8 page 114*

MORE TO EXPLORE

Mexico *volume 8 page 110*

Mgahinga (extinct volcano in Central Africa)

Virunga Mountains *volume 14 page 97*

MI6 (British government): *see in index*

Secret Intelligence Service

Miami (city in Florida, U.S.)

Little Havana *picture*, *volume 6 page 62*

South Beach *picture*, *volume 5 page 35*

Michelangelo (Italian artist)

MAIN ARTICLE *volume 8 page 114*

MORE TO EXPLORE

Renaissance *volume 11 page 46*

sculpture *volume 12 page 56*

“Pietà” *picture*, *volume 8 page 115*

Michigan (state in the U.S.)

MAIN ARTICLE *volume 8 page 116*

MORE TO EXPLORE

geography

Grand Haven lighthouse *picture*, *volume 8 page 116*

Lake Superior *picture*, *volume 12 page 206*

Sault Sainte Marie canals *volume 12 page 47*

State Capitol *picture*, *volume 7 page 106*

Upper Peninsula *picture*, *volume 8 page 117*

Michigan, Lake (lake in the U.S.)

MAIN ARTICLE *volume 8 page 118*, *picture*, *volume 8 page 118*

MORE TO EXPLORE

Chicago *picture*, *volume 3 page 93*

Great Lakes *volume 5 page 147*

Mickey Mouse (cartoon character)

pictured with Walt Disney *picture*, *volume 4 page 57*

Micmac (Native American people)

New Brunswick *volume 9 page 43*

Prince Edward Island *volume 10*

page 151

microbe (organism that causes disease):

see in index germ

microchip (electronics): *see in index* integrated circuit

microeconomics

economics *volume 4 page 100*

micro-jet irrigation system (agricultural technology) *picture*, *volume 1 page 49*

Micronesia (region, Oceania)

Oceania *volume 9 page 119*

Micronesia, Federated States of (island country in the Pacific Ocean)

MAIN ARTICLE *volume 8 page 119*

MORE TO EXPLORE

fishing net *picture*, *volume 8 page 119*

microorganism (organism that causes disease): *see in index* germ

microphone (technology)

hidden microphones *picture*, *volume 12 page 169*

microprocessor

computer *volume 3 page 172*

microscope (instrument)

MAIN ARTICLE *volume 8 page 120*, *picture*, *volume 8 page 120*

MORE TO EXPLORE

anatomy *volume 1 page 115*

compound microscope *picture*, *volume 8 page 120*

Microsoft Corporation (U.S. company)

Washington *volume 15 page 15*

microwave (physics)

radiation *volume 11 page 17*

types of electromagnetic radiation *picture*, *volume 11 page 18*

telecommunication antennas *picture*, *volume 13 page 34*

Midas (Greek mythology)

MAIN ARTICLE *volume 8 page 121*, *picture*, *volume 8 page 121*

Mid-Atlantic Ridge (submarine mountain range, Atlantic Ocean)

Atlantic Ocean *volume 1 page 220*

midbrain (animal anatomy)

brain *volume 2 page 122*, *picture*, *volume 2 page 122*

Middle Ages (AD 500–1500)

MAIN ARTICLE *volume 8 page 122*

MORE TO EXPLORE

arts

architecture *volume 1 page 169*

castle *volume 3 page 52*

Chartres Cathedral *picture*, *volume 8 page 123*

gargoyle *volume 5 page 90*

book illustration *picture*, *volume 8 page 122*

dance *volume 4 page 13*

painting *volume 10 page 8*

theater *volume 13 page 58*

history

Christianity *volume 3 page 114*

city-state *volume 3 page 126*

Crusades *volume 3 page 223*

human migration *volume 8 page 127*

Renaissance *volume 11 page 44*

people and culture

armor *volume 1 page 187*, *picture*, *volume 1 page 186*

cat *volume 3 page 58*

knight *volume 7 page 74*

May Day *volume 8 page 83*

monk *volume 8 page 166*

social issues

feudalism *volume 5 page 13*

labor *volume 7 page 96*, *picture*, *volume 7 page 96*

slavery *volume 12 page 106*

technology and invention *volume 13 page 25*

Middle American Indian (Native American peoples)

arts: *see in index* Native American arts

Central America: *see in index* Central American Indian

Columbus *volume 3 page 162*

Mexico *volume 8 page 111*

middle course (river)

river *volume 11 page 68*

middle-distance race (footrace)

track and field *volume 13 page 85*

middle ear (anatomy)

ear *volume 4 page 87*, *picture*, *volume 4 page 87*

Middle East (region in Asia, Africa, and Europe)

MAIN ARTICLE *volume 8 page 123*, *picture*, *volume 8 page 124*

MORE TO EXPLORE

alphabet *volume 1 page 88*
 Asia *volume 1 page 200*
 Iron Age *volume 6 page 158*
 technology and invention *volume 13 page 25*
 World War I *volume 15 page 63*

Middle Eastern and North African peoples: *see in index* Arab; Bedouin; Berber; Hittite; Kurd; Phoenician

Middle Kingdom (Egyptian history)
 ancient Egypt *volume 4 page 114*

middle school: *see in index* secondary education

midfielder (soccer position)
 soccer *volume 12 page 117*

Midland Valley (region in Scotland, United Kingdom): *see in index* Central Lowlands

midland water snake (reptile)
 various snakes *picture, volume 12 page 113*

midnight sun (polar region phenomenon)
 seasons *volume 12 page 62*

“Midsummer Night’s Dream, A” (play by Shakespeare)
 performance *picture, volume 4 page 73*

Midway, Battle of (Japanese-U.S. history)
 World War II *volume 15 page 69*

Mies van der Rohe, Ludwig (German-born U.S. architect)
 architecture *volume 1 page 172, picture, volume 1 page 171*

migrant: *see in index* migration

migrant labor
 Chavez *volume 3 page 84*
 Hispanic Americans *volume 6 page 62*

migration (animal)
 MAIN ARTICLE *volume 8 page 125*

MORE TO EXPLORE

butterfly and moth *volume 2 page 158*
 eel *volume 4 page 108*
 goose *volume 5 page 127*
 lemming *volume 7 page 126*
 whale *volume 15 page 38*

zebras and wildebeests *picture, volume 8 page 125*

migration (human)
 MAIN ARTICLE *volume 8 page 126*

MORE TO EXPLORE

European migration to America *picture, volume 8 page 128*
 immigrants at Ellis Island *picture, volume 4 page 128*
 Muslim migration to Europe *picture, volume 8 page 128*

migratory labor: *see in index* migrant labor

mihrab (Islamic architecture)
 mosque *volume 8 page 189*

Mikeno (extinct volcano in Central Africa)
 Virunga Mountains *volume 14 page 97*

mildew (fungus)
 parasite *volume 10 page 33*

mild pepper (plant)
 pepper *volume 10 page 59*

Mile High City (state capital of Colorado, U.S.): *see in index* Denver

military: *see in index* armed forces

military dictatorship (form of government)
 dictatorship *volume 4 page 46*

militia
 minuteman *volume 8 page 137*

“Militia Company of Captain Frans Banning Cocq, The” (painting by Rembrandt): *see in index* “Night Watch, The”

Milky Way (galaxy)
 MAIN ARTICLE *volume 8 page 129, picture, volume 8 page 129*

MORE TO EXPLORE

galaxy *volume 5 page 81*
 solar system *volume 12 page 127*
 star *volume 12 page 179*
 universe *volume 14 page 37*

Millennium Park (park in Chicago, Illinois, U.S.) *picture, volume 13 page 21*
 sculpture and music pavilion *picture, volume 3 page 92*

Miller, Arthur (U.S. playwright)
 drama *volume 4 page 74*

millet (grain)
 MAIN ARTICLE *volume 8 page 129, picture, volume 8 page 130*

MORE TO EXPLORE

Nigerian woman pouring millet *picture, volume 5 page 135*

milling (food processing)
 rice *volume 11 page 63*

millipede (many-footed animal)
 MAIN ARTICLE *volume 3 page 72*

Milon of Croton (Greek athlete)
 wrestling *volume 15 page 74*

Milwaukee (city in Wisconsin, U.S.)
 Wisconsin *picture, volume 15 page 53*

Milwaukee Art Museum (museum in Wisconsin, U.S.) *picture, volume 15 page 53*

mimicry (biology)
 MAIN ARTICLE *volume 8 page 130, picture, volume 8 page 130*
 MORE TO EXPLORE
 protective coloration *volume 10 page 157*

minaret (Islamic architecture)
 mosque *volume 8 page 189*
 Samarra, Iraq *picture, volume 6 page 151*

minbar (Islam)
 mosque *volume 8 page 189*

Mindanao (island, Philippines)
 Philippines *volume 10 page 71*

mine (underground tunnel for extraction of ore): *see in index* mining

mineral
 MAIN ARTICLE *volume 8 page 131*

MORE TO EXPLORE

food and nutrition *volume 5 page 44*
 jewelry and gems *volume 7 page 24*
 salt *picture, volume 8 page 131*
 sand *volume 12 page 27*
 soil *volume 12 page 124*

Minerva (Roman goddess)
 Athena *volume 1 page 218*

Ming Dynasty (Chinese history)
 Mongol Empire *volume 8 page 162*

miniature painting (art)
 painting *volume 10 page 8*

miniature schnauzer (breed of dog)
 terrier breeds *table, volume 4 page 62*

mini-flyweight (weight class in boxing):
see in index strawweight

minimum-security prison
prison *volume 10 page 154*

mining

MAIN ARTICLE *volume 8 page 132*

MORE TO EXPLORE

Africa

South Africa *volume 12 page 138*

South African gold mine *picture, volume 8 page 133*

environmental impact *picture, volume 9 page 21*

industry *volume 6 page 134*

Mongolia *volume 8 page 164*

open pit and tunnel mines *picture, volume 8 page 133*

tundra *volume 13 page 108*

United States and Canada

Wyoming *volume 15 page 80*

Yukon *volume 15 page 97*

mink (mammal)

MAIN ARTICLE *volume 8 page 134, picture, volume 8 page 134*

Minneapolis (city in Minnesota, U.S.)
picture, volume 8 page 135

Minneapolis Lakers (U.S. basketball team): *see in index* Los Angeles Lakers

Minnesota (state in the U.S.)

MAIN ARTICLE *volume 8 page 135*

MORE TO EXPLORE

geography

Boundary Waters Canoe Area *picture, volume 8 page 136*

Cathedral of Saint Paul *picture, volume 12 page 16*

Minnesota Uprising (U.S. history): *see in index* Sioux Uprising

Minoan civilization (ancient Greece)

Aegean civilization *volume 1 page 33*

ancient Greece *volume 5 page 154*

pottery *picture, volume 10 page 139*

minor planet (astronomy): *see in index* asteroid

Minos (Greek mythology)

throne room *picture, volume 1 page 33*

Minsk (capital of Belarus)

MAIN ARTICLE *volume 8 page 137*

MORE TO EXPLORE

Belarus *volume 2 page 52*

celebration marking the end of winter
picture, volume 2 page 52

Palm Sunday *picture, volume 8 page 137*

mintonette (sport): *see in index* volleyball

minute (unit of time)

time *volume 13 page 67*

minuteman (U.S. history)

MAIN ARTICLE *volume 8 page 137, picture, volume 8 page 138*

MORE TO EXPLORE

American Revolution *volume 1 page 99*

Revere *volume 11 page 58*

Miohippus (fossil equine genus)

evolution *picture, volume 4 page 170*

Miraflores (area in Lima, Peru) *picture, volume 7 page 152*

mirage (optical illusion)

MAIN ARTICLE *volume 8 page 138, picture, volume 8 page 138*

Miranda (moon of Uranus)

Uranus *volume 14 page 39*

Miró, Joan (Spanish artist)

painting *volume 10 page 11, picture, volume 10 page 12*

mirror (reflective surface)

MAIN ARTICLE *volume 8 page 139, picture, volume 8 page 139*

MORE TO EXPLORE

laser *picture, volume 7 page 111*

light *picture, volume 7 page 149*

optics *volume 9 page 143*

telescope *volume 13 page 38, picture, volume 13 page 38*

Mirza 'Ali Mohammad (Iranian religious leader): *see in index* Bab, the

Mirza Hoseyn 'Ali Nuri (Iranian religious leader): *see in index* Baha' Ullah

Miscanti, Laguna (lagoon in Chile) *picture, volume 3 page 99*

misdemeanor (crime)

crime *volume 3 page 216*

Mishna (Jewish oral laws)

Talmud *volume 13 page 14*

Misr Bahri (region of the Nile Valley in Africa): *see in index* Lower Egypt

mission, Spanish (Spanish history)

MAIN ARTICLE *volume 8 page 139, table, volume 8 page 140*

MORE TO EXPLORE

Serra *volume 12 page 73*

Missionaries of Charity (Roman Catholic order)

Mother Teresa *volume 13 page 47*

missionary (Christianity): *see in index* missions

Mission Hills (city in California, U.S.)

California missions *table, volume 8 page 140*

missions (Christianity)

Christianity *volume 3 page 114*

Serra *volume 12 page 73*

Spanish mission *volume 8 page 139, table, volume 8 page 140*

Mission San Antonio de Valero (historical Spanish mission in San Antonio, Texas, U.S.)

Alamo *volume 1 page 62*

Mississauga (Native American people):
see in index Ojibwa

Mississippi (state in the U.S.)

MAIN ARTICLE *volume 8 page 141*

MORE TO EXPLORE

geography

Biloxi home and church *picture, volume 8 page 142*

riverboat near Natchez *picture, volume 8 page 141*

State Capitol *picture, volume 7 page 5*

Mississippi, University of (university in Oxford, Mississippi, U.S.)

Meredith *volume 8 page 103, picture, volume 8 page 103*

Mississippi alligator (reptile): *see in index* American alligator

Mississippian culture (prehistoric North American culture)

MAIN ARTICLE *volume 8 page 143*

MORE TO EXPLORE

Illinois *volume 6 page 118*

Mississippian gorget *picture, volume 8 page 143*

mound builders *volume 8 page 194*

Mississippi floodplain (region in the U.S.)

Mississippi *volume 8 page 141*

Mississippi Flyway (bird migration route)

Mississippi River *volume 8 page 144*

Mississippi-Missouri River (river in North America)
facts about North America *volume 9 page 83*
United States *volume 14 page 26*

Mississippi River (in the U.S.)
MAIN ARTICLE *volume 8 page 143*, picture, *volume 8 page 141*, picture, *volume 8 page 144*, picture, *volume 11 page 67*

MORE TO EXPLORE

geography

levee and dike *volume 7 page 136*

Missouri River *volume 8 page 148*

North America *volume 9 page 79*

Ohio River

Ohio River confluence *picture, volume 9 page 127*

United States *volume 14 page 26*

history

De Soto *volume 4 page 41*

Jolliet *volume 7 page 31*, picture, *volume 7 page 31*

La Salle *volume 7 page 109*, picture, *volume 1 page 107*

Marquette *volume 8 page 57*, picture, *volume 8 page 57*

Mississippi steamboat (vessel): *see in index* steamboat

Missouri (Native American people)
MAIN ARTICLE *volume 8 page 145*

MORE TO EXPLORE

Missouri necklace *picture, volume 8 page 145*

Oto *volume 9 page 155*

Missouri (state in the U.S.)
MAIN ARTICLE *volume 8 page 146*

MORE TO EXPLORE

American Civil War *volume 1 page 94*

geography

Gateway Arch *picture, volume 8 page 146*

governor's mansion *picture, volume 7 page 19*

Missouri River *picture, volume 8 page 147*

Missouri Compromise (U.S. history, 1820)
MAIN ARTICLE *volume 8 page 148*, picture, *volume 8 page 148*

MORE TO EXPLORE

American Civil War *volume 1 page 94*

Missouri *volume 8 page 147*

Monroe *volume 8 page 171*

slavery *volume 12 page 107*

Missouri River (river in the U.S.)

MAIN ARTICLE *volume 8 page 148*

MORE TO EXPLORE

Arikara Indians *volume 1 page 177*

United States *volume 14 page 26*

Mississippi River *volume 8 page 144*

Missouri *picture, volume 8 page 147*

Montana *volume 8 page 173*, picture, *volume 8 page 149*

mistletoe (plant) *picture, volume 10 page 33*

parasite *volume 10 page 33*

mite (arachnid)

MAIN ARTICLE *volume 13 page 63*

MORE TO EXPLORE

typhus *volume 13 page 124*

Miwok (Native American people)

MAIN ARTICLE *volume 8 page 149*

MORE TO EXPLORE

Miwok sifting basket *picture, volume 8 page 149*

Native Americans *volume 9 page 18*

Mnemosyne (Greek mythology)

Muses *volume 8 page 209*

moa (extinct bird)

flightless birds *volume 2 page 79*

Maori *volume 8 page 47*

Moa Hunters (people): *see in index* Maori

moat (architecture)

castle *volume 3 page 52*, picture, *volume 3 page 53*

Mobile (city in Alabama, U.S.)

Alabama *volume 1 page 60*

mobile phone (communications): *see in index* cell phone

Mobutu, Joseph (president of Zaire)

Democratic Republic of the Congo *volume 3 page 180*

mockernut hickory (tree)

hickory *volume 6 page 50*

mockingbird (bird)

MAIN ARTICLE *volume 8 page 150*, picture, *volume 8 page 150*

MORE TO EXPLORE

songbird *volume 12 page 132*

mode (mathematics)

statistics *volume 12 page 183*

modeling (sculpture)

sculpture *volume 12 page 55*

modem (computer input-output device)

computer *volume 3 page 173*

modern art: *see in index* painting; sculpture

modern dance

Ailey *volume 1 page 50*

dance *volume 4 page 13*

Duncan *volume 4 page 82*

Graham *volume 5 page 134*

modernism (art)

architecture *volume 1 page 172*, picture, *volume 1 page 171*

modernist (art): *see in index* modernism

modesty

clothing *volume 3 page 141*

Modoc (Native American people)

MAIN ARTICLE *volume 7 page 72*

Mogadishu (capital city of Somalia)

MAIN ARTICLE *volume 8 page 151*

MORE TO EXPLORE

children in school *picture, volume 8 page 151*

Somalia *volume 12 page 130*

mogul (skiing)

skiing *volume 12 page 99*

skiing courses *picture, volume 12 page 99*

Mogul architecture: *see in index* Mughal architecture

mohair (fiber)

Angora goat *picture, volume 5 page 121*

Mohammad Reza Shah Pahlavi (shah of Iran)

Iran *volume 6 page 149*

Mohawk (Native American people)

MAIN ARTICLE *volume 8 page 151*

MORE TO EXPLORE

Hiawatha *volume 6 page 49*

Iroquois *volume 6 page 160*

Mohican *volume 8 page 153*

Mohegan (Native American people)

MAIN ARTICLE *volume 8 page 152*

MORE TO EXPLORE

Cochegan Rock *picture, volume 8 page 152*

Pequot *volume 10 page 59*

Mohenjo-daro (ancient city in Pakistan)
Indus Valley civilization *volume 6*
page 135

Mohican (Native American people)
MAIN ARTICLE *volume 8 page 153*

MORE TO EXPLORE
Algonquian *volume 1 page 80*

Mohs scale (mineral)
mineral *volume 8 page 132*

moisture cycle: *see in index* water cycle

Moki (Native American people): *see in index* Hopi

molar (tooth)
teeth *volume 13 page 30*

molasses (syrup)
sugar *volume 12 page 202*

mold (fungus)
fermentation *volume 5 page 11*

mold (technology)
sculpture *volume 12 page 56*

Moldavia (historical region in Europe)
Romania *volume 11 page 85*

molding (technology): *see in index* casting

Moldova (country in Europe)
MAIN ARTICLE *volume 8 page 154*, picture,
volume 8 page 154

mole (mammal)
MAIN ARTICLE *volume 8 page 155*, picture,
volume 8 page 155
MORE TO EXPLORE
tail *volume 13 page 6*

mole (espionage): *see in index* double agent

molecule (chemistry)
MAIN ARTICLE *volume 8 page 155*
MORE TO EXPLORE

air *volume 1 page 51*
chemistry *volume 3 page 87*
crystal *volume 3 page 226*
heat *volume 6 page 32*
plastic *volume 10 page 97*
water *volume 15 page 22*, picture, *volume 8 page 155*

molehill (mound)
mole *volume 8 page 155*

Molière (French playwright)
drama *volume 4 page 74*

Moline (city in Illinois, U.S.)
Deere *volume 4 page 27*

mollusk (animal)
MAIN ARTICLE *volume 8 page 156*

MORE TO EXPLORE
animal *volume 1 page 124*
invertebrates *volume 6 page 144*
jewelry and gems *volume 7*
page 24
pearls picture, *volume 7 page 24*
shell *volume 12 page 79*

mollymawk (seabird): *see in index* albatross

molt (physiology)
reptile *volume 11 page 51*

molting (biology)
bird *volume 2 page 78*
feather *volume 5 page 8*
centipede and millipede *volume 3*
page 72
exoskeleton *volume 4 page 173*, picture,
volume 4 page 173
insects *volume 6 page 139*

Moluccas (islands in Indonesia)
East Indies *volume 4 page 94*
Magellan *volume 8 page 15*

Mon (people)
Thailand *volume 13 page 55*

Monaco (country in Europe)
MAIN ARTICLE *volume 8 page 158*, picture,
volume 8 page 158

“**Mona Lisa**” (painting by Leonardo da Vinci)
Leonardo da Vinci *volume 7 page 132*
Renaissance *volume 11 page 46*

monarch (ruler)
monarchy *volume 8 page 159*

monarch butterfly (insect) picture, *volume 2 page 158*
butterfly and moth *volume 2 page 158*

monarchy (form of government)
MAIN ARTICLE *volume 8 page 159*

MORE TO EXPLORE
Enlightenment opposition *volume 4*
page 143
government *volume 5 page 132*
republic *volume 11 page 53*

monastery (housing for religious order)
images
Armenia picture, *volume 1 page 184*

Bhutan picture, *volume 2 page 66*
Macedonia picture, *volume 8 page 5*
Mongolia picture, *volume 14 page 8*
Poland picture, *volume 10 page 108*
Tunisia picture, *volume 13 page 110*
United Kingdom picture, *volume 14*
page 18
monk *volume 8 page 165*

Monegasque (nationality)
Monaco *volume 8 page 158*

Monera (biology)
classification picture, *volume 7 page 168*
living thing *volume 7 page 169*
species on earth picture, *volume 7*
page 167

Monet, Claude (French painter)
MAIN ARTICLE *volume 8 page 160*, picture,
volume 8 page 160
MORE TO EXPLORE
painting *volume 10 page 10*

money
MAIN ARTICLE *volume 8 page 160*, picture,
volume 8 page 160

money rate (finance): *see in index* interest

Mongol (people)
archery *volume 1 page 166*

Mongol Dynasty (Chinese history): *see in index* Yuan Dynasty

Mongol Empire (historic empire in Asia)
MAIN ARTICLE *volume 8 page 161*
MORE TO EXPLORE

history
Asia *volume 1 page 204*
China *volume 3 page 103*
Genghis Khan *volume 5 page 96*
Iraq *volume 6 page 152*
Mongolia *volume 8 page 163*
Russia *volume 11 page 106*

Mongolia (country in Asia)
MAIN ARTICLE *volume 8 page 163*
MORE TO EXPLORE

elderly people picture, *volume 14 page 8*
Genghis Khan *volume 5 page 95*
girl holding a lamb picture, *volume 8*
page 164
Hun *volume 6 page 99*
yurt picture, *volume 8 page 164*

Mongolia, Inner (autonomous region of China): *see in index* Inner Mongolia

Mongolian gerbil (mammal)
gerbil *volume 5 page 104*

mongoose (mammal family)
MAIN ARTICLE *volume 8 page 165*, picture,
volume 8 page 165

“Monitor” (U.S. ship)
American Civil War *volume 1 page 97*

monk (monasticism)
MAIN ARTICLE *volume 8 page 165*
MORE TO EXPLORE

Buddhism *volume 2 page 145*, picture,
volume 2 page 143, picture, *volume 2*
page 144, picture, *volume 8 page 166*
calligraphy *volume 3 page 15*
Jainism *volume 7 page 9*

monkey (primate)
MAIN ARTICLE *volume 8 page 166*, picture,
volume 8 page 167
MORE TO EXPLORE
ebony langur *picture, volume 8 page 168*
olive baboons *picture, volume 8*
page 168
tail *volume 13 page 6*

Monks Mound (archaeological site in
Illinois, U.S.)
Mississippian culture *volume 8 page 143*

Monmouth, Battle of (American Revolution, 1778)
American Revolution *volume 1*
page 101
Molly Pitcher in battle *picture, volume 1*
page 102

mono (disease): *see in index* mononucleosis

Monomotapa empire (African kingdom)
MAIN ARTICLE *volume 8 page 169*

Monongahela River (river in the U.S.)
Allegheny and Ohio rivers *picture, volume 10 page 57*
Ohio River *volume 9 page 127*

mononucleosis (disease)
MAIN ARTICLE *volume 8 page 170*

monopoly (economics)
trade *volume 13 page 88*

monorail (railway)
railroad *volume 11 page 20*

monotreme (egg-laying mammal): *see in index* echidna; platypus

monozygotic twin: *see in index* identical twin

Monroe, James (president of the U.S.)
MAIN ARTICLE *volume 8 page 170*, picture,
volume 8 page 170

MORE TO EXPLORE
Adams *volume 1 page 25*
timeline *volume 8 page 170*

Monroe Doctrine (U.S. history)
Adams *volume 1 page 25*
Monroe *volume 8 page 172*
Roosevelt *volume 11 page 95*

Monrovia (capital city of Liberia)
MAIN ARTICLE *volume 8 page 172*
MORE TO EXPLORE
government buildings *picture, volume 8*
page 172
Liberia *volume 7 page 139*

monsoon (weather)
Indian Ocean *volume 6 page 129*
Thailand *volume 13 page 54*
wind *volume 15 page 48*

monsoon rain forest
rain forest *volume 11 page 23*

“Montage of a Dream Deferred” (book
by Hughes)
Hughes *volume 6 page 92*

Montagne Pelée (volcano in Martinique): *see in index* Pelée, Mount

montaña (region in South America)
Peru *volume 10 page 64*

Montana (state in the U.S.)
MAIN ARTICLE *volume 8 page 173*
MORE TO EXPLORE

geography
Glacier National Park *picture, volume 8 page 174*
Little Bighorn Battlefield National Monument *picture, volume 8*
page 174
Missouri River *picture, volume 8*
page 149

Monte Albán (historical city in Mexico)
Zapotec *volume 15 page 103*

Montenegrin (people)
Montenegro *volume 8 page 175*

Montenegro (country in Europe)
MAIN ARTICLE *volume 8 page 175*
MORE TO EXPLORE
Serbia *volume 12 page 71*

Sveti Stefan *picture, volume 8 page 175*
Yugoslavia *volume 15 page 95*

Monte Rosa (mountain group in Europe)
Italy *volume 6 page 172*

Montevideo (capital city of Uruguay)
MAIN ARTICLE *volume 8 page 176*, picture,
volume 8 page 176
MORE TO EXPLORE
Uruguay *volume 14 page 42*

Montezuma II (Aztec emperor)
Aztec *volume 1 page 240*
chocolate *volume 3 page 109*
Cortés *volume 3 page 201*

Montgolfier, Jacques-Étienne (French aviator)
airplane *volume 1 page 57*
balloon *volume 2 page 16*

Montgolfier, Joseph-Michel (French aviator)
airplane *volume 1 page 57*
balloon *volume 2 page 16*

Montgomery (state capital of Alabama, U.S.)
MAIN ARTICLE *volume 8 page 176*
MORE TO EXPLORE
Abernathy *volume 1 page 9*
Alabama *volume 1 page 60*
Montgomery bus boycott *picture, volume 8 page 177*

Montgomery, Lucy Maud (Canadian author)
literature for children *volume 7*
page 164

Montgomery bus boycott (U.S. history, 1955)
50th anniversary *picture, volume 8*
page 177
King *volume 7 page 66*
Parks *volume 10 page 36*

month
calendar *volume 3 page 9*
time *volume 13 page 67*

Monticello (building in Virginia, U.S.)
Jefferson *volume 7 page 17*

Montpelier (state capital of Vermont, U.S.)
MAIN ARTICLE *volume 8 page 177*, picture,
volume 8 page 177

Montreal (city in Quebec, Canada)
outdoor dining *picture*, *volume 3*
page 25

Montreux Jazz Festival (music festival in Switzerland)
performance by Youssou N'Dour *picture*, *volume 15* *page 60*

Monts, Pierre de (French explorer)
Nova Scotia *volume 9* *page 102*

Monument to the Discoverers (monument in Lisbon, Portugal) *picture*, *volume 4* *page 173*

mood disorder (psychology)
mental illness *volume 8* *page 100*

Moon (Earth's satellite)
MAIN ARTICLE *volume 8* *page 178*, *picture*, *volume 8* *page 178*

MORE TO EXPLORE
celestial navigation *picture*, *volume 9* *page 25*
Earth *volume 4* *page 90*
eclipse *volume 4* *page 97*, *picture*, *volume 4* *page 98*
solar eclipse *picture*, *volume 4* *page 98*
gravity attraction with Earth *picture*, *volume 5* *page 144*
Moon phases *picture*, *volume 8* *page 179*
near side craters *picture*, *volume 8* *page 178*
satellite *volume 12* *page 41*
solar system *picture*, *volume 12* *page 127*
tides *volume 13* *page 64*, *picture*, *volume 13* *page 64*

moon (planetary satellite): *see in index* satellite

Moon exploration
Apollo Program *picture*, *volume 4* *page 175*
Armstrong *volume 1* *page 188*

Moor (North African people)
MAIN ARTICLE *volume 8* *page 180*, *picture*, *volume 8* *page 180*

MORE TO EXPLORE
Gibraltar *volume 5* *page 114*
Mali *volume 8* *page 32*
Mauritania *volume 8* *page 79*

Moore, Clement C. (U.S. scholar and author)
Santa Claus *volume 12* *page 31*

Moore State Park (park in Massachusetts, U.S.) *picture*, *volume 8* *page 72*

moose (mammal)
MAIN ARTICLE *volume 8* *page 180*, *picture*, *volume 8* *page 181*

MORE TO EXPLORE
deer *volume 4* *page 26*

Moqui (Native American people): *see in index* Hopi

Moravia (historic region in Europe)
Czechoslovakia *volume 3* *page 238*
Czech Republic *volume 3* *page 240*

moray eel (fish)
eel *volume 4* *page 107*

More, Sir Thomas (English humanist and statesman)
utopia *volume 14* *page 46*

Morgan, William G. (U.S. educator)
volleyball *volume 14* *page 104*

Morisco (Spanish Muslim)
Moors *volume 8* *page 180*

"Mormon, Book of" (religious literature)
Mormons *volume 8* *page 182*

Mormonism (religion): *see in index* Mormons

Mormons (religion)
MAIN ARTICLE *volume 8* *page 181*
MORE TO EXPLORE
temple *volume 13* *page 42*
Utah *volume 14* *page 45*
Salt Lake City *volume 12* *page 23*
Temple Square *picture*, *volume 8* *page 182*

Morocco (country in northern Africa)
MAIN ARTICLE *volume 8* *page 183*

MORE TO EXPLORE
geography
date palms and farmers' fields *picture*, *volume 8* *page 184*
market in Marrakech *picture*, *volume 8* *page 184*
Rabat city walls *picture*, *volume 11* *page 13*
Songhai empire *volume 12* *page 133*

Moroni (capital city of Comoros)
MAIN ARTICLE *volume 8* *page 185*, *picture*, *volume 8* *page 185*

MORE TO EXPLORE
Comoros *volume 3* *page 169*

Morris, William (British artist)
wallpaper *picture*, *volume 4* *page 26*

Morrison, Toni (U.S. author) *picture*, *volume 1* *page 45*

Morrow, Tracy (U.S. rapper and actor): *see in index* Ice-T

Morse, Samuel F. B. (U.S. inventor)
Morse Code *volume 8* *page 185*
technology and invention *volume 13* *page 27*
telecommunication *volume 13* *page 34*
telegraph *volume 13* *page 35*

Morse Code (communications system)
MAIN ARTICLE *volume 8* *page 185*, *picture*, *volume 8* *page 186*

MORE TO EXPLORE
telegraph *volume 13* *page 35*

mortar (building material)
brick and tile *volume 2* *page 129*

"Morte Darthur, Le" (stories by Malory)
Arthurian legend *volume 1* *page 194*

Morton, J. Sterling (U.S. politician)
Arbor Day *volume 1* *page 162*

mosaic (art)
ancient Greece *picture*, *volume 5* *page 155*
ancient Rome *picture*, *volume 11* *page 89*
depiction of Empress Theodora *picture*, *volume 2* *page 159*

Moscow (capital city of Russia)
MAIN ARTICLE *volume 8* *page 186*

MORE TO EXPLORE
Cathedral of Saint Basil *picture*, *volume 4* *page 94*, *picture*, *volume 8* *page 186*
massive apartment buildings *picture*, *volume 14* *page 12*
May Day military parade *picture*, *volume 14* *page 14*
Russia and Soviet Union *volume 11* *page 104*, *volume 14* *page 11*

Moscow, Grand Principality of (medieval principality of Russia)
Russia *volume 11* *page 106*

Moses (Hebrew prophet)
MAIN ARTICLE *volume 8* *page 187*
MORE TO EXPLORE
Judaism *volume 7* *page 38*
Moses being found by the pharaoh's daughter *picture*, *volume 8* *page 187*
Passover *volume 10* *page 39*
Yom Kippur *volume 15* *page 94*

moshav (Israeli farming community)
Israel *picture*, volume 6 page 169

Moshoeshoe (African chief)
Maseru volume 8 page 70

mosque (place of worship)
MAIN ARTICLE volume 8 page 188

MORE TO EXPLORE

architecture volume 1 page 170
Abu Dhabi *picture*, volume 1 page 15
Brunei *picture*, volume 2 page 20
Dakar *picture*, volume 4 page 7
Damascus *picture*, volume 4 page 10
Iran *picture*, volume 6 page 148
Iraq *picture*, volume 6 page 151
Istanbul *picture*, volume 6 page 171,
picture, volume 8 page 188
Khartoum mosque *picture*, volume 7
page 61
Male *picture*, volume 8 page 31
Manama *picture*, volume 8 page 39
Nicosia *picture*, volume 9 page 66
Pakistan *picture*, volume 6 page 166
Islam volume 6 page 164
temple volume 13 page 42

mosquito (insect)
MAIN ARTICLE volume 8 page 189, *picture*,
volume 8 page 189

MORE TO EXPLORE

malaria volume 8 page 25
West Nile virus volume 15 page 33

moss (plant)
MAIN ARTICLE volume 8 page 190, *picture*,
volume 8 page 190

MORE TO EXPLORE

bog volume 2 page 99

Mossi (people)
Ouagadougou volume 9 page 157

Mostar (city in Bosnia and Herzegovina)
celebration *picture*, volume 2 page 113

moth (insect)
MAIN ARTICLE volume 2 page 157

Mother Goose (fictional character)
MAIN ARTICLE volume 8 page 190

MORE TO EXPLORE

nursery rhyme volume 9 page 111
“There Was an Old Woman Who Lived
in a Shoe” *picture*, volume 8 page 191

“**Mother Goose’s Melody: or Sonnets
for the Cradle**” (book of rhymes)
literature for children volume 7
page 163

Mother Goose volume 8 page 191

Mother Teresa (Roman Catholic nun):
see in index Teresa, Mother

moth orchid (plant) *picture*, volume 9
page 146

motion (mechanics)
MAIN ARTICLE volume 8 page 191, *picture*,
volume 8 page 191

MORE TO EXPLORE

force volume 5 page 51
machine volume 8 page 7
Newton volume 9 page 56

motion picture: *see in index* movie

motion-picture camera (photography):
see in index movie camera

motion-picture projector
Edison volume 4 page 105

motion sense: *see in index* kinesthesia

motor, electric: *see in index* electric
motor

motorbike: *see in index* motorcycle

motorboat (watercraft)
boat volume 2 page 98, *picture*, volume 2
page 98

motorcar: *see in index* automobile

motorcycle
MAIN ARTICLE volume 8 page 192, *picture*,
volume 8 page 192

motor nerve (physiology)
muscle volume 8 page 208
nervous system volume 9 page 35, *pic-
ture*, volume 9 page 36

motor-paced race (bicycle race)
cycling volume 3 page 235

motor-skill learning (motor develop-
ment): *see in index* psychomotor learn-
ing

motor-skill memory (mental function)
memory volume 8 page 98

Mott, Lucretia (U.S. social reformer)
MAIN ARTICLE volume 8 page 193, *picture*,
volume 8 page 193

MORE TO EXPLORE

Stanton volume 12 page 178
women’s rights volume 15 page 57

motte and bailey castle (military archi-
tecture)

castle volume 3 page 52, *picture*, vol-
ume 3 page 53

mould (fungus): *see in index* mold

mould (technology): *see in index* mold

mound builders (prehistoric North
American culture)
MAIN ARTICLE volume 8 page 194

MORE TO EXPLORE

Alabama volume 1 page 60
Serpent Mound *picture*, volume 8
page 194

Mount: *see in index* under the specific part
of the name, for example, Vesuvius,
Mount except as found below

mountain (landform)
MAIN ARTICLE volume 8 page 195
MORE TO EXPLORE

images
Alps *picture*, volume 12 page 110, *pic-
ture*, volume 12 page 218
hiking *picture*, volume 8 page 195
Juneau *picture*, volume 7 page 39
K2 *picture*, volume 7 page 50
Mount Everest *picture*, volume 4
page 167
Mount Fitzroy *picture*, volume 1
page 118
Mount Kilimanjaro *picture*, volume 7
page 65
Mount Paektu *picture*, volume 7
page 81
Mount Whitney *picture*, volume 12
page 86
New Zealand *picture*, volume 9
page 62
Pyrennes *picture*, volume 10 page 171,
picture, volume 12 page 153
Réunion *picture*, volume 11 page 56
Turkey *picture*, volume 13 page 111

mountain, volcanic (geology and land-
form): *see in index* volcanic mountain

mountain bicycle (vehicle)
bicycle volume 2 page 69

mountain chain (landform): *see in index*
mountain range

mountain climbing (sport)
blind climber *picture*, volume 2 page 90

mountain gorilla (primate)
gorilla volume 5 page 129
Mgahinga Gorilla National Park *picture*,
volume 14 page 4

Virunga Mountains *volume 14 page 97*

mountain laurel (shrub)
laurel *volume 7 page 116*

mountain lion (mammal): *see in index*
puma

mountain man (U.S. history)
Carson *volume 3 page 45*

mountain range (landform)
mountain *volume 8 page 195*
Venus *picture, volume 14 page 66*

mountain zebra
zebra *volume 15 page 102*

Mount Baitou (mountain in North Korea): *see in index* Paektu, Mount

Mountbatten, Philip (British prince): *see in index* Philip, duke of Edinburgh

Mount Hood National Forest (forest in Oregon, U.S.)
Elowah Falls *picture, volume 9 page 147*

Mount Nyamlagiri (mountain in Democratic Republic of the Congo): *see in index* Nyamulagira, Mount

Mount Rushmore National Memorial (monument in South Dakota, U.S.)
Black Hills *volume 2 page 87, picture, volume 2 page 87*
South Dakota *picture, volume 12 page 150*

Mount Rushmore State (state in the U.S.): *see in index* South Dakota

Mount Vernon (historic site in Virginia, U.S.)
Washington *volume 15 page 19*

mourning dove (bird) *picture, volume 10 page 84*

Mousa (emperor of Mali): *see in index*
Musa

mouse (rodent)
MAIN ARTICLE *volume 8 page 196, picture, volume 8 page 196*
MORE TO EXPLORE
rodent *volume 11 page 80*

mouse lemur (primate)
lemur *volume 7 page 128*

mouth (anatomy)
MAIN ARTICLE *volume 8 page 196, picture, volume 8 page 197*

MORE TO EXPLORE

digestive system *volume 4 page 47*
dinosaur *picture, volume 4 page 51*
frog *picture, volume 4 page 48*
grasshopper *picture, volume 4 page 48*
human *picture, volume 4 page 47, picture, volume 13 page 80*

mouth (river)
river *volume 11 page 68*

movable type
Gutenberg *volume 5 page 172*

movement (behavior)
living thing *volume 7 page 168*

movie
MAIN ARTICLE *volume 8 page 197*

MORE TO EXPLORE
censorship *volume 3 page 69*
images
director editing a film *picture, volume 8 page 198*
model ship from the film “Titanic” *picture, volume 8 page 199*
outdoor set with film crew *picture, volume 8 page 197*
poster from “Spider-Man 2” *picture, volume 8 page 199*
preparing a creature for “The Return of the Jedi” *picture, volume 8 page 198*

movie camera (photography)
camera *volume 3 page 21*
movie *volume 8 page 197*

movie projector
movie *volume 8 page 197*

moving picture: *see in index* movie

Mozambique (country in Africa)
MAIN ARTICLE *volume 8 page 200*

MORE TO EXPLORE
Maputo *picture, volume 8 page 52*

Mozart, Wolfgang Amadeus (Austrian composer)
MAIN ARTICLE *volume 8 page 201, picture, volume 8 page 201*
MORE TO EXPLORE
Beethoven *volume 2 page 47*
classical music *volume 3 page 132*
opera *volume 9 page 142*

MP3 player (electronic digital device)
picture, volume 12 page 136

mph (abbreviation)
common abbreviations *table, volume 1 page 8*

MPLA (political organization in Angola): *see in index* Popular Movement for the Liberation of Angola

Mshweshwe (African chief): *see in index*
Moshoeshoe

Mu‘awiyah I (Umayyad caliph)
Caliphate *volume 3 page 14*

mucus (secretion)
amphibians *volume 1 page 109*
cough *volume 3 page 207*
lung *volume 7 page 184*
nose *volume 9 page 99*

mudflow (geology)
landslide *volume 7 page 104*

muffler (engine part)
automobile *volume 1 page 236, picture, volume 1 page 235*

Mugabe, Robert (president of Zimbabwe)
Zimbabwe *volume 15 page 106*

Mughal architecture
Dhaka *volume 4 page 42*
tomb in Agra *picture, volume 1 page 170*

Mughal Empire (history of India)
MAIN ARTICLE *volume 8 page 202, picture, volume 8 page 202*

MORE TO EXPLORE
Bangladesh *volume 2 page 22*
Dhaka *volume 4 page 43*
India *volume 6 page 124*

muhajir (people)
Pakistan *volume 10 page 13*

Muhammad (prophet of Islam)
MAIN ARTICLE *volume 8 page 202*
MORE TO EXPLORE

Arabia
Mecca *volume 8 page 90*
Saudi Arabia *volume 12 page 44*
Caliphate *volume 3 page 14*
Abu Bakr *volume 1 page 14*
Islam *volume 6 page 163*
Islamic statement of faith *picture, volume 8 page 203*
Koran *volume 7 page 77*

Muhammad ‘Abd ar-Ra’uf al-Qudwah al-Husayni (Palestinian leader): *see in index* Arafat, Yasir

Muhammad 'Ali (governor of Egypt)
Egypt *volume 4 page 110*

Muhammad ibn Musa al-Khwarizmi
(Arab astronomer and mathematician):
see in index Khwarizmi, al-

Muhavura (extinct volcano in Central Africa)
Virunga Mountains *volume 14 page 97*,
picture, volume 14 page 97

mujahideen (Afghan rebels)
Afghanistan *volume 1 page 37*

mulatto (people)
French Guiana *volume 5 page 67*
Haiti *volume 6 page 8*

mule (mammal)
donkey *volume 4 page 67*
mule-powered boat *picture, volume 4 page 150*

mule deer (mammal)
animal migration *volume 8 page 125*

multiple fruit (botany)
berry *volume 2 page 64*

Mumbai (city in India)
MAIN ARTICLE *volume 8 page 204*, *picture, volume 8 page 204*

mummy (preserved dead body)
MAIN ARTICLE *volume 8 page 205*, *picture, volume 8 page 205*
MORE TO EXPLORE
ancient Egypt *volume 4 page 113*

mumps (disease)
MAIN ARTICLE *volume 8 page 205*, *picture, volume 8 page 206*

Mumtaz Mahal (Mughal empress)
Taj Mahal *volume 13 page 11*

Munich (city in Germany)
outdoor restaurant *picture, volume 5 page 106*

Munsee (Native American people)
Mohican *volume 8 page 153*

"Muppet Movie, The" (film)
Henson *volume 6 page 41*

Muppets (puppets)
Henson *volume 6 page 40*, *picture, volume 6 page 40*

"Muppet Show, The" (television program)
Henson *volume 6 page 41*

mural (painting)
Rivera *volume 11 page 68*, *picture, volume 11 page 68*

Murasaki Shikibu (Japanese courtier and author)
literature *volume 7 page 161*

Murray River (river in Australia)
South Australia *volume 12 page 145*

Musa (emperor of Mali)
Mali empire *volume 8 page 33*

Muscat (capital city of Oman)
MAIN ARTICLE *volume 8 page 206*, *picture, volume 8 page 206*
MORE TO EXPLORE
Oman *volume 9 page 136*

muscle (anatomy)
MAIN ARTICLE *volume 8 page 207*
MORE TO EXPLORE
hand *volume 6 page 12*
heart *volume 6 page 31*
images
cardiac muscle *picture, volume 8 page 209*
movement and muscle importance
picture, volume 8 page 207, *picture, volume 9 page 36*
muscle–bone relationship *picture, volume 8 page 208*
nervous system *volume 9 page 36*
Parkinson's Disease *volume 10 page 35*
skeletal system *volume 12 page 96*

Muscogee (Native American people): *see in index* Creek

Muscovy (medieval principality of Russia): *see in index* Moscow, Grand Principality of

muscular dystrophy (muscle disease)
genetics *volume 5 page 94*
muscle *volume 8 page 209*

Muses (Greek and Roman mythology)
MAIN ARTICLE *volume 8 page 209*, *picture, volume 8 page 210*
MORE TO EXPLORE
Orpheus and Eurydice *volume 9 page 151*

museum
MAIN ARTICLE *volume 8 page 210*
MORE TO EXPLORE
art museum *picture, volume 8 page 211*
electric spark generator *picture, volume 10 page 79*

exhibit at a science museum *picture, volume 8 page 211*
Field Museum of Natural History *picture, volume 8 page 212*
Hermitage *picture, volume 1 page 196*
Tashkent *picture, volume 13 page 18*

Musharraf, Pervez (Pakistani general and leader)
Pakistan *volume 10 page 15*

mushroom
fungus *volume 5 page 75*

mushroom cloud *picture, volume 2 page 105*

music
MAIN ARTICLE *volume 8 page 212*
MORE TO EXPLORE

dance *volume 4 page 11*
music class *picture, volume 8 page 213*
orchestra *volume 9 page 145*
reading music *picture, volume 8 page 212*

music, African: *see in index* African music

musical form (music): *see in index* form

musical instrument
MAIN ARTICLE *volume 8 page 214*
MORE TO EXPLORE
folk music *volume 5 page 41*
images

Gambian stringed instrument *picture, volume 8 page 214*
keyboard instruments *picture, volume 8 page 217*
orchestral seating arrangement *picture, volume 9 page 145*
percussion instruments *picture, volume 8 page 215*
stringed instruments *picture, volume 8 page 216*
wind instruments *picture, volume 8 page 217*
music *volume 8 page 213*

musical notation
music *volume 8 page 213*
reading music *picture, volume 8 page 212*

musket (gun)
weapon *volume 15 page 26*

Muskogee (Native American people): *see in index* Creek

musk-ox (mammal)

MAIN ARTICLE *volume 8 page 218*, *picture*, *volume 8 page 218*

muskrat (rodent)

MAIN ARTICLE *volume 8 page 218*, *picture*, *volume 8 page 219*

Muslim (religious adherent): *see in index* Islam; Islamic world

Muslim calendar

calendar *volume 3 page 10*

Muslim world (religious and cultural group of peoples): *see in index* Islamic world

mussel (mollusk) *picture*, *volume 8 page 157*

Mussolini, Benito (Italian dictator)

fascism *volume 5 page 7*

Italy *volume 6 page 174*

World War II *volume 15 page 65*

mustard (plant and food)

MAIN ARTICLE *volume 8 page 219*, *picture*, *volume 8 page 219*

mustard oil (essential oil)

mustard *volume 8 page 219*

mustard seed (plant reproductive body)

mustard *volume 8 page 219*

mustelid (mammal): *see in index* weasel family

mutation (biology)

MAIN ARTICLE *volume 8 page 220*

MORE TO EXPLORE

DNA *volume 4 page 61*

evolution *volume 4 page 171*

starfish *picture*, *volume 8 page 220*

mute swan (waterfowl) *picture*, *volume 12 page 210*

swan *volume 12 page 210*

Mutsuhito (emperor of Japan): *see in index* Meiji

mutualism (biology)

symbiosis *volume 12 page 221*

Mwene Matapa (African kings): *see in index* Monomotapa empire

Mwene Mutapa (African kings): *see in index* Monomotapa empire

Myanmar (country in Asia)

MAIN ARTICLE *volume 8 page 221*

MORE TO EXPLORE

geography

Buddhist temples *picture*, *volume 8 page 221*

Sule Pagoda *picture*, *volume 15 page 86*

Mycenaean civilization (ancient Greece)

Aegean civilization *volume 1 page 33*

ancient Greece *volume 5 page 154*

myopia (visual disorder): *see in index* nearsightedness

MyPyramid (diet) *picture*, *volume 5 page 44*

myrrh (gum resin)

Yemen *volume 15 page 91*

Myrtle Beach (city in South Carolina, U.S.) *picture*, *volume 12 page 148*

Mysticeti (mammal): *see in index* baleen whale

Mystic Seaport (museum in Mystic, Connecticut, U.S.) *picture*, *volume 3 page 185*

mythology

MAIN ARTICLE *volume 8 page 222*, *picture*, *volume 8 page 222*

MORE TO EXPLORE

folktale *volume 5 page 42*

storytelling *volume 12 page 194*

Mzizima (historical village in Tanzania): *see in index* Dar es Salaam



N (chemical element): *see in index* nitrogen

N (unit of measurement): *see in index* newton

NAACP (U.S. organization): *see in index* National Association for the Advancement of Colored People

Nabrit, James M. (U.S. lawyer)

school desegregation decision *picture*, *volume 1 page 44*

NAFTA (trade agreement): *see in index*

North American Free Trade Agreement

Nagasaki (city in Japan)

Truman *volume 13 page 101*

World War II *volume 15 page 70*

Nagorno-Karabakh (region in Azerbaijan)

Armenia *volume 1 page 185*

Nahr 'Atbarah (river in Africa): *see in index* Atbara River

Nahuatl language (Native American language)

Aztec *volume 1 page 240*

nail (anatomy)

MAIN ARTICLE *volume 9 page 4*, *picture*, *volume 9 page 4*

nail bed (anatomy)

nail and claw *volume 9 page 4*, *picture*, *volume 9 page 4*

nail plate (anatomy)

nail and claw *volume 9 page 4*, *picture*, *volume 9 page 4*

nail root (anatomy)

nail and claw *volume 9 page 4*

Nairobi (capital city of Kenya)

MAIN ARTICLE *volume 9 page 5*, *picture*, *volume 9 page 5*

MORE TO EXPLORE

Kenya *volume 7 page 58*

Nairobi National Park (park in Kenya)

impalas *picture*, *volume 7 page 59*

Nairobi *volume 9 page 5*

Naismith, James A. (U.S. athlete and educator)

basketball *volume 2 page 35*

Nakota (Native American people)

Assiniboin *volume 1 page 212*

Sioux *volume 12 page 92*

Namib Desert (desert in Africa)

Namibia *volume 9 page 6*

sand dunes *picture*, *volume 9 page 6*

Namibia (country in Africa)

MAIN ARTICLE *volume 9 page 6*

MORE TO EXPLORE

geography

desert mirage *picture, volume 8*
page 138
 Kalahari: *see in index* Kalahari
 Namib Desert *picture, volume 9 page 6*
 Windhoek *picture, volume 15 page 49*
 traditional dress *picture, volume 9 page 7*

Nam Viet (ancient kingdom in Asia)
 Vietnam *volume 14 page 85*

Nanak (Indian religious leader)
 Sikhism *volume 12 page 87*

Nansen, Fridtjof (Norwegian explorer
 and scientist)
 Arctic Ocean *volume 1 page 173*
 refugee *volume 11 page 40*

Nantes, Edict of (French history)
 France *volume 5 page 60*

Napoleon I (emperor of France)
 MAIN ARTICLE *volume 9 page 8, picture,*
volume 9 page 8
 MORE TO EXPLORE
 France *volume 5 page 60*
 French Revolution *volume 5 page 70*
 Louisiana Purchase *volume 7*
page 182

Napoleonic Code (French system of law)
 law *volume 7 page 117*

Napoleon III (emperor of France)
 Cinco de Mayo *volume 3 page 119*

Narcissus (Greek mythology)
 MAIN ARTICLE *volume 9 page 9, picture,*
volume 9 page 9

Narodnaya, Mount (mountain in Russia)
 Ural Mountains *volume 14 page 38*

Narraganset (Native American people)
 MAIN ARTICLE *volume 9 page 10*
 MORE TO EXPLORE
 Narraganset traditional dress *picture,*
volume 9 page 10
 Rhode Island *volume 11 page 61*

“Narrative of Sojourner Truth, The”
 (work by Truth)
 Truth *volume 13 page 102*

**“Narrative of the Life of Frederick
 Douglass, An American Slave, The”**
 (work by Douglass)
 Douglass *volume 4 page 68*

**“Narrow Road to the Deep North,
 The”** (poetic diary by Basho)
 Basho *volume 2 page 33*

narwhal (mammal)
 cetaceans *picture, volume 15 page 37*

NASA (U.S. space agency): *see in index*
 National Aeronautics and Space Admin-
 istration

nasal cavity (anatomy)
 respiratory system *volume 11 page 54*

nasal opening
 nose *volume 9 page 100*

nasal passage
 nose *volume 9 page 99*

Nascimento, Edson Arantes do (Brazil-
 ian athlete): *see in index* Pelé

NASDAQ (U.S. stock exchange)
 stock exchange *volume 12 page 186*

Nashville (city in Indiana, U.S.)
 Brown County State Park *picture, vol-*
ume 6 page 127

Nashville (state capital of Tennessee,
 U.S.)

MAIN ARTICLE *volume 9 page 10*
 MORE TO EXPLORE
 country music *volume 3 page 208*
 Country Music Hall of Fame and
 Museum *picture, volume 9 page 10*
 Tennessee *volume 13 page 43, picture,*
volume 13 page 44

Naskapi (Native American people): *see in*
index Innu

Nassau (capital city of The Bahamas)
 MAIN ARTICLE *volume 9 page 11*

MORE TO EXPLORE
 beach *picture, volume 9 page 11*
 The Bahamas *volume 2 page 8*

Nasser, Gamal Abdel (president of
 Egypt)
 Egypt *volume 4 page 111*
 Sadat *volume 12 page 5*

Nast, Thomas (U.S. political cartoonist)
 Santa Claus *volume 12 page 31, picture,*
volume 12 page 31

Natchez (Native American people)
 MAIN ARTICLE *volume 9 page 12*
 MORE TO EXPLORE
 Natchez house *picture, volume 9 page 12*

nation (politics)
 MAIN ARTICLE *volume 3 page 207*

National Aeronautics and Space

Administration (U.S. space agency)
 Eisenhower *volume 4 page 118*
 space exploration *volume 12 page 151*
 Opportunity *picture, volume 12*
page 152

**National American Woman Suffrage
 Association** (U.S. political organiza-
 tion)
 Anthony *volume 1 page 140*

national anthem
 MAIN ARTICLE *volume 9 page 12*

MORE TO EXPLORE
 Key *volume 7 page 60*

National Assembly (historical French
 parliament)
 French Revolution *volume 5 page 69*

National Assembly for Wales (Welsh
 government)
 Wales *volume 15 page 5*

**National Association for the Advance-
 ment of Colored People** (U.S. organi-
 zation)

MAIN ARTICLE *volume 9 page 13, picture,*
volume 9 page 14

MORE TO EXPLORE
 African Americans *volume 1 page 44*
 civil rights movement *volume 3*
page 129
 Du Bois *volume 4 page 81*
 Marshall *volume 8 page 61*
 Parks *volume 10 page 36*
 Wells-Barnett *volume 15 page 30*

**National Association of Securities
 Dealers Automated Quotations** (U.S.
 stock exchange): *see in index* NASDAQ

National Basketball Association (U.S.
 sports organization)
 basketball *volume 2 page 35*

National Broadcasting Corporation
 (U.S. broadcasting network)
 telecommunication *volume 13 page 34*

National Capital District (capital city of
 Papua New Guinea): *see in index* Port
 Moresby

National Convention (French history)
 French Revolution *volume 5 page 70*

National Council of Negro Women
 (U.S. organization)
 Bethune *volume 2 page 65*

National Farm Workers Association

(U.S. labor union): *see in index* United Farm Workers

National Football League (U.S. sports organization)
football *volume 5 page 50*

national forest

Blue Ridge Mountains *volume 2 page 94*

national government: *see in index* government

National Hockey League

ice hockey *volume 6 page 69*

Nationalist Party (political party in China, 1912-49, and Taiwan, 1949-present)

Chiang Kai-shek *volume 3 page 91*

China *volume 3 page 104*

Mao *volume 8 page 48*

Sun Yat-sen *volume 12 page 205*

Taiwan *volume 13 page 9*

Taipei *volume 13 page 7*

Nationalists (Spanish Civil War group)
Spanish Civil War *volume 12 page 158*

nationality (international law)
citizenship *volume 3 page 121*

National Labor Relations Act (U.S. legislation, 1935)
labor *volume 7 page 97*

national language (legal designation): *see in index* official language

National League (baseball organization)
baseball *volume 2 page 32*

National Liberation Front (political party in Algeria)
Algeria *volume 1 page 79*

national library
library *volume 7 page 142*

National Museum of the American Indian (museum in Washington, D.C., U.S.) *picture, volume 9 page 16*

National Organization for Women (U.S. organization)
women's rights *volume 15 page 57*

National Origins Act (U.S. legislation, 1924): *see in index* Immigration Act

National Palace (palace in Mexico City, Mexico)
Mexico City *volume 8 page 114*

national park

MAIN ARTICLE *volume 9 page 14*

MORE TO EXPLORE

conservation *volume 3 page 188*

macaque monkeys *picture, volume 9 page 14*

National Park Service (U.S. government agency)
national parks *volume 9 page 15*

National Rainbow Coalition (U.S. organization)
Jackson *volume 7 page 7*

National Revolutionary Party (political party in Mexico): *see in index* Institutional Revolutionary Party

National Socialism (political movement in Germany): *see in index* Nazism

National Socialist German Workers' Party (political party in Germany): *see in index* Nazi Party

National Union for the Total Independence of Angola (political organization in Angola)
Angola *volume 1 page 123*

National Woman Suffrage Association (U.S. political organization)
Anthony *volume 1 page 140*

National Youth Administration (U.S. history)
Roosevelt, Eleanor *volume 11 page 92*

Native American (indigenous peoples)
MAIN ARTICLE *volume 9 page 16*

MORE TO EXPLORE

adobe *volume 1 page 30*

ancient cultures: *see in index* Adena culture; Anasazi; Hohokam culture; Hopewell culture; Mississippian culture; mound builders

Arctic peoples: *see in index* Aleut; Eskimo

arts: *see in index* Native American arts
exploration and settlement of the Americas *volume 1 page 104*

Spanish conquistadors *picture, volume 3 page 186*

Spanish missions *volume 8 page 140*

geographic groupings

Central America: *see in index* Central American Indian

Middle America: *see in index* Middle American Indian

North America: *see in index* North American Indian

South America: *see in index* South American Indian

images

Alcatraz Island *picture, volume 9 page 20*

Apache dolls, Cherokee dancer, and Nez Percé group *picture, volume 9 page 18*

Apache *picture, volume 1 page 144*

Cheyenne amulet and Tlingit totem pole *picture, volume 9 page 18*

Comanche boy at Native American celebration *picture, volume 9 page 130*

Cornplanter *picture, volume 12 page 65*

Crow *picture, volume 3 page 221*

Klamath woman preparing food *picture, volume 7 page 73*

Mandan lodge *picture, volume 8 page 40*

Metacom *picture, volume 8 page 105*

National Museum of the American Indian *picture, volume 9 page 16*

Pawnee *picture, volume 10 page 41*

Pomo *picture, volume 10 page 120*

Shauhaunapotinia *picture, volume 6 page 144*

Shawnee *picture, volume 12 page 78*

Sioux *picture, volume 12 page 92*

Spokane *picture, volume 12 page 166*

Standing Bear *picture, volume 10 page 122*

Tlingit *picture, volume 13 page 72*

Tohono O'odham *picture, volume 13 page 75*

Trail of Tears *picture, volume 13 page 89*

Ute petroglyph *picture, volume 14 page 46*

Yaqui *picture, volume 15 page 88*

Zuni *picture, volume 15 page 110*

irrigation *volume 6 page 162*

Latin America *volume 7 page 112*

Native American arts

architecture

Algonquin village *picture, volume 1 page 81*

Anasazi Cliff Palace *picture, volume 1 page 114, picture, volume 3 page 158*

Eskimo family inside igloo *picture, volume 4 page 153*

For more about Native Americans, look for these articles:

<u>ARCTIC</u>	Kaw	Illinois	<u>PLATEAU</u>	<u>SOUTHWEST</u>
Aleut	Kiowa	Iroquois	Coeur d'Alene	Apache
Eskimo	Mandan	Malecite	Flathead	Hopi
	Missouri	Massachuset	Klamath and Modoc	Navajo
<u>CALIFORNIA</u>	Omaha	Mohawk	Kootenai	Pima
Chumash	Osage	Mohegan	Nez Percé	Pueblo Indians
Miwok	Oto	Mohican	Spokane	Tohono O'odham
Pomo	Pawnee	Narraganset	Yakama	Zuni
	Ponca	Nipmuc		
<u>CARIBBEAN</u>	Quapaw	Ojibwa	<u>PREHISTORIC NATIVE</u>	<u>SUBARCTIC</u>
Arawak	Sarcee	Oneida	<u>AMERICANS</u>	Algonquin
Carib	Sioux	Onondaga	Adena Culture	Athapaskan
	Wichita	Pequot	Anasazi	Chipewyan
<u>GREAT BASIN</u>		Potawatomi	Hohokam Culture	Cree
Paiute	<u>MESOAMERICA</u>	Sauk	Hopewell Culture	
Shoshone	<u>(MIDDLE AMERICA)</u>	Seneca	Mississippian Culture	<u>LEADERS</u>
Ute	Aztec	Shawnee	Mound Builders	Cochise
	Maya	Tuscarora		Crazy Horse
<u>GREAT PLAINS</u>	Olmec	Wampanoag	<u>SOUTH AMERICA</u>	Geronimo
Arapaho	Toltec	Wappinger	Inca	Hiawatha
Arikara	Yaqui	Winnebago		Massasoit
Assiniboin	Zapotec	Wyandot	<u>SOUTHEAST</u>	Metacom
Blackfoot			Caddo	Osceola
Cheyenne	<u>NORTHEAST (EASTERN</u>	<u>NORTHWEST COAST</u>	Cherokee	Pontiac
Comanche	<u>WOODLANDS)</u>	Haida	Chickasaw	Sitting Bull
Crow	Abnaki	Kwakiutl	Choctaw	Tecumseh
Gros Ventre	Cayuga	Nootka	Creek	
Hidatsa	Delaware	Tlingit	Natchez	
Iowa	Fox		Seminole	

Inca ruins and stonework *picture, volume 6 page 121, picture, volume 8 page 8*
Mandan lodge *picture, volume 8 page 40*
Mayan ruins *picture, volume 2 page 57, picture, volume 3 page 75, picture, volume 8 page 82*
Serpent Mound *picture, volume 8 page 194*
Zuni adobe houses *picture, volume 10 page 164*
basketry
Carib basket weaver *picture, volume 3 page 40*
Oneida baskets *picture, volume 9 page 137*
Paiute basket weaver *picture, volume 10 page 12*
Pomo Indian basket *picture, volume 10 page 120*
Tohono O'odham Indian basket *picture, volume 13 page 75*

Winnebago basket weaver *picture, volume 15 page 50*
beadwork and decorative art
Chickasaw rattles *picture, volume 3 page 94*
Mississippian gorget *picture, volume 8 page 143*
Missouri necklace *picture, volume 8 page 145*
Quapaw sash *picture, volume 11 page 6*
clothing and blankets
Arapaho traditional clothing *picture, volume 1 page 161*
Assiniboin traditional dress *picture, volume 1 page 211*
Aymara festive clothing *picture, volume 2 page 102*
Blackfoot traditional dress *picture, volume 2 page 85*
Comanche traditional dress *picture, volume 9 page 130*
Cree traditional costume *picture, volume 3 page 212*

Narraganset traditional dress *picture, volume 9 page 10*
Nez Percé blankets *picture, volume 9 page 18*
Omaha traditional clothing *picture, volume 9 page 135*
Pawnee traditional clothing *picture, volume 10 page 41*
Potawatomi dress *picture, volume 10 page 138*
Seminole traditional dress *picture, volume 12 page 64*
Shawnee headdress *picture, volume 12 page 78*
Tlingit traditional clothing *picture, volume 13 page 72*
dance
Cherokee dancers *picture, volume 3 page 88*
Hopi dancers *picture, volume 6 page 83*
Tuscarora dancer *picture, volume 13 page 117*

- painting and drawing
 Aztec drawing *picture, volume 1 page 240*
 Chumash cave painting *picture, volume 3 page 116*
 Hidatsa decorated robe *picture, volume 6 page 52*
 Navajo sand painting *picture, volume 9 page 23*
- sculpture and carving
 Arawak sculpture *picture, volume 1 page 161*
 Caddo figurine *picture, volume 3 page 7*
 Haida wood carving *picture, volume 6 page 6*
 Hohokam rock carvings *picture, volume 6 page 69*
 Hopewell copper work *picture, volume 6 page 83*
 Kwakiutl ceremonial staff *picture, volume 7 page 93*
 Olmec rock sculpture *picture, volume 9 page 132*
 Pequot decorated canoe *picture, volume 10 page 59*
 Toltec statues *picture, volume 13 page 77*
 Ute rock carvings *picture, volume 14 page 46*
 Tlingit totem pole *picture, volume 9 page 18*
 Zuni potter *picture, volume 15 page 110*
- NATO** (international alliance of countries): *see in index* North Atlantic Treaty Organization
- natterjack toad** (amphibian) *picture, volume 13 page 72*
- natural disaster**: *see in index* disaster
- natural fiber** (raw material)
 clothing *volume 3 page 142*
 fibers *volume 5 page 16, picture, volume 5 page 16*
 textile *volume 13 page 53*
- natural gas** (fossil fuel)
 MAIN ARTICLE *volume 5 page 91*
 MORE TO EXPLORE
 energy source *picture, volume 4 page 139*
 fossil fuel *volume 5 page 55*
 geographical reserves
 Africa
 Libya *volume 7 page 145*
 Nigeria *volume 9 page 69*
- Asia
 Kazakhstan *volume 7 page 52*
 Malaysia *volume 8 page 28*
 Myanmar *volume 8 page 221*
 Pakistan *volume 10 page 14*
 Turkmenistan *volume 13 page 115*
 Uzbekistan *volume 14 page 47*
- Australia
 South Australia *volume 12 page 146*
 Victoria *volume 14 page 78*
 Western Australia *volume 15 page 31*
- Central America and West Indies
 Trinidad and Tobago *volume 13 page 97*
- Europe
 Germany *volume 5 page 106*
 Netherlands, The *volume 9 page 39*
 North Sea *volume 9 page 92*
 Norway *volume 9 page 98*
 Romania *volume 11 page 85*
 Russia *volume 11 page 105, picture, volume 5 page 92*
 Scotland *volume 12 page 52*
 Ukraine *volume 14 page 7*
- Middle East
 Oman *volume 9 page 136*
 Qatar *volume 11 page 4*
 United Arab Emirates *volume 14 page 15*
- New Zealand *volume 9 page 62*
- North America
 Mexico *volume 8 page 111*
 Mexico, Gulf of *volume 8 page 113*
 Rocky Mountains *volume 11 page 79*
- South America
 Venezuela *volume 14 page 64*
- natural history museum**
 Field Museum of Natural History *picture, volume 8 page 212*
 museum *volume 8 page 211*
- natural immunity** (physiology)
 immune system *volume 6 page 119, picture, volume 6 page 119*
- naturalization** (citizenship process)
 citizenship *volume 3 page 121*
- natural law**
 human rights *volume 6 page 97*
- natural number** (mathematics)
 numbers and number systems *volume 9 page 105*
- natural resource** (ecology)
 MAIN ARTICLE *volume 9 page 20*
 MORE TO EXPLORE
 conservation *volume 3 page 186*
- natural satellite** (planetary satellite): *see in index* satellite
- natural science**: *see in index* life sciences; physical sciences
- natural selection** (biology)
 adaptation *volume 1 page 27*
 Darwin *volume 4 page 17*
 evolution *volume 4 page 170*
 mutation *volume 8 page 220*
 protective coloration *volume 10 page 157*
- Natural State** (state in the U.S.): *see in index* Arkansas
- Nauru** (island country in the Pacific Ocean)
 MAIN ARTICLE *volume 9 page 22, picture, volume 9 page 22*
- “Nautilus”** (nuclear-powered submarine)
 submarine *volume 12 page 198*
- “Nautilus”** (Fulton’s submarine)
 submarine *volume 12 page 197*
- Navajo** (Native American people)
 MAIN ARTICLE *volume 9 page 23*
 MORE TO EXPLORE
 Arizona *volume 1 page 178*
 Native Americans *volume 9 page 17*
 Navajo sand painting *picture, volume 9 page 23*
 Navajo Supreme Court *picture, volume 5 page 132*
- Navajo Supreme Court** (high court of the Navajo people)
 justices in session *picture, volume 5 page 132*
- naval force** (military force): *see in index* navy
- naval warfare**
 Spanish Armada *volume 1 page 183*
- navel** (anatomy)
 reproductive system *volume 11 page 50*
- navel orange** *picture, volume 9 page 144*
- navigation** (technology)
 MAIN ARTICLE *volume 9 page 23, picture, volume 9 page 24, picture, volume 9 page 24, picture, volume 9 page 25*

MORE TO EXPLORE

gyroscope *volume 5 page 176*

navy (military force)

MAIN ARTICLE *volume 9 page 25*, *picture, volume 9 page 25*

MORE TO EXPLORE

cruiser *picture, volume 3 page 150*

Naypyidaw (capital of Myanmar)

Yangon *volume 15 page 86*

Nazi Party (political party in Germany)

MAIN ARTICLE *volume 9 page 26*

MORE TO EXPLORE

Germany *volume 5 page 106*

Hitler *volume 6 page 65*

Storm Troopers *picture, volume 9 page 26*

Nazism (political movement in Germany)

Holocaust *volume 6 page 71*

Frank *volume 5 page 61*

Jewish identification badges *picture, volume 6 page 71*

Judaism *volume 7 page 39*

Poland *volume 10 page 109*

Warsaw *volume 15 page 14*

Nazi rally in Nuremberg *picture, volume 9 page 26*

Nuremberg trials *volume 9 page 110*

World War II *volume 15 page 65*

NBA (U.S. sports organization): *see in index* National Basketball Association

NBC (U.S. broadcasting network): *see in index* National Broadcasting Corporation

Ndebele (people)

Zimbabwe *volume 15 page 105*

N'Djamena (capital city of Chad)

MAIN ARTICLE *volume 9 page 27*

MORE TO EXPLORE

Chad *volume 3 page 78*

N'Dour, Youssou (Senegalese musician)

picture, volume 15 page 60

Neagh, Lough (lake in Northern Ireland, United Kingdom)

Northern Ireland *volume 9 page 89*

Neanderthal (anthropology)

human lineage *picture, volume 6 page 93*

human origins *volume 6 page 96*

Neanderthal fossil skeleton *picture, volume 6 page 93*

nearsightedness (visual disorder)

concave lens effect *picture, volume 7 page 131*

eye *volume 4 page 176*

lens *volume 7 page 131*

Neathach, Loch (lake in Northern Ireland, United Kingdom): *see in index* Neagh, Lough

Nebraska (state in the U.S.)

MAIN ARTICLE *volume 9 page 28*

MORE TO EXPLORE

geography

Platte River crane migration *picture, volume 9 page 29*

State Capitol *picture, volume 7 page 154*

history

American Civil War *volume 1 page 95*

Arbor Day *volume 1 page 162*

Kansas-Nebraska Act *volume 7 page 49*

Pawnee *volume 10 page 41*

nebula (astronomy)

MAIN ARTICLE *volume 9 page 30*, *picture, volume 1 page 215*, *picture, volume 9 page 30*

necklace (jewelry) *picture, volume 7 page 23*

nectar (botany)

bee *volume 2 page 46*

pollen *volume 10 page 116*

nectarine (fruit)

peach *volume 10 page 45*

Nederlandse Antillen (islands and autonomous part of The Netherlands in the Caribbean Sea): *see in index* Netherlands Antilles

needle (implement)

acupuncture *volume 1 page 20*

needle (plant part): *see in index* leaf

needle lace (decorative fabric)

lace *volume 7 page 99*

Nefertari (queen of Egypt)

decorated tomb *picture, volume 6 page 53*

Nefertiti (queen of ancient Egypt)

painted stone bust *picture, volume 4 page 114*

negative electron (subatomic particle): *see in index* electron

negative ion (chemistry and physics)
atoms *volume 1 page 225*

negative number (mathematics)

numbers and number systems *volume 9 page 106*

Negev (region in Israel) *picture, volume 6 page 168*

Israel *volume 6 page 168*

Negrito (people)

Philippines *volume 10 page 71*

Tasmania *volume 13 page 20*

Negro league (U.S. baseball history)
Paige *volume 10 page 6*

Negro River (river in Uruguay): *see in index* Río Negro

Nehru, Indira (prime minister of India): *see in index* Gandhi, Indira

Nehru, Jawaharlal (prime minister of India)

MAIN ARTICLE *volume 9 page 30*, *picture, volume 9 page 30*

MORE TO EXPLORE

Gandhi, Indira *volume 5 page 85*

Nelson, Gaylord (U.S. senator)
Earth Day *volume 4 page 91*

Nelson, Willie (U.S. musician and singer)
country music *volume 3 page 208*

Nematoda (animal class): *see in index* roundworm

Nemo, Captain (fictional character): *see in index* Captain Nemo

neoclassicism (artistic style)

architecture *volume 1 page 171*

painting *volume 10 page 10*

sculpture *volume 12 page 56*

neofascism (political movement)
fascism *volume 5 page 8*

Neolithic Period (anthropology)
Stone Age *volume 12 page 189*

neo-Nazism

Nazi Party *volume 9 page 27*

neoplasm (medical disorder): *see in index* tumor

Nepal (country in Asia)

MAIN ARTICLE *volume 9 page 31, picture, volume 9 page 31*

MORE TO EXPLORE

geography

Kathmandu *picture, volume 7 page 50, picture, volume 9 page 32*

Mount Everest *volume 4 page 167*

valley *picture, volume 14 page 53*

yak *picture, volume 15 page 84*

Nepalese (Asian people)

Bhutan *volume 2 page 66*

nephron (anatomy)

kidney *volume 7 page 63*

urinary system *picture, volume 14 page 40*

Neptune (planet)

MAIN ARTICLE *volume 9 page 33, picture, volume 9 page 33*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*

solar system *volume 12 page 127, picture, volume 12 page 127*

nerve (anatomy)

nervous system *volume 9 page 35, picture, volume 9 page 35*

skin *volume 12 page 101*

nerve cell (anatomy): *see in index* neuron

nerve fiber (anatomy) *picture, volume 9 page 35*

nerve impulse (physiology) *picture, volume 9 page 35*

nervous system (anatomy and physiology)

MAIN ARTICLE *volume 9 page 34*

MORE TO EXPLORE

human beings *picture, volume 9 page 35, picture, volume 9 page 36*

neuron *picture, volume 9 page 35*

invertebrate animals *picture, volume 9 page 34*

nervous tension (psychological and biological factor): *see in index* stress**Ness, Loch** (lake in Scotland, United Kingdom)

Urquhart Castle *picture, volume 12 page 52*

nest (zoology)

MAIN ARTICLE *volume 9 page 36, picture, volume 9 page 37*

MORE TO EXPLORE

ants *volume 1 page 133, picture, volume 1 page 133*

swan *picture, volume 4 page 101*

wasp *volume 15 page 21*

paper wasp *picture, volume 9 page 37*

potter wasp *picture, volume 15 page 21*

nesting colony (animal behavior)

penguin *volume 10 page 53*

net (sports)

volleyball *volume 14 page 104*

Netanyahu, Benjamin (prime minister of Israel)

signing peace agreement *picture, volume 10 page 19*

Netherlands, The (country in Europe)

MAIN ARTICLE *volume 9 page 38*

MORE TO EXPLORE

geography

Amsterdam *picture, volume 1 page 111*

Keukenhof Gardens *picture, volume 5 page 87*

Kinderdijk *picture, volume 9 page 38*

levee and dike *volume 7 page 136*

The Hague *picture, volume 6 page 6*

history

colonialism

Guyana *volume 5 page 173*

Indonesia *volume 6 page 131*

Jakarta *volume 7 page 9*

Malaysia *volume 8 page 28*

Maldives *volume 8 page 30*

Mauritius *volume 8 page 80*

New York City *volume 9 page 60*

South Africa *volume 12 page 138*

Suriname *volume 12 page 208, picture, volume 10 page 32*

Wappinger *volume 15 page 8*

Europe

Brussels *volume 2 page 138*

Frank *volume 5 page 62*

exploration

East Timor *volume 4 page 96*

exploration and settlement of the Americas *volume 1 page 107*

World War II *volume 15 page 66*

people and culture

garden *picture, volume 5 page 38*

tulips *volume 13 page 106*

girl carrying tulips *picture, volume 9 page 39*

sports and games

golf *volume 5 page 126*

ice skating *volume 6 page 110*

Netherlands, United Provinces of the

(historical state in Europe)

Netherlands *volume 9 page 39*

Netherlands Antilles (islands and autonomous part of The Netherlands in the Caribbean Sea)

The Netherlands *volume 9 page 38*

neural receptor (sense cell): *see in index* receptor**neuron** (anatomy) *picture, volume 9 page 35*

nervous system *volume 9 page 34*

Neuth (Egyptian goddess): *see in index* Nut**neutralism** (international policy)

Sweden *volume 12 page 214*

Switzerland *volume 12 page 219*

neutrality (diplomacy)

Wilson *volume 15 page 47*

neutron (subatomic particle)

atom *volume 1 page 224, picture, volume 1 page 225*

Nevada (state in the U.S.)

MAIN ARTICLE *volume 9 page 40*

MORE TO EXPLORE

geography

mountains and desert *picture, volume 9 page 41*

State Capitol *picture, volume 3 page 45*

Nevi'im (biblical text): *see in index* Prophets**Nevis** (island in the West Indies): *see in index* Saint Kitts and Nevis**Newbery, John** (British publisher)

literature for children *volume 7 page 163*

Mother Goose *volume 8 page 191*

Newbery Medal (literary award)

Cleary *volume 3 page 134*

Konigsburg *volume 7 page 76*

literature for children *volume 7 page 163, picture, volume 7 page 162, picture, volume 7 page 162*

New Brunswick (province in eastern Canada)

MAIN ARTICLE *volume 9 page 42*

MORE TO EXPLORE

geography

Cape Enrage Lighthouse at the Bay of

Fundy *picture, volume 9 page 42*

Northumberland Strait bridge *picture, volume 10 page 151*

world's longest covered bridge *picture, volume 9 page 43*

Newcastle disease (bird disease)

animal disease *volume 4 page 55*

"New Colossus, The" (work by Lazarus)

Statue of Liberty *volume 7 page 140*

Newcombe, Don (U.S. baseball player)

Campanella, Doby, Newcombe, and

Robinson *picture, volume 2 page 32*

Newcomen, Thomas (British engineer and inventor)

technology and invention *volume 13 page 26*

New Deal (U.S. history)

MAIN ARTICLE *volume 9 page 44, picture, volume 9 page 44, picture, volume 9 page 44*

MORE TO EXPLORE

Great Depression *volume 5 page 147*

Roosevelt, Eleanor *volume 11 page 91*

Roosevelt, Franklin *volume 11 page 93*

United States *volume 14 page 30*

New Delhi (capital city of India)

India *volume 6 page 123*

New England (region in the U.S.)

harbor in Maine *picture, volume 8 page 23*

King Philip's War *volume 7 page 67*

town in Vermont *picture, volume 14 page 68*

Newfoundland (island in Newfoundland and Labrador province, Canada)

coastal village *picture, volume 9 page 46*

Newfoundland and Labrador *volume 9*

page 45

Viking buildings *picture, volume 9*

page 46

Newfoundland and Labrador (province in eastern Canada)

MAIN ARTICLE *volume 9 page 45*

MORE TO EXPLORE

island of Newfoundland *picture, volume 9 page 46*

reconstructed Viking buildings,

Newfoundland *picture, volume 9 page 46*

New France (French colonies in North America)

Canada *volume 3 page 25*

Champlain *volume 3 page 80*

French and Indian War *volume 5 page 66*

Quebec *volume 11 page 9*

New Frontier (U.S. history)

Kennedy *volume 7 page 55*

New Granada (historical Spanish colony in South America)

Columbia *volume 3 page 153*

Newgrange tomb (Neolithic tomb in Ireland)

picture, volume 6 page 155

New Hampshire (state in the U.S.)

MAIN ARTICLE *volume 9 page 47*

MORE TO EXPLORE

geography

State Capitol *picture, volume 3 page 175*

White Mountains *picture, volume 9 page 48*

New Hebrides (island country in the Pacific Ocean): *see in index* Vanuatu**New Horizons** (United States spacecraft)

Pluto *volume 10 page 102*

New Jersey (state in the U.S.)

MAIN ARTICLE *volume 9 page 49*

MORE TO EXPLORE

geography

Cape May houses *picture, volume 9 page 50*

State Capitol *picture, volume 13 page 95*

New Kingdom (Egyptian history)

ancient Egypt *volume 4 page 114*

New Mexico (state in the U.S.)

MAIN ARTICLE *volume 9 page 51*

MORE TO EXPLORE

Coronado *volume 3 page 200*

geography

Acoma village *picture, volume 9 page 52*

Santa Fe Museum of Fine Arts *picture, volume 12 page 31*

Very Large Array radio telescopes *picture, volume 13 page 39*

New Orleans (city in Louisiana, U.S.)

jazz *volume 7 page 16*

Preservation Hall Jazz Band *picture, volume 7 page 16*

Louisiana *volume 7 page 181*

Newport (city in Rhode Island, U.S.)

Narragansett Bay harbor *picture, volume 11 page 61*

New River Gorge National River (West Virginia, U.S.)

Sandstone Falls *picture, volume 15 page 34*

news (communication)

newspaper *volume 9 page 54*

news agency (journalism): *see in index* news service**New South Wales** (state in Australia)

MAIN ARTICLE *volume 9 page 53, picture, volume 9 page 53*

MORE TO EXPLORE

Australia *volume 1 page 231*

newspaper

MAIN ARTICLE *volume 9 page 54, picture, volume 9 page 54*

MORE TO EXPLORE

advertising *volume 1 page 32*

printing press *picture, volume 9 page 55, picture, volume 10 page 152*

newsprint (grade of paper)

paper *volume 10 page 28*

news service (journalism)

newspaper *volume 9 page 54*

New Stone Age (anthropology): *see in index* Neolithic Period**New Style calendar**: *see in index* Gregorian calendar**New Testament** (biblical text)

Bethlehem *volume 2 page 64*

Bible *volume 2 page 68*

Greek *picture, volume 2 page 68*

Christianity *volume 3 page 112*

newton (unit of measurement)

force *volume 5 page 51*

Newton, Isaac (English physicist and mathematician)

MAIN ARTICLE *volume 9 page 55, picture, volume 9 page 55*

MORE TO EXPLORE

astronomy *volume 1 page 215*

force *volume 5 page 51*
 gravity *volume 5 page 145*

Newton's law of gravity
 gravity *volume 5 page 145*

Newton's laws of motion (physics)
 force *volume 5 page 51*
 motion *volume 8 page 192*

New Town (district in Edinburgh, Scotland, United Kingdom)
 Edinburgh *volume 4 page 104*

New World (history of exploration): *see in index Americas*

New World beaver (rodent): *see in index American beaver*

New World monkey (primate) *picture, volume 8 page 167*
 monkey *volume 8 page 167*

New World sparrow (bird)
 sparrow *volume 12 page 160*

New World vulture (bird)
 vulture *volume 14 page 106*

New Year festival: *see in index New Year's Day*

New Year's Day (holiday)
 MAIN ARTICLE *volume 9 page 56, picture, volume 9 page 56*

New York (state in the U.S.)
 MAIN ARTICLE *volume 9 page 57*
 MORE TO EXPLORE
 geography
 Adirondack Mountains *picture, volume 9 page 57, picture, volume 9 page 79*
 Lake Ontario *volume 9 page 141*
 Niagara Falls *picture, volume 9 page 58*
 State Capitol *picture, volume 1 page 67*
 history
 Arthur *volume 1 page 192*
 Declaration of Independence *volume 4 page 24*
 Federalist papers *volume 5 page 9*

New York Bay (bay in New York City, New York, U.S.)
 Statue of Liberty *picture, volume 9 page 60*
 Verrazzano *volume 14 page 70*

New York City (city in New York, U.S.)
 MAIN ARTICLE *volume 9 page 60*

MORE TO EXPLORE
 billboards on buildings *picture, volume 1 page 32*
 Central Park aerial view *picture, volume 9 page 59*
 Statue of Liberty *picture, volume 9 page 60*
 UN headquarters *picture, volume 3 page 207*
 United States *volume 14 page 26*
 Vietnam War protesters *picture, volume 14 page 87*

New York City Ballet (U.S. ballet company)
 ballet *volume 2 page 15*
 Tallchief *volume 13 page 12*

New York Cosmos (U.S. soccer team)
 Pelé *volume 10 page 50*

New York Infirmity for Women and Children (clinic in New York City, New York, U.S.)
 Blackwell *volume 2 page 90*

New York Knickerbocker Base Ball Club (U.S. organization): *see in index Knickerbocker Base Ball Club*

New York Stock Exchange (stock exchange, New York City, New York, U.S.) *picture, volume 12 page 186*
 stock exchange *volume 12 page 186*

New York Yankees (U.S. baseball team)
 Ruth *volume 11 page 109*

New Zealand (island country in the Pacific Ocean)
 MAIN ARTICLE *volume 9 page 61*
 MORE TO EXPLORE
 geography
 Maori village *picture, volume 9 page 62*
 Queenstown *picture, volume 9 page 62*
 Wellington *picture, volume 15 page 28*
 people and culture
 Maori greeting *picture, volume 8 page 47*
 women's rights
 Helen Clark *picture, volume 15 page 58*

Nez Percé (Native American people)
 MAIN ARTICLE *volume 9 page 63*
 MORE TO EXPLORE
 Native Americans *volume 9 page 18, picture, volume 9 page 18*

Nez Percé War (U.S. history)
 Nez Percé *volume 9 page 63*

NFL (U.S. sports organization): *see in index National Football League*

NFWA (U.S. labor union): *see in index United Farm Workers*

Ngazidja (island of Comoros)
 Moroni *picture, volume 8 page 185*

Ngo Dinh Diem (Vietnamese political leader)
 Vietnam War *volume 14 page 86*

Ngorongoro Crater (crater, Tanzania)
 picture, *volume 13 page 15*

Nguyen Sinh Cung (president of North Vietnam): *see in index Ho Chi Minh*

Niagara Falls (waterfall in North America) *picture, volume 9 page 58*

Niagara River (river in North America)
 Lake Ontario *volume 9 page 141*

Niamey (capital city of Niger)
 MAIN ARTICLE *volume 9 page 63*
 MORE TO EXPLORE
 Niger *volume 9 page 67*

Niantic (Native American people)
 Narraganset *volume 9 page 10*

Nicaragua (country in Central America)
 MAIN ARTICLE *volume 9 page 64*
 MORE TO EXPLORE
 Managua *picture, volume 8 page 38*

Nicaragua, Lake (lake in Nicaragua)
 Central America *volume 3 page 74*

Nicholas, Saint (bishop of Myra)
 Santa Claus *volume 12 page 30*

Nicholas, Saint (legendary person): *see in index Santa Claus*

Nicholas II (tsar of Russia)
 MAIN ARTICLE *volume 9 page 65, picture, volume 9 page 65*
 MORE TO EXPLORE
 Russia *volume 11 page 106*
 Russian Revolution *volume 11 page 108*
 tsar *volume 13 page 103*

Nicholas of Bari (bishop of Myra): *see in index Nicholas, Saint*

Nicholas of Myra (bishop of Myra): *see in index Nicholas, Saint*

Nicklaus, Jack (U.S. golfer)
golf *volume 5 page 126*

Nicolet, Jean (French explorer)
Wisconsin *volume 15 page 53*

Nicosia (capital city of Cyprus)
MAIN ARTICLE *volume 9 page 66, picture, volume 9 page 66*
MORE TO EXPLORE
Cyprus *volume 3 page 236*

Niemeyer, Oscar (Brazilian architect)
Brasília *picture, volume 2 page 123*

Niger (country in Africa)
MAIN ARTICLE *volume 9 page 67, picture, volume 9 page 67*

Nigeria (country in West Africa)
MAIN ARTICLE *volume 9 page 68*
MORE TO EXPLORE
images
fishermen on the Niger River *picture, volume 9 page 69*
presidential palace *picture, volume 1 page 16*
student reads the Koran *picture, volume 9 page 68*
wedding custom *picture, volume 3 page 230*
woman pouring millet *picture, volume 5 page 135*

Niger River (river in Africa)
Bamako *volume 2 page 18*
fishermen cast a net *picture, volume 9 page 69*

night heron (bird)
heron *volume 6 page 47*

nightingale (bird)
MAIN ARTICLE *volume 9 page 70, picture, volume 9 page 70*

Nightingale, Florence (English nurse)
MAIN ARTICLE *volume 9 page 70, picture, volume 9 page 70*
MORE TO EXPLORE
nursing *volume 9 page 111*

Nightingale School for Nurses (education)
Nightingale *volume 9 page 71*

night monkey (primate)
monkey *volume 8 page 168*

Night of Broken Glass (German history, 1938): *see in index* Kristallnacht

Night of Power (Islam)
Ramadan *volume 11 page 26*

nightshade (plant and flower)
MAIN ARTICLE *volume 9 page 71, picture, volume 9 page 71*
MORE TO EXPLORE
tomato *volume 13 page 78*

“Night Watch, The” (painting by Rembrandt)
Rembrandt *volume 11 page 44*

Niislel Khureheh (capital of Mongolia):
see in index Ulaanbaatar

Nile Delta (region of the Nile Valley in Africa): *see in index* Lower Egypt

Nile River (river in Africa)
MAIN ARTICLE *volume 9 page 72*
MORE TO EXPLORE
ancient Egypt *volume 4 page 112*
facts about Africa *volume 1 page 41*
images
boats near Luxor *picture, volume 9 page 72*
branch in southern Sudan *picture, volume 12 page 200*
Cairo *picture, volume 3 page 9*
Nile River delta *picture, volume 4 page 33*
modern Egypt *volume 4 page 109*

nimbus (art): *see in index* halo

“Niña” (ship)
Columbus *volume 3 page 163*

nine-banded armadillo (mammal) *picture, volume 1 page 183*

9/11 terrorist attacks (U.S. history, 2001): *see in index* September 11 attacks

Nineteenth Amendment (U.S. Constitution) *picture, volume 1 page 94*
Anthony *volume 1 page 140*

“Ninety-five Theses” (work by Luther)
Luther *volume 7 page 186*

Nineveh (ancient city in Iraq)
aqueduct *volume 1 page 156*

ninjutsu (martial art)
martial arts *volume 8 page 64*

Nintendo Company, Ltd. (Japanese company)
electronic games *volume 4 page 122*

“Ninth Symphony” (work by Beethoven)
Beethoven *volume 2 page 48*

Nipmuc (Native American people)
MAIN ARTICLE *volume 9 page 73*
MORE TO EXPLORE
King Philip’s War *volume 7 page 68*
Nipmuc village *picture, volume 9 page 73*

nirvana (Buddhism)
Buddhism *volume 2 page 144*

nitrogen (chemical element)
air *volume 1 page 51*
atmosphere *volume 1 page 223*
legume *volume 7 page 125*

Nix (moon of Pluto)
Pluto *volume 10 page 102*

Nixon, Richard M. (president of the U.S.)
MAIN ARTICLE *volume 9 page 74, picture, volume 9 page 74*
MORE TO EXPLORE
Ford *volume 5 page 51*
timeline *volume 9 page 74*
Vietnam War *volume 14 page 87*

Niza, Marcos de (Spanish priest and explorer)
Arizona *volume 1 page 179*
Zuni *volume 15 page 110*

Nkrumah, Kwame (president of Ghana)
Ghana *volume 5 page 111*

NL (baseball organization): *see in index* National League

no. (abbreviation): *see in index* number

Nobatia (ancient kingdom, Nubia, Africa)
Nubia *volume 9 page 103*

Nobel, Alfred Bernhard (Swedish inventor)
Nobel Prize *volume 9 page 76*

Nobel prize (award)
MAIN ARTICLE *volume 9 page 75*
MORE TO EXPLORE
Wangari Maathai *picture, volume 9 page 76*

noble gas (family of chemical elements)
periodic table *table, volume 3 page 86*

Nofretete (queen of ancient Egypt): *see in index* Nefertiti

Noh drama (Japanese theater)drama *volume 4 page 73*theater *volume 13 page 58***nomad** (wanderer)MAIN ARTICLE *volume 9 page 76*

MORE TO EXPLORE

Gobi *volume 5 page 122*human migration *volume 8 page 126*Mongol Empire *volume 8 page 161*Mongolia *volume 8 page 164*Rom *volume 11 page 82*Sahara *volume 12 page 9*Somalia *volume 12 page 130, picture, volume 9 page 76***nomadism** (society): *see in index* nomad**noncommissioned officer** (military

rank)

army *volume 1 page 189***nonfiction** (literature)fiction *volume 7 page 160***noninfectious disease**animal disease *volume 4 page 56*human disease *volume 4 page 57***nonrenewable resource** (conservation)conservation *volume 3 page 187*fossil fuel *volume 5 page 56*natural resources *volume 9 page 21*petroleum *volume 10 page 68***nonrepresentational art**: *see in index*

abstract art

nonreturning boomerang (weapon and

toy)

boomerang *volume 2 page 110***nonrigid airship** (aircraft): *see in index*

blimp

non-sporting breed (dog group)dog breeds *table, volume 4 page 62***nonstriker** (sports)cricket *volume 3 page 214, picture, volume 3 page 214***nonvascular plant**plant *volume 10 page 95***nonviolence** (social doctrine)Gandhi *volume 5 page 85***Noonan, Fred** (U.S. aviator)Earhart *volume 4 page 88***Nootka** (Native American people)MAIN ARTICLE *volume 9 page 77, picture, volume 9 page 77*

MORE TO EXPLORE

British Columbia *volume 2 page 132***Norden** (region in Europe): *see in index*

Northern Europe

Nordenskiöld, Adolf Erik, Baron

(Swedish explorer)

polar exploration *volume 10 page 110***Nordic skiing** (sport)skiing *volume 12 page 98***Noremburg** (city in Germany): *see in**index* Nuremberg**Noriega, Manuel** (Panamanian dictator)Bush's presidency *volume 2 page 155*Panama *volume 10 page 22***Norman** (people)France *volume 5 page 59*Vikings *volume 14 page 89***Norman Conquest** (British history)MAIN ARTICLE *volume 9 page 78, picture, volume 9 page 78*

MORE TO EXPLORE

Anglo-Saxon *volume 1 page 121*human migration *volume 8 page 127***Normandy** (region in France)Norman Conquest *volume 9 page 78***Normandy Invasion** (European-U.S.

history)

World War II *volume 15 page 69*United States troops *picture, volume 15 page 69***Norseman** (people): *see in index* Viking**Norse mythology** (legends and stories ofNorthern Europe): *see in index* Odin;
Valhalla**North, the** (region in Argentina)Argentina *volume 1 page 175***North, the** (region in the U.S.)American Civil War *volume 1 page 94*Stowe *volume 12 page 195***North America** (continent)MAIN ARTICLE *volume 9 page 79*

MORE TO EXPLORE

dinosaurs

Allosaurus *volume 1 page 86*Apatosaurus *volume 1 page 145*Triceratops *volume 13 page 96*

geography

Alaska *volume 1 page 63, picture, volume 1 page 64*aspens *picture, volume 1 page 210*Central America: *see in index* Central
America

lakes and rivers

Great Lakes *volume 5 page 147*Lake Louise *picture, volume 1 page 69*Lake Ontario and Toronto skyline
*picture, volume 9 page 81*Mississippi and Ohio rivers *picture, volume 9 page 127*Rio Grande *picture, volume 9 page 79*

mountains

Adirondack Mountains *picture, volume 9 page 57, picture, volume 9 page 79*Appalachian Mountains *picture, volume 1 page 151*Bitterroot Mountains *picture, volume 6 page 112*Great Smoky Mountains *picture, volume 9 page 85*Iztaccíhuatl volcano *picture, volume 9 page 82*Rocky Mountains *picture, volume 11 page 79*

history

exploration and colonization of the
Americas *volume 1 page 102*Cabot *volume 3 page 5*De Soto *volume 4 page 41*Native Americans: *see in index* North
American Indian*For more about North America,
look for articles on these countries:*

Antigua and Barbuda	Honduras
Bahamas, The	Jamaica
Barbados	Mexico
Belize	Nicaragua
Canada	Panama
Costa Rica	Saint Kitts and Nevis
Cuba	Saint Lucia
Dominica	Saint Vincent and the Grenadines
Dominican Republic	Trinidad and Tobago
El Salvador	United States
Grenada	
Guatemala	
Haiti	

North American Free Trade Agreement

(international trade)

North America *volume 9 page 83*

trade *volume 13 page 88*

North American Great Basin Indian

(Native American people): *see in index* Great Basin Indian

North American Indian (Native American peoples)

arts: *see in index* Native American arts

Cartier *volume 3 page 49*

conflicts

Black Hawk *volume 2 page 86*

Black Hills *volume 2 page 86*

French and Indian War *volume 5*

page 66

Harrison *volume 6 page 22*

King Philip's War *picture, volume 7*

page 67

fur trade *volume 5 page 76*

Hudson's Bay Company *volume 6*

page 91

National Museum of the American Indian *picture, volume 9 page 16*

Native Americans *volume 9 page 16*

places

Alabama *volume 1 page 60*

Appalachian Mountains *volume 1*

page 151

Arizona *volume 1 page 179*

California *volume 3 page 12*

Canada

Yukon *volume 15 page 97*

Colorado *volume 3 page 157*

Illinois *volume 6 page 118*

Indiana *volume 6 page 127*

Iowa *volume 6 page 146*

Kansas *volume 7 page 48*

Maine *volume 8 page 22*

Maryland *volume 8 page 69*

Michigan *volume 8 page 117*

Missouri *volume 8 page 147*

Montana *volume 8 page 173*

Nebraska *volume 9 page 28*

Nevada *volume 9 page 41*

New Mexico *volume 9 page 52*

North America *volume 9 page 81*

North Carolina *volume 9 page 85*

North Dakota *volume 9 page 87*

Oklahoma *volume 9 page 129*

Oregon *volume 9 page 148*

Pennsylvania *volume 10 page 56*

South Carolina *volume 12 page 147*

South Dakota *volume 12 page 150*

Tennessee *volume 13 page 44*

Texas *volume 13 page 51*

United States *volume 14 page 27, vol-*

ume 14 page 29

Vermont *volume 14 page 69*

Santa Fe Trail *volume 12 page 33*

North American mink (mammal) *picture, volume 8 page 134*

mink *volume 8 page 134*

North American Plateau Indian (Native American people): *see in index* Plateau Indian

North American raccoon (mammal)
raccoon *volume 11 page 14*

North American white pelican (bird)
pelican *volume 10 page 51*

North Arabian Desert (desert in the Middle East): *see in index* Syrian Desert

North Atlantic Ocean (region of the Atlantic Ocean)
Atlantic Ocean *volume 1 page 220*

North Atlantic Treaty Organization (international alliance of countries)

MAIN ARTICLE *volume 9 page 84*

MORE TO EXPLORE

Cold War *volume 3 page 150*

Pakistan *picture, volume 9 page 84*

North Carolina (state in the U.S.)

MAIN ARTICLE *volume 9 page 85*

MORE TO EXPLORE

geography

Cape Hatteras National Seashore *picture, volume 9 page 86*

Great Smoky Mountains *picture, volume 9 page 85*

State Capitol *picture, volume 11 page 25*

North China Plain (plain in China)

Huang He *volume 6 page 89*

North Dakota (state in the U.S.)

MAIN ARTICLE *volume 9 page 87*

MORE TO EXPLORE

geography

Badlands *picture, volume 9 page 88*

farmland *picture, volume 9 page 88*

Northeast Passage (sea route, Eurasia)
polar exploration *volume 10 page 110*

Northern Asia (region in Asia): *see in index* Siberia

Northern Blackfoot (North American people)

Blackfoot *volume 2 page 85*

northern cardinal (bird) *picture, volume 3 page 38*

bill structure and eating habits *picture, volume 2 page 77*

cardinals *volume 3 page 37*

northern copperhead (reptile)

various snakes *picture, volume 12 page 113*

Northern Europe (region in Europe)
Europe *volume 4 page 160*

northern flicker (bird)

bill structure and eating habits *picture, volume 2 page 77*

Northern Hemisphere (geography)

Earth *volume 4 page 90*

equatorial division of Earth *picture, volume 4 page 147*

hemisphere *volume 6 page 37*

season *volume 12 page 61*

Northern Ireland (part of the United Kingdom)

MAIN ARTICLE *volume 9 page 89*

MORE TO EXPLORE

England *volume 4 page 139*

Giant's Causeway *picture, volume 9 page 89*

Ireland *volume 6 page 154*

Ulster *volume 14 page 8*

United Kingdom *volume 14 page 16*

northern lights (atmospheric phenomenon): *see in index* aurora borealis

northern mockingbird (bird): *see in index* common mockingbird

Northern Paiute (Native American people)

Paiute *volume 10 page 12*

Northern Ponca (Native American people)

Ponca *volume 10 page 122*

Northern Rhodesia (country in Africa): *see in index* Zambia

Northern Shoshone (Native American people)

Shoshone *volume 12 page 83*

Northern States (region in the U.S.): *see in index* North, the

Northern Territory (territory in Australia)

MAIN ARTICLE *volume 9 page 90*

MORE TO EXPLORE

Aboriginal artist *picture, volume 9 page 91*

Uluru-Kata Tjuta National Park *picture, volume 1 page 230*

Uluru/Ayers Rock *picture, volume 9 page 91*

Northern Virginia, Army of (U.S. history)

Lee *volume 7 page 122*

North Island (island in New Zealand)

New Zealand *volume 9 page 61*

North Korea: *see in index* Korea, North

North Pole

Arctic Ocean *volume 1 page 173*

important people

Henson *volume 6 page 41*

Peary *volume 10 page 48*

polar exploration *volume 10 page 110*

group led by Peary *picture, volume 10 page 110*

season *volume 12 page 62*

North Sea (sea in the Atlantic Ocean)

MAIN ARTICLE *volume 9 page 92, picture, volume 9 page 93*

North Semitic (writing system)

alphabet *volume 1 page 88*

Northumberland Strait (strait in Canada)

Confederation Bridge *picture, volume 10 page 151*

North Vietnam: *see in index* Vietnam

Northwest Coast Indian (Native American people): *see in index* Haida; Kwakwaka'wakw; Nootka; Tlingit

North West Company (Canadian trading company)

Alberta *volume 1 page 70*

fur trade *volume 5 page 76*

Manitoba *volume 8 page 45*

Northwest Indian Confederation (Native American alliance)

Harrison *volume 6 page 22*

Northwest Passage (sea route around North America)

MAIN ARTICLE *volume 9 page 93*

MORE TO EXPLORE

Amundsen *volume 1 page 113, picture, volume 9 page 94*

exploration and settlement of the

Americas *volume 1 page 103*

polar exploration *volume 10 page 110*

Northwest Territories (territories in Canada)

MAIN ARTICLE *volume 9 page 95*

MORE TO EXPLORE

ice road *picture, volume 9 page 96*

Inuit fisherwoman *picture, volume 9 page 96*

reindeer grazing *picture, volume 13 page 107*

Northwest Territory (historical territory in the U.S.)

Ohio *volume 9 page 126*

North Yemen (historical country in the Middle East): *see in index* Yemen Arab Republic

Norway (country in Europe)

MAIN ARTICLE *volume 9 page 97*

MORE TO EXPLORE

geography

Bergen *picture, volume 9 page 98*

fjord *picture, volume 4 page 162*

history

Greenland *volume 5 page 159*

Iceland *volume 6 page 108*

polar exploration *volume 10 page 110*

Sweden *volume 12 page 213*

Sami traditional dress *picture, volume 9 page 98*

nose (anatomy)

MAIN ARTICLE *volume 9 page 99*

MORE TO EXPLORE

respiratory system *volume 11 page 54*

nostril (anatomy)

nose anatomy *volume 9 page 99*

notation (writing)

writing *volume 15 page 77*

note (sound): *see in index* tone

notebook computer

computers *volume 3 page 172*

No theater (Japanese drama): *see in index* Noh drama

Notre-Dame Cathedral (cathedral in Paris, France): *see in index* Notre-Dame de Paris

Notre-Dame de Chartres (cathedral in Chartres, France): *see in index* Chartres Cathedral

Notre-Dame de Paris (cathedral in Paris, France)

gargoyles *picture, volume 5 page 89*

Paris *volume 10 page 34*

Nouakchott (capital city of Mauritania)

MAIN ARTICLE *volume 9 page 100*

MORE TO EXPLORE

Mauritania *volume 8 page 79*

shop *picture, volume 9 page 100*

Nova Scotia (province in eastern Canada)

MAIN ARTICLE *volume 9 page 101, picture, volume 9 page 102, picture, volume 9 page 102*

novel (literature)

fiction *volume 5 page 18*

novella (literature)

fiction *volume 5 page 18*

Novgorod (historical principality in Russia)

Russia *volume 11 page 106*

NOW (U.S. organization): *see in index* National Organization for Women

Nubia (ancient region in Africa)

MAIN ARTICLE *volume 9 page 103*

MORE TO EXPLORE

Africa *volume 1 page 42*

Kush *volume 7 page 90*

Sudan *volume 12 page 200*

nuclear bomb (military technology)

bomb *volume 2 page 104*

nuclear energy

MAIN ARTICLE *volume 9 page 103*

MORE TO EXPLORE

energy *volume 4 page 138*

power plant cooling towers *picture, volume 9 page 104*

nuclear fission (physics)

nuclear energy *volume 9 page 104*

nuclear fusion (physics)

nuclear energy *volume 9 page 104*

nuclear physics (science)

Curie family *volume 3 page 231*

nuclear power

aircraft carrier *picture, volume 9 page 25*

energy sources *picture, volume 4 page 139*

nuclear-powered submarine (ship)

submarine *volume 12 page 198, picture, volume 12 page 197*

nuclear radiation (physics)
radiation *volume 11 page 17*

nuclear submarine (ship): *see in index*
nuclear-powered submarine

Nuclear Test-Ban Treaty (international treaty, 1963)
Kennedy *volume 7 page 55*

nuclear weapon
Einstein *volume 4 page 116*
nuclear energy *volume 9 page 104*

nucleic acid (chemical substance)
virus *volume 14 page 97, picture, volume 14 page 98*

nucleus (comet's center)
comet *volume 3 page 166*

nucleus (part of living cell)
cell *volume 3 page 66*
animal *picture, volume 3 page 66, picture, volume 9 page 35*
plant *picture, volume 3 page 67*
protozoan *volume 10 page 160*

nucleus (physics): *see in index* atomic nucleus

Nuit (Egyptian goddess): *see in index* Nut

Nuku'alofa (capital city of Tonga)
MAIN ARTICLE *volume 9 page 105*
MORE TO EXPLORE
Royal Palace *picture, volume 9 page 105*
Tonga *volume 13 page 79*

numbat (mammal)
marsupial *picture, volume 8 page 63*

number (mathematics)
MAIN ARTICLE *volume 9 page 105, picture, volume 9 page 106*
MORE TO EXPLORE
common abbreviations *table, volume 1 page 8*

numerator (mathematics)
numbers and number systems *volume 9 page 106*

numero (mathematics): *see in index* number

nun (monasticism)
Jainism *volume 7 page 9*

nunatak (geological formation)
Antarctica *volume 1 page 135*

Nunavut (territory in Canada)
MAIN ARTICLE *volume 9 page 108*

MORE TO EXPLORE

Canada *volume 3 page 26*
Eskimo *volume 4 page 153*
ice fishing *picture, volume 9 page 109*

Nuremberg (city in Germany)
Storm Troopers *picture, volume 9 page 26*

Nuremberg trials (1945-46, history of World War II)
MAIN ARTICLE *volume 9 page 110, picture, volume 9 page 110*

MORE TO EXPLORE

Holocaust *volume 6 page 72*
human rights *volume 6 page 97*
World War II *volume 15 page 71*

Nürnberg (city in Germany): *see in index* Nuremberg

Nürnberg trials (1945-46, Germany): *see in index* Nuremberg trials

nurse (medical profession): *see in index* nursing

nurse midwife (medical profession)
nursing *volume 9 page 111*

nurse practitioner (medical profession)
nursing *volume 9 page 111*

nursery rhyme (literature)
MAIN ARTICLE *volume 9 page 110*
MORE TO EXPLORE
storytelling *volume 12 page 194*

nursing (breast-feeding a baby)
endocrine system *volume 4 page 135*
polar bear cubs *picture, volume 8 page 35*

nursing (medical profession)
MAIN ARTICLE *volume 9 page 111, picture, volume 9 page 111*
MORE TO EXPLORE
Nightingale *volume 9 page 70*

Nut (Egyptian goddess)
Re *volume 11 page 31*

nut (food)
MAIN ARTICLE *volume 9 page 112*
MORE TO EXPLORE
shell *volume 12 page 80*

Nutrasweet (sugar substitute): *see in index* aspartame

nutrient (biochemistry)
food and nutrition *volume 5 page 43*

nutrition

MAIN ARTICLE *volume 5 page 43*

MORE TO EXPLORE

absorption and delivery
liver functions *picture, volume 7 page 167*
lymph and blood vessels *picture, volume 7 page 190*
living thing *volume 7 page 168*
USDA food guide pyramid *picture, volume 5 page 44*

Nuu-chah-nulth (Native American people): *see in index* Nootka

Nuuk (capital city of Greenland)
Greenland *volume 5 page 157*

N.W.A. (U.S. rap group)
rap *volume 11 page 27*

NWSA (U.S. political organization): *see in index* National Woman Suffrage Association

Nyamulagira, Mount (mountain in Democratic Republic of the Congo)
Virunga Mountains *volume 14 page 97*

Nyasa, Lake (lake in Africa)
Malawi shore *picture, volume 8 page 26*

Nyasaland Districts Protectorate (African-British history)
Malawi *volume 8 page 26*

Nyatsimba (African king)
Monomotapa *volume 8 page 169*

Nycticebus (primate): *see in index* slow loris

Nyiragongo, Mount (mountain in Democratic Republic of the Congo)
Virunga Mountains *volume 14 page 97*

nylon (man-made fiber)
clothing *volume 3 page 142*
fibers *volume 5 page 17*

nymph (Greek mythology)
Perseus *volume 10 page 60*



.....
O (chemical element): *see in index* oxygen

O₃: *see in index* ozone

Oahu (island in Hawaii, U.S.)

Hawaii *volume 6 page 27*

oak (tree and shrub)

MAIN ARTICLE *volume 9 page 114*, *picture*, *volume 9 page 114*

oar (watercraft part)

boat types *picture*, *volume 2 page 98*

navy *volume 9 page 26*

OAS (Pan-American organization): *see in index* American States, Organization of

oasis (geological feature)

Ashgabat *volume 1 page 199*

desert *volume 4 page 40*

Sahara *volume 12 page 8*

oat bran

oats *volume 9 page 115*

oat flour

oats *volume 9 page 115*

oats (grain)

MAIN ARTICLE *volume 9 page 114*

MORE TO EXPLORE

oat plants *picture*, *volume 9 page 114*

OAU (intergovernmental organization):

see in index African Unity, Organization of

Oaxaca (state in Mexico)

Zapotec *volume 15 page 103*

Obama, Barack (president of the U.S.)

MAIN ARTICLE *volume 9 page 115*, *picture*, *volume 9 page 115*

MORE TO EXPLORE

timeline *volume 9 page 116*

obelisk (pillar)

Aksum *volume 1 page 59*, *picture*, *volume 1 page 59*

Oberon (moon of Uranus)

Uranus *volume 14 page 39*

objective lens (optical device)

binoculars *volume 2 page 72*, *picture*, *volume 2 page 72*

microscope *volume 8 page 120*

telescope *volume 13 page 38*

oboe (musical instrument)

wind instruments *picture*, *volume 8 page 217*

observatory (astronomy): *see in index* astronomical observatory

observing station: *see in index* weather station

obtuse angle (mathematics)

geometry *volume 5 page 98*

“O Canada” (Canadian national anthem)

national anthem *volume 9 page 13*

occupational safety: *see in index* safety

ocean (Earth feature)

MAIN ARTICLE *volume 9 page 117*

MORE TO EXPLORE

climate *volume 3 page 137*

exploration *volume 4 page 174*

food chain *picture*, *volume 5 page 45*

prehistoric life *volume 10 page 145*

tsunami *volume 13 page 103*, *picture*, *volume 13 page 104*

water *volume 15 page 22*

ocean basin (Earth feature)

ocean *volume 9 page 118*

ocean current

Atlantic Ocean *volume 1 page 221*

ocean *volume 9 page 117*

Pacific Ocean *volume 10 page 4*

ocean floor

ocean *volume 9 page 118*

oceanic island *picture*, *volume 6 page 166*

tube worms *picture*, *volume 9 page 118*

Oceania (region in the Pacific Ocean)

MAIN ARTICLE *volume 9 page 119*

MORE TO EXPLORE

images

dancers in Papua New Guinea *picture*, *volume 9 page 121*

French Polynesian islands *picture*, *volume 9 page 119*

peoples: *see in index* Maori

*For more about Oceania,
look for these articles:*

Australia

Fiji

French

Polynesia

Guam

Kiribati

Marshall Islands

Micronesia,

Federated

States of

Nauru

New Zealand

Palau

Papua New

Guinea

Samoa

Solomon Islands

Tonga

Tuvalu

Vanuatu

oceanic dolphin (mammal): *see in index* true dolphin

oceanic island (geology)

coral atoll *picture*, *volume 6 page 167*

island *volume 6 page 167*, *picture*, *volume 6 page 166*

oceanic ridge (marine geology)

ocean *volume 9 page 118*

oceanic trench (marine geology): *see in index* trench

ocean liner (ship): *see in index* cruise ship

oceanography (science)

bathyscaphe *picture*, *volume 4 page 174*

ocean *volume 9 page 119*

submarine *picture*, *volume 9 page 119*

Oceanside (city in California, U.S.)

California missions *table*, *volume 8 page 140*

ocellated turkey (bird)

turkey *volume 13 page 114*

ocelot (mammal)

MAIN ARTICLE *volume 9 page 122*, *picture*, *volume 9 page 122*

Octavia (wife of Mark Antony)

Cleopatra *volume 3 page 135*

Octavian (Roman emperor): *see in index* Augustus

October Revolution (Russian history)

Russian Revolution *volume 11 page 108*

octopus (mollusk)

MAIN ARTICLE *volume 9 page 123*, *picture*, *volume 9 page 123*

MORE TO EXPLORE

eye *picture*, *volume 4 page 176*

mollusk *volume 8 page 156*

Octopus, The (capital city of Peru): *see in index* Lima

ocular (part of optical instrument): *see in index* eyepiece

Odin (Norse god)

MAIN ARTICLE *volume 9 page 124*, *picture*, *volume 9 page 124*

MORE TO EXPLORE

Valhalla *volume 14 page 51*

Vikings *volume 14 page 89*

Odobenus rosmarus (mammal): *see in index* walrus

Odontoceti (mammal): *see in index*
toothed whale

“Odyssey” (epic poem by Homer)
ancient Greece *volume 5 page 154*
Homer *volume 6 page 76*

Oea (ancient city in Libya): *see in index*
Tripoli

Oedipus (Greek mythology)
sphinx *volume 12 page 163*

offense (sports)
basketball *volume 2 page 34*
football *volume 5 page 49*

officer (military rank)
army *volume 1 page 189*

official language (legal designation)
language *volume 7 page 105*

offset printing
bookmaking *picture, volume 2 page 109*

Oglala (Native American people)
Crazy Horse *volume 3 page 211*

Oglethorpe, James Edward (British military officer)
Georgia *volume 5 page 102*

Ohio (state in the U.S.)
MAIN ARTICLE *volume 9 page 125*
MORE TO EXPLORE

geography
Cleveland lakeshore *picture, volume 9 page 126*
Columbus riverwalk *picture, volume 3 page 162*
farmland *picture, volume 9 page 126*

Ohio River (river in the U.S.)
MAIN ARTICLE *volume 9 page 127*
MORE TO EXPLORE
confluence with Mississippi River *picture, volume 9 page 127*
Mississippi River *volume 8 page 144*
Pittsburgh *picture, volume 10 page 57*

Oía (city in Greece) *picture, volume 5 page 152*

oil (fossil fuel): *see in index* petroleum

oil derrick: *see in index* oil rig

oil gland (anatomy)
skin *volume 12 page 101*

oil gland (bird anatomy): *see in index*
peen gland

oil platform *picture, volume 9 page 93*

oil refinery: *see in index* petroleum refinery

oil rig (petroleum industry)
Caspian Sea *picture, volume 2 page 10*

oil spill
cleanup *picture, volume 10 page 118*

oil well (industry)
Texas *volume 13 page 52*

Ojibwa (Native American people)
MAIN ARTICLE *volume 9 page 127*, *picture, volume 9 page 128*

MORE TO EXPLORE
Algonquian *volume 1 page 80*
Fox *volume 5 page 57*
Manitoba *volume 8 page 44*
Ontario *volume 9 page 140*

Okavango River (river in Africa)
delta *picture, volume 2 page 117*

O’Keeffe, Georgia (U.S. artist)
painting *volume 10 page 11*

Okfenokee Swamp (swamp in the U.S.)
MAIN ARTICLE *volume 9 page 128*
MORE TO EXPLORE
white ibises *picture, volume 14 page 26*

Okinawa, Battle of (Japanese-U.S. history)
World War II *volume 15 page 70*

Oklahoma (state in the U.S.)
MAIN ARTICLE *volume 9 page 129*

MORE TO EXPLORE
Gloss Mountain State Park *picture, volume 9 page 130*
Native Americans
Caddo *volume 3 page 7*
Comanche *volume 3 page 164*, *picture, volume 9 page 130*

Oklahoma City (state capital of Oklahoma, U.S.)
MAIN ARTICLE *volume 9 page 131*

MORE TO EXPLORE
Oklahoma *volume 9 page 129*
Oklahoma City National Memorial *picture, volume 9 page 131*

Oklahoma City bombing (terrorist attack in the U.S.)
Oklahoma *volume 9 page 130*

Oklahoma City National Memorial
(national memorial in Oklahoma City, Oklahoma, U.S.) *picture, volume 9 page 131*

“Oku no hosomichi” (poetic diary by Basho): *see in index* “Narrow Road to the Deep North, The”

Olaf II Haraldsson (king of Norway)
Norway *volume 9 page 98*

Olavinlinna Castle (castle in Finland)
picture, volume 5 page 23

Old Delhi (city in Delhi metropolitan area, India)
Red Fort *picture, volume 4 page 32*

Old English language
England *volume 4 page 140*

Old English sheepdog (breed of dog)
herding dogs *table, volume 4 page 62*

Old Glory (U.S. flag): *see in index* Stars and Stripes

Old Hickory (president of the U.S.): *see in index* Jackson, Andrew

“Old Ironsides” (ship): *see in index* “Constitution”

Old Kingdom (Egyptian history)
ancient Egypt *volume 4 page 114*

Old Line State (state in the U.S.): *see in index* Maryland

old-man’s beard (lichen) *picture, volume 7 page 146*

Old Osawatimie Brown (U.S. abolitionist): *see in index* Brown, John

“Old Rough and Ready” (president of the U.S.): *see in index* Taylor, Zachary

Old Stone Age (anthropology): *see in index* Paleolithic Period

Old Style calendar: *see in index* Julian calendar

Old Testament (biblical text)
Bible *volume 2 page 67*
Christianity *volume 3 page 112*

Old Town (district in Stockholm, Sweden): *see in index* Gamla Stan

Old Town (district in Edinburgh, Scotland, United Kingdom)
Edinburgh *volume 4 page 104*

Old World blackbird (bird)blackbird *volume 2 page 84***Old World monkey** (primate) *picture,**volume 8 page 167*monkey *volume 8 page 167***Old World sparrow** (bird)sparrow *volume 12 page 159***Old World vulture** (bird)vulture *volume 14 page 106***Olea europaea** (tree): *see in index* olive**Ole Miss** (university in Oxford, Mississippi, U.S.): *see in index* Mississippi, University of**olfaction** (sense): *see in index* smell**olfactory sense** (sense): *see in index* smell**olive** (tree and fruit)MAIN ARTICLE *volume 9 page 131, picture, volume 9 page 132***olive baboon** (primate): *see in index* anubis baboon**“Oliver Twist”** (work by Dickens)Dickens *volume 4 page 45***Olmec** (Native American people)MAIN ARTICLE *volume 9 page 132*

MORE TO EXPLORE

Mexico *volume 8 page 111*North America *volume 9 page 82*Olmec rock sculpture *picture, volume 9 page 132***Olympia** (state capital of Washington, U.S.)MAIN ARTICLE *volume 9 page 133***Olympic Games**MAIN ARTICLE *volume 9 page 133*

MORE TO EXPLORE

ancient Greece *volume 5 page 155*horse *volume 6 page 87*

images

African American silent protest in 1968 *picture, volume 1 page 44*

closing ceremony at 2006 Winter

Games *picture, volume 9 page 134*cycling *picture, volume 3 page 234*footrace event *picture, volume 9**page 134*Owens in 1936 Olympic Games *picture, volume 9 page 159*marathon *volume 8 page 53*Owens *volume 9 page 159*Rudolph *volume 11 page 100*soccer *volume 12 page 119*sports *volume 12 page 168*Thorpe *volume 13 page 61*track and field *volume 13 page 84*volleyball *volume 14 page 104*Winter Olympics: *see in index* Winter Olympicswrestling *volume 15 page 73***Olympus, Mount** (mountain in Greece)MAIN ARTICLE *volume 9 page 135*

MORE TO EXPLORE

Greece *volume 5 page 151***Omaha** (Native American people)MAIN ARTICLE *volume 9 page 135*

MORE TO EXPLORE

Omaha traditional clothing *picture, volume 9 page 135*Osage *volume 9 page 152***Oman** (country in the Middle East)MAIN ARTICLE *volume 9 page 136, picture, volume 9 page 136*

MORE TO EXPLORE

Muscat *picture, volume 8 page 206***Omayyad Caliphate** (Islamic history): *see in index* Umayyad Caliphate**Omdurman** (city in The Sudan)Khartoum *volume 7 page 61***omnivore** (biology)mammal *volume 8 page 37***on-deck circle** (part of baseball field)baseball field *picture, volume 2 page 31***Oneida** (Native American people)MAIN ARTICLE *volume 9 page 137*

MORE TO EXPLORE

Hiawatha *volume 6 page 49*Iroquois *volume 6 page 160*Oneida baskets *picture, volume 9 page 137***O'Neill, Eugene** (U.S. playwright)drama *volume 4 page 74***one-party system** (politics)political party *volume 10 page 114***onion** (plant and food)MAIN ARTICLE *volume 9 page 137, picture, volume 9 page 138*

MORE TO EXPLORE

garlic *volume 5 page 90***Onondaga** (Native American people)MAIN ARTICLE *volume 9 page 138*

MORE TO EXPLORE

Fort Onondaga *picture, volume 9 page 138*Hiawatha *volume 6 page 49*Iroquois *volume 6 page 160***Ontario** (province in Canada)MAIN ARTICLE *volume 9 page 139, picture, volume 9 page 140*

MORE TO EXPLORE

Lake Ontario *volume 9 page 141***Ontario, Lake** (lake in North America)MAIN ARTICLE *volume 9 page 141*

MORE TO EXPLORE

beach and inlet *picture, volume 9 page 141*Great Lakes *volume 5 page 147*Toronto *picture, volume 9 page 81***“On the Origin of Species by Means of Natural Selection”** (work by Darwin)Darwin *volume 4 page 17*evolution *volume 4 page 171***Oort Cloud** (astronomy)solar system *volume 12 page 128, picture, volume 12 page 127***OPEC** (multinational organization)MAIN ARTICLE *volume 9 page 150, picture, volume 9 page 150***open-pit mine** (mining) *picture, volume 8 page 133***open prison:** *see in index* minimum-security prison**open-range zoo**zoo *volume 15 page 108***open stage** (theater): *see in index* thrust stage**opera** (performing art)MAIN ARTICLE *volume 9 page 141*

MORE TO EXPLORE

“The Barber of Seville” *picture, volume 9 page 142***operating room** (physiology) *picture, volume 12 page 207***operating system** (computing)
computer *volume 3 page 173***operation** (medical procedure): *see in index* surgery**Operation Desert Shield** (U.S. military operation): *see in index* Desert Shield, Operation

Operation PUSH (U.S. organization):
see in index PUSH, Operation

opinion (law)

United States government *volume 14*
page 36

Opium Wars (Chinese history)

China *volume 3* *page 103*

Opoku Ware (African ruler)

Ashanti *volume 1* *page 197*

opossum (marsupial)

MAIN ARTICLE *volume 9* *page 142*, *picture*,
volume 9 *page 142*

MORE TO EXPLORE

marsupial *volume 8* *page 63*

young opossum *picture*, *volume 13*
page 6

Opportunity (Mars rover) *picture*, *vol-*
ume 12 *page 152*

Mars *volume 8* *page 60*

opposable thumb (anatomy)

hand *volume 6* *page 12*

optical fiber (technology) *picture*, *vol-*
ume 5 *page 15*

fiber optics *volume 5* *page 15*, *picture*,
volume 5 *page 15*

optical illusion

mirage *picture*, *volume 8* *page 138*

refraction *picture*, *volume 9* *page 143*

optical microscope (scientific instru-
ment)

microscope *volume 8* *page 120*

optic nerve (anatomy of the eye)

eye *picture*, *volume 4* *page 175*

optics (science)

MAIN ARTICLE *volume 9* *page 143*

oracle (religion)

Delphi *volume 4* *page 32*

oral cavity (anatomy): *see in index* mouth

oral literature

literature *volume 7* *page 160*

oral tradition

mythology *volume 8* *page 222*

storytelling *volume 12* *page 193*

orange (tree and fruit)

MAIN ARTICLE *volume 9* *page 143*

MORE TO EXPLORE

citrus fruits *volume 3* *page 123*

fruit *picture*, *volume 5* *page 72*

navel orange *picture*, *volume 9* *page 144*

Orange Free State (historical indepen-
dent state and province in South Africa)
South Africa *volume 12* *page 138*

orangutan (primate)

MAIN ARTICLE *volume 9* *page 144*, *picture*,
volume 9 *page 144*

MORE TO EXPLORE

apes *volume 1* *page 146*, *picture*, *vol-*
ume 1 *page 147*, *picture*, *volume 1*
page 148

Orava Castle (castle in Slovakia) *picture*,
volume 12 *page 109*

orbit (astronomy)

comet *volume 3* *page 166*

Moon *volume 8* *page 178*

planets and dwarf planets *volume 10*
page 93, *picture*, *volume 10* *page 93*

Earth *volume 4* *page 90*

Jupiter *volume 7* *page 41*

Mars *volume 8* *page 59*

Mercury *volume 8* *page 102*

Neptune *volume 9* *page 33*

Pluto *volume 10* *page 101*

Saturn *volume 12* *page 42*

Uranus *volume 14* *page 39*

Venus *volume 14* *page 66*

orca (whale): *see in index* killer whale

orchestra (music)

MAIN ARTICLE *volume 9* *page 145*

MORE TO EXPLORE

classical music *volume 3* *page 132*

musical instruments *volume 8*
page 215

seating chart by instrument *picture*,
volume 9 *page 145*

orchid (plant and flower)

MAIN ARTICLE *volume 9* *page 146*

MORE TO EXPLORE

fly orchid mimicry *picture*, *volume 8*
page 130

moth orchid *picture*, *volume 9* *page 146*

vanilla *volume 14* *page 57*

orders of knighthood

knight *volume 7* *page 74*

ordinary (bicycle) *picture*, *volume 2*
page 69

ore (mineral)

metal *volume 8* *page 106*, *picture*, *vol-*
ume 8 *page 106*

Oregon (state in the U.S.)

MAIN ARTICLE *volume 9* *page 147*

MORE TO EXPLORE

geography

Elowah Falls *picture*, *volume 9*
page 147

Portland *picture*, *volume 9* *page 148*

State Capitol *picture*, *volume 12*
page 20

Polk *volume 10* *page 116*

Oregon Trail (historic route in the U.S.)

MAIN ARTICLE *volume 9* *page 149*

MORE TO EXPLORE

Idaho *volume 6* *page 112*

Oregon *volume 9* *page 148*

pioneer life *volume 10* *page 88*

Salem *volume 12* *page 20*

organelle (part of cell)

animal cell *picture*, *volume 3* *page 66*

plant cell *picture*, *volume 3* *page 67*

organic material (chemical compound)

soil *volume 12* *page 124*

organism: *see in index* living thing

Organization of: *see in index* under the
specific part of the name, for example,
African Unity, Organization of except as
found below

Organization of the Petroleum Export-
ing Countries (multinational organiza-
tion): *see in index* OPEC

organized crime

crime *volume 3* *page 216*

organized labor

Chavez *volume 3* *page 84*

Industrial Revolution *volume 6*
page 134

labor *volume 7* *page 97*

organ transplant (surgery): *see in index*
transplant

oriental coral snake (reptile)

various snakes *picture*, *volume 12*
page 113

Oriental fire-bellied toad (amphibian)
picture, *volume 13* *page 73*

Oriental giant squirrel (rodent): *see in*
index giant squirrel of Asia

Oriental rug (floor covering)

rug and carpet *volume 11* *page 102*

origami (art)

Peace Memorial Park *picture*, *volume 6*
page 60

Orion (Greek mythology)

Artemis *volume 1* *page 191*

Orion (constellation) *picture*, *volume 3*

page 188

Orizaba (volcano in Mexico): *see in index*

Citlaltépetl

Orlando (city in Florida, U.S.)

Florida *volume 5* *page 35*

Ornithischia (dinosaur order)

dinosaur *volume 4* *page 51*, *picture*, *volume 4* *page 50*

Ornithomimus (dinosaur genus)

dinosaurs in scale *picture*, *volume 4*
page 53

Orozco, José Clemente (Mexican

painter)

painting *picture*, *volume 10*
page 11

Orpheus (Greek mythology)

MAIN ARTICLE *volume 9* *page 151*, *picture*,
volume 9 *page 151*

orthodontics (dentistry)

dentistry *volume 4* *page 38*

orthodontist: *see in index* orthodontics**Orthodox Judaism**

Judaism *volume 7* *page 38*

OS (computing): *see in index* operating system**Osage** (Native American people)

MAIN ARTICLE *volume 9* *page 152*

MORE TO EXPLORE

Peter Bigheart, Osage chief *picture*, *volume 9* *page 152*
Wichita *volume 15* *page 44*

Osceola (Seminole leader)

MAIN ARTICLE *volume 9* *page 152*, *picture*,
volume 9 *page 153*

Osei Tutu (ruler of the Ashanti kingdom)

Ashanti *volume 1* *page 197*

Osiris (Egyptian god)

MAIN ARTICLE *volume 6* *page 162*, *picture*,
volume 6 *page 163*

MORE TO EXPLORE

ancient Egypt *volume 4* *page 113*

Öskjuvatn, Lake (lake in Iceland) *picture*, *volume 6* *page 108***Oslo** (capital city of Norway)

MAIN ARTICLE *volume 9* *page 153*

MORE TO EXPLORE

Norway *volume 9* *page 97*

Osman I (Ottoman sultan)

Ottoman Empire *volume 9* *page 156*

Ossa, Mount (mountain in Tasmania, Australia)

Tasmania *volume 13* *page 19*

Ostend Manifesto (U.S. history)

Buchanan *volume 2* *page 139*

ostrich (bird)

MAIN ARTICLE *volume 9* *page 154*, *picture*,
volume 9 *page 154*

MORE TO EXPLORE

bird *volume 2* *page 76*

flightless birds *volume 2*
page 79

Oswald, Lee Harvey (U.S. assassin)

Kennedy *volume 7* *page 55*

Oto (Native American people)

MAIN ARTICLE *volume 9* *page 154*

MORE TO EXPLORE

Missouri people *volume 8* *page 145*

Otoe-Missouria Tribe of Oklahoma

(Native American people)

Missouri people *volume 8* *page 145*

Oto *volume 9* *page 155*

Ottawa (Native American people)

Pontiac *volume 10* *page 123*

Ottawa (capital city of Canada)

MAIN ARTICLE *volume 9* *page 155*

MORE TO EXPLORE

Canada *volume 3* *page 23*

Canada Day *volume 3* *page 27*

Ontario *volume 9* *page 139*

otter (mammal)

MAIN ARTICLE *volume 9* *page 155*, *picture*,
volume 9 *page 156*

Otto III (Holy Roman emperor)

Holy Roman Empire *volume 6* *page 75*

Otto, Nikolaus (German engineer)

automobile history *volume 1* *page 237*

internal-combustion engine *volume 6*
page 141

technology and invention *volume 13*
page 27

Ottoman Empire (historic empire in Eurasia)

MAIN ARTICLE *volume 9* *page 156*

MORE TO EXPLORE

geography

Africa

Tripoli *volume 13* *page 98*

Tunisia *volume 13* *page 110*

Armenia *volume 1* *page 185*

Balkan Peninsula *volume 2* *page 12*

Albania *volume 1* *page 66*

Belgrade *volume 2* *page 56*

Bosnia and Herzegovina *volume 2*

page 113, *volume 12* *page 37*

Bulgaria *volume 2* *page 148*

Greece *volume 1* *page 219*, *volume 5*
page 152

Macedonia *volume 8* *page 5*

Montenegro *volume 8* *page 175*

Tiranë *volume 13* *page 69*

Middle East *volume 8* *page 124*

Arabian Peninsula *volume 1*
page 157

Cyprus *volume 3* *page 237*

Egypt *volume 4* *page 110*

Iraq *volume 6* *page 152*

Jordan *volume 7* *page 34*

Lebanon *volume 7* *page 121*

Saudi Arabia *volume 12* *page 44*

Turkey *volume 13* *page 112*

Yemen *volume 15* *page 91*

history

Byzantine Empire *volume 2* *page 159*

Islam *volume 6* *page 165*

Istanbul *volume 6* *page 171*

World War I *volume 15* *page 63*

Yugoslavia *volume 15* *page 95*

Ouagadougou (capital city of Burkina Faso)

MAIN ARTICLE *volume 9* *page 157*

MORE TO EXPLORE

Burkina Faso *volume 2* *page 151*

ounce (unit of measure)

common abbreviations *table*, *volume 1*
page 8

measurement *volume 8* *page 90*

Our Lady of Peace, Basilica of (church in Yamoussoukro, Côte d'Ivoire) *picture*, *volume 15* *page 85***out** (sports)

softball *volume 12* *page 123*

Outback (region in Australia)

Australia *volume 1* *page 229*

outboard motorboat (watercraft)boat *volume 2 page 98***outer ear** (anatomy)ear *volume 4 page 87, picture, volume 4 page 87***Outer Mongolia** (country in Asia): *see in index* Mongolia**outer space:** *see in index* space**outfield** (sports)baseball *volume 2 page 30, picture, volume 2 page 31*
softball *volume 12 page 122***“Outsiders, The”** (work by Hinton)Hinton *volume 6 page 58***ova** (animal reproductive cells): *see in index* ovum**Oval Office** (office in the White House, Washington, D.C.) *picture, volume 14 page 34***Ovambo** (people)Namibia *volume 9 page 6***ovaries** (animal and human): *see in index* ovary**ovary** (animal and human)endocrine system *volume 4 page 136, picture, volume 4 page 135*
reproductive system *volume 11 page 48*
human reproductive system *picture, volume 11 page 47, picture, volume 11 page 48***overseas trade:** *see in index* international trade**oviduct** (anatomy): *see in index* fallopian tube**Oviraptor** (dinosaur)MAIN ARTICLE *volume 9 page 158, picture, volume 9 page 158*

MORE TO EXPLORE

dinosaurs in scale *picture, volume 4 page 53***ovulation** (physiology)reproductive system *volume 11 page 48***ovule** (botany)parts of a flower *picture, volume 5 page 38***ovum** (animal reproductive cell)egg *volume 4 page 108***Owens, Jesse** (U.S. athlete)MAIN ARTICLE *volume 9 page 159, picture, volume 9 page 159***owl** (bird)MAIN ARTICLE *volume 9 page 159, picture, volume 9 page 159*

MORE TO EXPLORE

birds of prey *volume 2 page 80***owl monkey** (primate): *see in index* night monkey**ox** (mammal)rice planting work *picture, volume 1 page 48***oxeye daisy** (flowering plant)daisy *volume 4 page 6***oxygen** (chemical element)air *volume 1 page 51*
algae *volume 1 page 76*
anatomy and physiology
blood *volume 2 page 92, picture, volume 3 page 40*
cardiovascular system *picture, volume 3 page 39*
respiratory system *volume 11 page 54*
lung *volume 7 page 184*
atmosphere *volume 1 page 223*
combustion *volume 3 page 165*
fire *volume 5 page 25*
firefighting *volume 5 page 25*
living thing *volume 7 page 168*
ozone *volume 9 page 160*
photosynthesis *volume 10 page 78*
forest *volume 5 page 54*
plankton *volume 10 page 94*
plant *volume 10 page 96*
water molecule *picture, volume 8 page 155***oxygen cycle**air *volume 1 page 51*
photosynthesis *picture, volume 10 page 78***oyster** (mollusk)jewelry and gems *volume 7 page 24*
mollusk *volume 8 page 156*
shell *volume 12 page 80***oz.** (unit of measure): *see in index* ounce**Ozark Mountains** (mountain range in the U.S.)waterfall *picture, volume 1 page 180***ozone** (chemistry)MAIN ARTICLE *volume 9 page 160*

MORE TO EXPLORE

atmosphere *volume 1 page 223*
ozone hole *picture, volume 9 page 160***ozone hole** (atmospheric phenomenon)Antarctic ozone hole *picture, volume 9 page 160***ozone layer** (atmospheric region)atmosphere *volume 1 page 223*
ozone *volume 9 page 160, picture, volume 9 page 160*
pollution *volume 10 page 118***PA** (Palestinian government): *see in index* Palestinian Authority**Pachomius, Saint** (Egyptian monk)monk *volume 8 page 166***Pachycephalosaurus** (dinosaur)dinosaurs in scale *picture, volume 4 page 53***Pacific, War of the** (South American history, 1879-83)Bolivia *volume 2 page 103*
Peru *volume 10 page 65***Pacific Ocean**MAIN ARTICLE *volume 10 page 4*

MORE TO EXPLORE

exploration

Balboa *volume 2 page 11*
Cook *volume 3 page 193*
Drake *volume 4 page 70*
Magellan *volume 8 page 15*

geography and geology

coral island *picture, volume 10 page 4*
ocean *volume 9 page 117*
oceanic island *picture, volume 6 page 166*
Panama City *picture, volume 10 page 24*
Ring of Fire *volume 11 page 66*
volcano *volume 14 page 100*
trans-Pacific container ship *picture, volume 10 page 5***Pacific Plate** (geology)Pacific Ocean *volume 10 page 4*

plate tectonics *volume 10 page 98*
 Ring of Fire *volume 11 page 66*

Pacific salmon (fish)
 salmon *volume 12 page 22*

pacifism (political philosophy)
 peace movements *volume 10 page 44*

pack (animal behavior)
 dog *volume 4 page 61*
 jackal *volume 7 page 4*

pack ice (ice formation)
 Arctic Ocean *volume 1 page 173*

paddy (agriculture)
 images
 Cambodia *picture, volume 3 page 18*
 India *picture, volume 11 page 63*
 Japan *picture, volume 7 page 135*
 rice *volume 11 page 63*

Paekche (ancient kingdom in Korea)
 North Korea *volume 7 page 80*
 South Korea *volume 7 page 83*

Paektu, Mount (mountain in North Korea) *picture, volume 7 page 81*
 North Korea *volume 7 page 79*

Pagan (city in Myanmar)
 Buddhist temples *picture, volume 8 page 221*

page (rank)
 knight *volume 7 page 74*

pagoda (tower)
 architecture *volume 1 page 169*
 images
 Hanoi *picture, volume 6 page 13*
 Kyoto *picture, volume 7 page 12*
 Sule Pagoda *picture, volume 15 page 86*

Pa-Hay-Okee (region in Florida, U.S.):
see in index Everglades

Pahlavi, Mohammad Reza Shah (shah of Iran): *see in index* Mohammad Reza Shah Pahlavi

Pahlavi, Reza Shah (shah of Iran): *see in index* Reza Shah Pahlavi

Pahlavi Dynasty (Iranian dynasty)
 Iran *volume 6 page 149*

Paiea (king of Hawaii): *see in index* Kamehameha I

Paige, Satchel (U.S. baseball player)
 MAIN ARTICLE *volume 10 page 5, picture, volume 10 page 6*
 MORE TO EXPLORE
 Bell *volume 2 page 59*

Paine, Thomas (British-U.S. author)
 MAIN ARTICLE *volume 10 page 6*
 MORE TO EXPLORE
 Declaration of Independence *volume 4 page 24*

painter (art): *see in index* painting

painting (art)
 MAIN ARTICLE *volume 10 page 7*
 MORE TO EXPLORE
 20th century
 “Painting” by Miro *picture, volume 10 page 12*
 “Zapatistas” by Orozco *picture, volume 10 page 11*
 ancient and prehistoric
 cave painting *picture, volume 10 page 8*
 Greek vase painting *picture, volume 12 page 160*
 Chinese scroll paintings *picture, volume 10 page 9*
 “Napoleon in His Study” by David *picture, volume 9 page 8*
 “Pan American Unity” by Rivera *picture, volume 11 page 68*
 Persian illuminated manuscript *picture, volume 10 page 8*
 Renaissance
 “A Woman at Her Toilet” by Titian *picture, volume 10 page 9*
 detail of “School of Athens” by Raphael *picture, volume 10 page 73*
 “The Last Supper” by Leonardo da Vinci *picture, volume 7 page 132*
 Rubens’ depiction of Marie de Médicis *picture, volume 8 page 91*
 “The Wheelbarrow, Orchard” by Pissarro *picture, volume 10 page 10*

For more about painting, look for articles on these painters:

Greco, El	Picasso, Pablo
Kahlo, Frida	Rembrandt
Leonardo da Vinci	Rivera, Diego
Michelangelo	Van Gogh, Vincent
Monet, Claude	Warhol, Andy

“Painting” (painting by Miró) *picture, volume 10 page 12*

Paiute (Native American people)
 MAIN ARTICLE *volume 10 page 12*
 MORE TO EXPLORE
 Paiute basket weaver *picture, volume 10 page 12*
 Winnemucca *volume 15 page 51*

Pakistan (country in Asia)
 MAIN ARTICLE *volume 10 page 13*
 MORE TO EXPLORE
 geography
 Asia *volume 1 page 200*
 tombs *picture, volume 10 page 14*
 history
 Bangladesh *volume 2 page 22*
 India *volume 6 page 125*
 refugee *volume 11 page 41*
 timeline *volume 10 page 13*
 people and culture
 cotton field *picture, volume 10 page 14*
 NATO earthquake relief efforts *picture, volume 9 page 84*
 Ramadan meal preparation *picture, volume 11 page 26*

palace (architecture)
 tsar’s palace in Saint Petersburg *picture, volume 11 page 108*
 Westminster *picture, volume 13 page 56*

Palace of: *see in index under the specific part of the name, for example* Westminster, Palace of

Paleolithic Period (anthropology): *see in index* Paleolithic Period

Paleozoic Era (prehistoric times): *see in index* Paleozoic era

Palau (island country in the Pacific Ocean)
 MAIN ARTICLE *volume 10 page 16*
 MORE TO EXPLORE

islands *picture, volume 10 page 16*

Palazzo Ducale (palace in Venice, Italy): *see in index* Doges’ Palace

pale laurel (shrub)
 laurel *volume 7 page 116*

Paleo-Christian art: *see in index* Early Christian art

Paleolithic Period (anthropology)
 Stone Age *volume 12 page 188*

paleontologist

geology *volume 5 page 97*
paleontology *volume 10 page 17*

paleontology (science)

MAIN ARTICLE *volume 10 page 17, picture, volume 10 page 17*

MORE TO EXPLORE

human origins *volume 6 page 94*

Paleozoic era (prehistoric time period)

geology *volume 5 page 97*
prehistoric life *volume 10 page 144, table, volume 10 page 145*

Palestine (region in the Middle East)

MAIN ARTICLE *volume 10 page 17*

MORE TO EXPLORE

Arab-Israeli Wars *volume 1 page 158*
Israel *volume 6 page 169*
Judaism *volume 7 page 38*
Tel Aviv-Yafo *volume 13 page 34, picture, volume 13 page 33*
Jerusalem *volume 7 page 21*
Jordan *volume 7 page 34*
Middle East *volume 8 page 124*
Palestine Liberation Organization *volume 10 page 19*
refugee *volume 11 page 41*
World War I *volume 15 page 63*

Palestine Liberation Organization (Palestinian political organization)

MAIN ARTICLE *volume 10 page 19*

MORE TO EXPLORE

Arab-Israeli Wars *volume 1 page 159*
Israel *volume 6 page 170*
Lebanon *volume 7 page 121*
Palestine *volume 10 page 19*
signing peace agreement *picture, volume 10 page 19*

Palestinian (people)

Bethlehem *volume 2 page 64*
Israel *volume 6 page 168*
Palestine Liberation Organization *volume 10 page 19*

Palestinian Authority (Palestinian government)

Palestine Liberation Organization *volume 10 page 20*

Palikir (capital city of the Federated States of Micronesia)

MAIN ARTICLE *volume 10 page 20*

MORE TO EXPLORE

Federated States of Micronesia *volume 8 page 119*

Pali language

Buddhism *volume 2 page 145*

palm (tree, shrub, or vine)

MAIN ARTICLE *volume 10 page 20, picture, volume 10 page 20*

MORE TO EXPLORE

Panamanian beach *picture, volume 10 page 22*

Palmer, Arnold (U.S. golfer)

golf *volume 5 page 126*

Palmerston (capital city of Northern Territory, Australia): *see in index* Darwin**Palm Sunday** (Christianity)

Easter *volume 4 page 93*
Minsk *picture, volume 8 page 137*

palsy (medical disorder): *see in index* paralysis**Pamir Mountains** (mountain range in Central Asia)

snow-covered peaks in Tajikistan *picture, volume 13 page 10*

Pampas, the (region in Argentina)

Argentina *volume 1 page 175*
grassland *volume 5 page 143*

Pan (Greek god)

Midas *volume 8 page 122*

Panama (country in Central America)

MAIN ARTICLE *volume 10 page 21*

MORE TO EXPLORE

geography
beach *picture, volume 10 page 22*
Panama City *picture, volume 10 page 24*
history
Bolivar *volume 2 page 101*
Bush *volume 2 page 155*

Panama Canal (canal in Central America)

MAIN ARTICLE *volume 10 page 23*

MORE TO EXPLORE

canal *volume 3 page 28*
Panama *volume 10 page 21*
Panama City *volume 10 page 23*
Pedro Miguel Locks *picture, volume 10 page 23*
Roosevelt *volume 11 page 95*
transportation *volume 13 page 93*

Panama Canal Zone (region in Panama): *see in index* Canal Zone**Panama City** (capital city of Panama)

MAIN ARTICLE *volume 10 page 23, picture, volume 10 page 24*

MORE TO EXPLORE

Panama *volume 10 page 21*

“Pan American Unity” (mural by Rivera) *picture, volume 11 page 68***pancreas** (anatomy)

MAIN ARTICLE *volume 10 page 24, picture, volume 10 page 24*

MORE TO EXPLORE

digestive system *volume 4 page 48*
frog *picture, volume 4 page 48*
human *picture, volume 4 page 47*
endocrine system *volume 4 page 136, picture, volume 4 page 135*

panda (mammal)

MAIN ARTICLE *volume 10 page 25, picture, volume 10 page 25*

pandemic (disease outbreak)

epidemic *volume 4 page 146*

Pandora (Greek mythology)

MAIN ARTICLE *volume 10 page 26, picture, volume 10 page 26*

MORE TO EXPLORE

mythology *volume 8 page 223*
Prometheus *volume 10 page 156*

Pandora's box (Greek mythology)

Pandora *volume 10 page 27*

Pangaea (supercontinent)

continent *volume 3 page 190*
plate tectonics *volume 10 page 98*

panning (mining method)

miners in Alaska *picture, volume 5 page 124*

Pantanal (freshwater wetland in Brazil)

picture, volume 2 page 126
Brazil *volume 2 page 125*

Panth (Sikhism): *see in index* Khalsa**panther** (mammal): *see in index* leopard; puma**panther chameleon** (reptile) *picture, volume 3 page 80***papacy** (Roman Catholicism): *see in index* pope**Papago** (Native American people): *see in index* Tohono O'odham

Papal States (historic region in Italy)
Vatican City *volume 14 page 59*

papaya (tree and fruit)
MAIN ARTICLE *volume 10 page 27, picture, volume 10 page 27*

Papeete (capital city of French Polynesia)
French Polynesia *volume 5 page 68*

paper
MAIN ARTICLE *volume 10 page 27, picture, volume 10 page 28, picture, volume 10 page 28*

MORE TO EXPLORE

book and bookmaking *volume 2 page 109*
fibers *volume 5 page 16*
money *volume 8 page 161*

paperboard (grade of paper): *see in index* cardboard

paper folding (art): *see in index* origami

paper mill
mill machinery *picture, volume 10 page 28*

paper wasp (insect)
nest *volume 9 page 37, picture, volume 9 page 37*

papilla (anatomy)
tongue *volume 13 page 80*

paprika (spice)
pepper *volume 10 page 59*

Papuan (people)
Papua New Guinea *volume 10 page 29*

Papua New Guinea (island country in the Pacific Ocean)

MAIN ARTICLE *volume 10 page 29*

MORE TO EXPLORE

dancers *picture, volume 9 page 121, picture, volume 10 page 29*
Oceania *volume 9 page 121*
Port Moresby *picture, volume 10 page 131*

papyrus (writing material)
book and bookmaking *volume 2 page 109*

par (golf)
golf *volume 5 page 126*

Paraclete (Christianity): *see in index* Holy Spirit

parade
images
Chinese New Year *picture, volume 3 page 105*
Independence Day in Atlanta *picture, volume 6 page 122*
Labor Day *picture, volume 7 page 99*
Mardi Gras *picture, volume 8 page 54*
parade balloon *picture, volume 2 page 15*
Port-au-Prince *picture, volume 10 page 130*
Saint Patrick's Day *volume 12 page 15*

Paraguay (country in South America)
MAIN ARTICLE *volume 10 page 30, picture, volume 10 page 31, picture, volume 10 page 31*

MORE TO EXPLORE

presidential palace *picture, volume 1 page 216*

parakeet (bird) *picture, volume 2 page 76*

parallel (geography): *see in index* parallels

parallel bars (gymnastics)
gymnastics *volume 5 page 174, picture, volume 5 page 175*

parallels (geography)
equator *volume 4 page 147*

paralysis (medical disorder)
nervous system *volume 9 page 36*

Paramaribo (capital city of Suriname)
MAIN ARTICLE *volume 10 page 32, picture, volume 10 page 32*

MORE TO EXPLORE

Suriname *volume 12 page 208, picture, volume 12 page 208*

Paraná River (river in South America)
Itaipú Dam *picture, volume 10 page 31*
Paraguay *volume 10 page 30*

Parasaurolophus (dinosaur genus)
dinosaurs in scale *picture, volume 4 page 53*

parasite (organism)
MAIN ARTICLE *volume 10 page 32*
MORE TO EXPLORE
drug *volume 4 page 78*
fungus *volume 5 page 75*
insect *volume 6 page 139*
lamprey *volume 7 page 103, picture, volume 7 page 103*
mistletoe *picture, volume 10 page 33*
protozoan *volume 10 page 159*

parasitism (biology)
symbiosis *volume 12 page 222*

parathyroid gland (anatomy)
endocrine system *volume 4 page 135, picture, volume 4 page 135*

Paris (capital city of France)
MAIN ARTICLE *volume 10 page 33*

MORE TO EXPLORE

Bastille Day parade *picture, volume 2 page 38*
Eiffel Tower *volume 4 page 115, picture, volume 4 page 115*
France *volume 5 page 58*
Notre Dame Cathedral *picture, volume 5 page 89*

Paris, Peace of (1783): *see in index* Paris, Treaty of

Paris, Treaty of (1763)
French and Indian War *volume 5 page 67*

Paris, Treaty of (1783)
Adams *volume 1 page 23*
American Revolution *volume 1 page 102*

Paris, Treaty of (1898)
Spanish-American War *volume 12 page 157*

Parisii (people)
Paris *volume 10 page 34*

park
New York City *picture, volume 9 page 59*

Parker, Catherine Langloh (Australian writer): *see in index* Parker, K. Langloh

Parker, Charlie (U.S. musician)
jazz *volume 7 page 16*

Parker, K. Langloh (Australian writer)
literature for children *volume 7 page 164*

Parker, Quannah (Comanche chief) *picture, volume 3 page 164*

Parkinson, James (British doctor)
Parkinson's disease *volume 10 page 35*

Parkinson's disease
MAIN ARTICLE *volume 10 page 35, picture, volume 10 page 35*

Parks, Rosa (U.S. civil rights activist)

MAIN ARTICLE *volume 10 page 36*, *picture*, *volume 10 page 36*

MORE TO EXPLORE

civil rights movement *volume 3 page 129*

Montgomery *volume 8 page 177*

parliament (form of government)

Canadian House of Commons *picture*, *volume 10 page 37*

Elizabethan Parliament *picture*, *volume 10 page 38*

government *volume 5 page 132*

Parliament (government of the United Kingdom)

MAIN ARTICLE *volume 10 page 37*, *picture*, *volume 10 page 38*

MORE TO EXPLORE

England *volume 4 page 141*

legislature *volume 7 page 124*

United Kingdom *volume 14 page 18*

Parliament, Houses of (buildings in London, England, United Kingdom): *see in index* Westminster, Palace of

Parliament House (building in Canberra, Australia) *picture*, *volume 3 page 29*

Parque Nacional Canaima (park in Venezuela): *see in index* Canaima, Parque Nacional

Parr, Catherine (queen of England): *see in index* Catherine Parr

Parrant, Pierre (French-Canadian trader) Saint Paul *volume 12 page 16*

parrot (bird)

Dominica *volume 4 page 65*

parrot family *volume 10 page 38*

parrot family (bird family)

MAIN ARTICLE *volume 10 page 38*

MORE TO EXPLORE

lorikeets *picture*, *volume 10 page 39*

Parsiism (religion): *see in index* Zoroastrianism

Parthenon (temple in Athens, Greece) architecture *volume 1 page 169*
Athens *volume 1 page 19*

Parthian (people)

Persia *volume 10 page 61*

partial deafness

deafness *volume 4 page 21*

partial eclipse (astronomy)

eclipse *volume 4 page 98*

partial vacuum

vacuum *volume 14 page 50*

particle radiation (physics): *see in index* nuclear radiation

partition (architecture): *see in index* wall

party system: *see in index* political party

Pashtun (Asian people)

Afghanistan *volume 1 page 36*

Pakistan *volume 10 page 13*

Passamaquoddy (Native American people)

Abnaki *volume 1 page 10*

passenger pigeon (bird)

extinct animals *volume 1 page 126*

pigeon *volume 10 page 84*

passenger train (railroad)

railroad *volume 11 page 20*

passionflower (plant)

mimicry *volume 8 page 131*

Passover (Judaism)

MAIN ARTICLE *volume 10 page 39*, *picture*, *volume 10 page 40*

Pasternak, Boris (Russian author)

Soviet Union *volume 14 page 12*

Pasteur, Louis (French chemist and microbiologist)

MAIN ARTICLE *volume 10 page 40*, *picture*, *volume 10 page 40*

MORE TO EXPLORE

vaccine *volume 14 page 49*

pasteurization (heating process)

Pasteur *volume 10 page 40*

pastime (personal interest activity): *see in index* hobby

pastoral nomadism

nomad *volume 9 page 76*

Patagonia (region in Argentina)

Argentina *volume 1 page 175*

cattle herding *picture*, *volume 3 page 61*

glacier *picture*, *volume 1 page 175*

Mount Fitzroy *picture*, *volume 1 page 118*

patella (bone)

knee *volume 7 page 74*

Paterson, Katherine (U.S. author)

literature for children *volume 7 page 164*

Pathan (Asian people): *see in index* Pash-tun

Pathet Lao (nationalist organization in Laos)

Laos *volume 7 page 107*

Pathfinder (United States spacecraft)

Mars *volume 8 page 59*

view of Sojourner *picture*, *volume 8 page 59*

pathogen (disease-producing organism) human disease *volume 4 page 56*

patina (art)

bronze *volume 2 page 134*

patois (language): *see in index* dialect

patriarch (Eastern Orthodoxy)

Eastern Orthodox Churches *volume 4 page 94*

patrician (ancient Roman class)

ancient Rome *volume 11 page 89*

Patrick, Saint (bishop and patron saint of Ireland)

Saint Patrick's Day *volume 12 page 15*

patrolling (police science)

police *volume 10 page 111*

pattern (art)

painting *volume 10 page 8*

Paul, John (U.S. naval officer): *see in index* Jones, John Paul

Paul the Apostle, Saint (Christian Apostle)

Christianity *volume 3 page 113*

pavement (civil engineering)

road *volume 11 page 70*

Paviotso (Native American people): *see in index* Northern Paiute

Pawnee (Native American people)

MAIN ARTICLE *volume 10 page 41*

MORE TO EXPLORE

Pawnee traditional clothing *picture*, *volume 10 page 41*

pawpaw (fruit): *see in index* papaya

Pawtuxet (Native American people)

Squanto *volume 12 page 170*

Payton, Walter (U.S. athlete)

MAIN ARTICLE *volume 10 page 42, picture, volume 10 page 42*

Pb (chemical element): *see in index* lead

PC: *see in index* personal computer

PDA (handheld computer): *see in index* personal digital assistant

P. Diddy (U.S. rapper and music producer): *see in index* Combs, Sean

pea (legume)

MAIN ARTICLE *volume 10 page 42, picture, volume 7 page 125, picture, volume 10 page 42*

MORE TO EXPLORE

legume *volume 7 page 125*

peace

Carter *volume 3 page 47*

Peace Corps (United States agency)

MAIN ARTICLE *volume 10 page 43, picture, volume 10 page 43*

MORE TO EXPLORE

Kennedy *volume 7 page 55*

Peace Garden State (state in the U.S.): *see in index* North Dakota

peacekeeping mission

United Nations troops *picture, volume 14 page 22*

Peace Memorial Park (park in Hiroshima, Japan)

Hiroshima *volume 6 page 60*
origami memorials *picture, volume 6 page 60*

peace movements

MAIN ARTICLE *volume 10 page 44, picture, volume 10 page 44*

Peace of Paris (1783): *see in index* Paris, Treaty of

Peace Palace (building in The Hague, Netherlands) *picture, volume 6 page 6*

Peace Park (park in Taipei, Taiwan) *picture, volume 13 page 7*

peach (tree and fruit)

MAIN ARTICLE *volume 10 page 45, picture, volume 10 page 45*

peacock (bird)

MAIN ARTICLE *volume 10 page 46, picture, volume 10 page 46*

MORE TO EXPLORE

tail *volume 13 page 7*

peahen (bird)

peacock *volume 10 page 46*

peanut (plant)

MAIN ARTICLE *volume 10 page 46, picture, volume 10 page 47*

MORE TO EXPLORE

Carver *volume 3 page 51*

legume *volume 7 page 125*

nut *volume 9 page 112*

Senegal *volume 12 page 67, picture, volume 12 page 67*

“Peanuts” (comic strip by Schulz)

Schulz *volume 12 page 48, picture, volume 3 page 49*

pea order (plant): *see in index* legume

pear (tree and fruit)

MAIN ARTICLE *volume 10 page 47*

MORE TO EXPLORE

Anjou pears *picture, volume 10 page 47*

pearl (gemstone)

bivalve *volume 2 page 84*

jewelry and gems *volume 7 page 24*

mollusk shells *picture, volume 7 page 24*

pearl barley (cereal)

barley *volume 2 page 29*

Pearl Harbor (naval base in Hawaii, U.S.)

Honolulu *volume 6 page 80*

World War II *volume 15 page 68*

Pearl Harbor attack (Japanese-U.S. history)

Hawaii *volume 6 page 27*

Japan *volume 7 page 15*

peace movements *volume 10 page 45*

pearl millet (grain)

millet *volume 8 page 130*

Peary, Robert E. (U.S. explorer)

MAIN ARTICLE *volume 10 page 48, picture, volume 10 page 48*

MORE TO EXPLORE

Arctic Ocean *volume 1 page 173*

exploration *volume 4 page 174*

Henson *volume 6 page 41*

polar exploration *volume 10 page 110, picture, volume 10 page 110*

peasant (social class)

feudalism *volume 5 page 14*

peat (fossil fuel)

bog *volume 2 page 99, picture, volume 2 page 99*

coal *volume 3 page 144*

Okefenokee Swamp *volume 9 page 128*

peat moss (plant)

moss *volume 8 page 190*

pecan (tree and nut)

hickory *volume 6 page 50*

pedal (bicycle part)

machine *volume 8 page 7*

pediatrics (branch of medicine)

pediatrician and child *picture, volume 8 page 92*

Pedro I (emperor of Brazil): *see in index* Pedro, Dom

Pedro II (emperor of Brazil)

Brazil *volume 2 page 127*

Pedro, Dom (emperor of Brazil)

Brazil *volume 2 page 127*

Pedro de Alcântara, Dom (emperor of Brazil): *see in index* Pedro II

Pedro Miguel Locks (Panama Canal) *picture, volume 10 page 23*

peer group (social relationship)

child development *volume 3 page 97*

Pegasus (Greek mythology)

MAIN ARTICLE *volume 10 page 49, picture, volume 10 page 49*

Peking (capital city of China): *see in index* Beijing

pelagic sea snake (reptile): *see in index* yellow-bellied sea snake

Pelé (Brazilian athlete)

MAIN ARTICLE *volume 10 page 50, picture, volume 10 page 50*

Pelecypoda (mollusk): *see in index* bivalve

Pelée, Mount (volcano in Martinique) *Martinique volume 8 page 66*

pelican (bird)

MAIN ARTICLE *volume 10 page 51*

MORE TO EXPLORE

brown pelican *picture, volume 10 page 51*

Peloponnesian War (ancient Greek history)
ancient Greece *volume 5 page 156*
Sparta *volume 12 page 161*

pelvis (anatomy)
dinosaur classification *picture, volume 4 page 50*

Pemba (island of Tanzania)
Tanzania *volume 13 page 15*

Pembroke Welsh corgi (breed of dog)
herding dogs *table, volume 4 page 62*

pen (writing tool)
drawing *volume 4 page 75*

Penacook Plantation (town in New Hampshire, U.S.): *see in index* Concord

penal colony
Australian history *volume 1 page 231*
Port Arthur *picture, volume 13 page 20*
Sydney *volume 12 page 221*
colony *volume 3 page 155*

penalty (law): *see in index* punishment

penalty (sports)
rugby *volume 11 page 103*
soccer *volume 12 page 118*

penalty kick (sports)
soccer *volume 12 page 118, picture, volume 12 page 118*

pencil (writing tool)
drawing *volume 4 page 75*

Pendleton Civil Service Act (U.S. legislation, 1883)
Arthur *volume 1 page 193*

pendulum (device)
MAIN ARTICLE *volume 10 page 51, picture, volume 10 page 52*
MORE TO EXPLORE
Galileo *volume 5 page 82*

penguin (bird)
MAIN ARTICLE *volume 10 page 52, picture, volume 10 page 52*
MORE TO EXPLORE
Antarctica *volume 1 page 137, picture, volume 1 page 135*
birds *volume 2 page 77*
Falkland Islands *picture, volume 5 page 5*
flightless birds *volume 2 page 79*

penicillin (drug)
MAIN ARTICLE *volume 10 page 53*

MORE TO EXPLORE
antibiotics *volume 1 page 142*
fermentation *volume 5 page 11*
penicillium mold *picture, volume 10 page 53*

penis (anatomy) *picture, volume 11 page 47*
reproductive system *volume 11 page 48*

penitentiary: *see in index* prison

Penn, William (English Quaker leader and colonist)
MAIN ARTICLE *volume 10 page 54, picture, volume 10 page 54*

MORE TO EXPLORE
Dover *volume 4 page 69*
Pennsylvania *volume 10 page 56*
Philadelphia *volume 10 page 70*

Pennacook (Native American people)
Abnaki *volume 1 page 10*
New Hampshire *volume 9 page 48*

Pennsylvania (state in the U.S.)
MAIN ARTICLE *volume 10 page 55*

MORE TO EXPLORE
family works on a farm *picture, volume 10 page 56*
geography
Gettysburg National Military Park *picture, volume 10 page 57*
Independence Hall *picture, volume 10 page 70*
Lake Erie *picture, volume 4 page 149*
Pittsburgh *picture, volume 10 page 57*
history
Delaware *volume 4 page 31*
Liberty Bell *picture, volume 7 page 141*
Penn *volume 10 page 54*

Pennsylvania Provincial Assembly (building in Philadelphia, Pennsylvania, U.S.): *see in index* Independence Hall

penny-farthing (bicycle): *see in index* ordinary

Penobscot (Native American people)
Abnaki *volume 1 page 10*

Pentagon (building in Arlington, Virginia, U.S.)
bin Laden *volume 2 page 71*
damage from September 11 *picture, volume 13 page 49*

pentathlon (athletic competition)
Thorpe *volume 13 page 61*

peony (plant and flower)
MAIN ARTICLE *volume 10 page 58, picture, volume 10 page 58*

people: *see in index* aboriginal peoples; Asian peoples; European peoples; human being; Middle Eastern and North African peoples; Native American

people's commune (Chinese agricultural system): *see in index* commune

People's Democratic Republic of Yemen (historical country in the Middle East)
Yemen *volume 15 page 91*

peoples of the United States: *see in index* African American; Asian American; Hispanic American; North American Indian

People's Palace (building in Tripoli, Libya) *picture, volume 13 page 98*

People's Republic of China (country in Asia): *see in index* China

People United to Save Humanity (U.S. organization): *see in index* PUSH, Operation

People United to Serve Humanity (U.S. organization): *see in index* PUSH, Operation

Peoria Tribe of Oklahoma (Native American people): *see in index* Illinois

pepper (plant and fruit)
MAIN ARTICLE *volume 10 page 58, picture, volume 10 page 58*

MORE TO EXPLORE
cooking on a grill *picture, volume 6 page 32*

Pequot (Native American people)
MAIN ARTICLE *volume 10 page 59*
MORE TO EXPLORE

decorated Pequot canoe *picture, volume 10 page 59*
Mohegan *volume 8 page 152*

perch (fish)
four animal skeletal systems *picture, volume 12 page 95*

perching duck (waterfowl)
duck *volume 4 page 81*

percussion instrument (musical instrument)
music *volume 8 page 213*

musical instruments *volume 8 page 215*,
picture, volume 8 page 215
 orchestra *volume 9 page 145*, *picture*,
volume 9 page 145

peregrine falcon (bird)
 falcon *volume 5 page 4*

Perekop Isthmus (isthmus in the
 Ukraine)
 Crimea *volume 3 page 217*

Peri, Jacopo (Italian composer)
 opera *volume 9 page 142*

Pericles (Athenian statesman)
 Athens *volume 1 page 219*

pericycle (botany)
 root *picture, volume 11 page 96*

period (physiology): *see in index* men-
 struation

periodical (publication): *see in index*
 magazine

periodic table (chemistry) *table, volume 3*
page 86
 chemical element *volume 3*
page 86

peristalsis (involuntary muscular action)
 digestive system *volume 4 page 47*

Perkin, William Henry (British chemist)
 technology and invention *volume 13*
page 27

permafrost (geology)
 tundra *volume 13 page 107*

permanent memory (mental function):
see in index long-term memory

permanent tooth (anatomy)
 teeth *volume 13 page 30*, *picture, vol-*
ume 13 page 31

Perón, Juan (president of Argentina)
 Argentina *volume 1 page 176*

Perry, Oliver Hazard (U.S. naval officer)
 War of 1812 *volume 15 page 13*

Persephone (Greek goddess)
 ancient coin *picture, volume 3 page 47*
 Demeter *volume 4 page 34*
 Hades *volume 6 page 5*

Persepolis (ancient Persian city)
 Apadana *picture, volume 10 page 61*

Perseus (Greek mythology)
 MAIN ARTICLE *volume 10 page 60*, *picture*,
volume 10 page 60
 MORE TO EXPLORE
 Pegasus *volume 10 page 49*

Persia (historic region and kingdom in
 Asia)
 MAIN ARTICLE *volume 10 page 61*
 MORE TO EXPLORE
 Alexander the Great *volume 1 page 73*
 Iran *volume 6 page 148*
 Muscat *volume 8 page 207*
 painting *picture, volume 10 page 8*
 Persian Wars *volume 10 page 63*
 Peter the Great *volume 10 page 67*
 ruins in Persepolis *picture, volume 10*
page 61
 Zoroastrianism *volume 15 page 110*

Persian (people)
 Iran *volume 6 page 148*

Persian Empire (historic empire from
 about 550 BC–640 AD): *see in index*
 Persia

Persian Gulf War (1991)
 MAIN ARTICLE *volume 10 page 62*
 MORE TO EXPLORE
 Arab nations
 Iraq *volume 6 page 153*
 Baghdad *volume 2 page 7*
 Saddam Hussein *volume 12 page 7*
 Kuwait *volume 7 page 91*, *volume 7*
page 92
 Saudi Arabia *volume 12 page 45*
 United States
 Bush *volume 2 page 155*
 Powell *volume 10 page 141*
 Schwarzkopf with troops *picture, vol-*
ume 10 page 62

Persian language: *see in index* Farsi lan-
 guage

Persian lynx (mammal): *see in index* cara-
 cal

Persian Wars (ancient Greek and Persian
 history)
 MAIN ARTICLE *volume 10 page 63*, *picture*,
volume 10 page 63
 MORE TO EXPLORE
 ancient Greece *volume 5 page 155*
 Sparta *volume 12 page 161*

personal computer
 computer *volume 3 page 172*
 electronic games *volume 4 page 121*

personal digital assistant (handheld
 computer)
 computer *volume 3 page 172*

Perth (state capital of Western Australia,
 Australia)
 Western Australia *volume 15 page 30*

Peru (country in South America)
 MAIN ARTICLE *volume 10 page 64*
 MORE TO EXPLORE

geography
 Andes valley farmland *picture, vol-*
ume 10 page 65
 macaws *picture, volume 10 page 64*
 Machu Picchu *volume 8 page 8*
 town plaza in Arequipa *picture, vol-*
ume 10 page 65
 history
 Bolívar *volume 2 page 101*
 De Soto *volume 4 page 41*
 Ecuador *volume 4 page 103*

Pesach (Judaism): *see in index* Passover

Pest (former town in Hungary)
 Budapest *volume 2 page 141*

pest (vermin)
 rodent *volume 11 page 28*, *volume 11*
page 80

pesticide (chemical agent)
 food poisoning *volume 5 page 46*
 pollution *volume 10 page 118*

pet (animal)
 MAIN ARTICLE *volume 10 page 66*
 MORE TO EXPLORE
 dog *picture, volume 10 page 66*
 veterinary medicine *volume 14 page 75*

petal (botany)
 cabbage *volume 3 page 4*
 rose *volume 11 page 97*

Petén (forested region in Guatemala)
 Guatemala *volume 5 page 166*

Peter, Saint (Christian Apostle)
 pope *volume 10 page 125*

Peter I (emperor of Russia): *see in index*
 Peter the Great

Peter IV of Portugal (emperor of Brazil):
see in index Pedro, Dom

Peter Pan (fictional character)
 dramatization *picture, volume 4 page 72*

Peter the Apostle, Saint (Christian
 Apostle): *see in index* Peter, Saint

Peter the Great (emperor of Russia)

MAIN ARTICLE *volume 10 page 66*, *picture*, *volume 10 page 67*

MORE TO EXPLORE

Russia *volume 11 page 106*

Saint Petersburg *volume 12 page 17*

tsar *volume 13 page 103*

petiole (botany)

leaf *volume 7 page 118*

Petipa, Marius (French-Russian dancer and choreographer)

ballet *volume 2 page 14*

dance *volume 4 page 13*

Petra (ancient city in Jordan) *picture*, *volume 7 page 34*

Petrarch, Francesco (Italian poet)

Renaissance *volume 11 page 45*

petroglyph (rock carving)

Hohokam rock carvings *picture*, *volume 6 page 69*

Ute rock carvings *picture*, *volume 14 page 46*

Petrograd (city in Russia): *see in index* Saint Petersburg

petrol engine: *see in index* gasoline engine

petroleum (fossil fuel)

MAIN ARTICLE *volume 10 page 67*

MORE TO EXPLORE

acid rain *volume 1 page 18*

automobile *volume 1 page 237*

delta *volume 4 page 34*

energy *picture*, *volume 4 page 139*

fibers *volume 5 page 17*

polyester cloth *picture*, *volume 13 page 28*

fossil fuel *volume 5 page 55*

geographical reserves

Africa

Gabon *volume 5 page 78*

Libya *volume 7 page 144*

Luanda *volume 7 page 183*

Malabo *volume 8 page 24*

Mauritania *volume 8 page 79*, *volume 9 page 100*

Nigeria *volume 9 page 69*

Sao Tome and Principe *volume 12 page 36*

Sudan *volume 12 page 200*

Tunisia *volume 13 page 109*

Asia

Baku *volume 2 page 10*

Kazakhstan *volume 7 page 52*

Malaysia *volume 8 page 28*

Myanmar *volume 8 page 221*

Pakistan *volume 10 page 14*

Turkmenistan *volume 13 page 115*

Uzbekistan *volume 14 page 47*

Vietnam *volume 14 page 85*

Central America and West Indies

Trinidad and Tobago *volume 13 page 97*

Eurasia

Turkey *volume 13 page 112*

Europe

North Sea *volume 9 page 92*, *picture*, *volume 9 page 93*

Norway *volume 9 page 98*

Romania *volume 11 page 85*

Russia *volume 11 page 105*

Ukraine *volume 14 page 7*

United Kingdom *volume 12 page 52*, *volume 14 page 18*

Middle East *volume 8 page 124*

Kuwait *volume 7 page 91*, *volume 7 page 92*

Manama *volume 8 page 39*

Oman *volume 9 page 136*

Qatar *volume 4 page 64*, *volume 11 page 4*

Red Sea *volume 11 page 37*

Riyadh *volume 11 page 69*

Saudi Arabia *volume 12 page 45*

Syria *volume 12 page 224*

United Arab Emirates *volume 14 page 15*

North America

Colorado *volume 3 page 157*

Mexico *volume 8 page 111*, *volume 8 page 113*

Oklahoma City *volume 9 page 131*

Rocky Mountains *volume 11 page 79*

Pacific Ocean

Australia *volume 14 page 78*

Papua New Guinea *volume 10 page 29*

Western Australia *volume 15 page 31*

South America

Colombia *volume 3 page 153*

Peru *volume 10 page 65*

Suriname *volume 12 page 208*

Tierra del Fuego *volume 13 page 65*

Venezuela *volume 14 page 64*

natural gas *volume 5 page 91*

OPEC *volume 9 page 150*

tanker *picture*, *volume 10 page 68*

technology and invention *volume 13 page 27*

Petroleum Exporting Countries, Organization of the (multinational organization): *see in index* OPEC

petroleum refinery

petroleum *volume 10 page 68*

plant in Saudi Arabia *picture*, *volume 8 page 124*

Petronas Twin Towers (buildings in

Kuala Lumpur, Malaysia) *picture*, *volume 7 page 88*

four of the world's tallest buildings *picture*, *volume 12 page 104*

pew (furniture)

church *volume 3 page 117*

Phaedrus (Roman writer)

Aesop *volume 1 page 35*

Phalaenopsis (plant genus): *see in index* moth orchid

phalanx (bone)

arm *picture*, *volume 1 page 182*

Phanerozoic eon (time period)

geology *volume 5 page 97*

pharaoh (Egyptian king title)

MAIN ARTICLE *volume 10 page 68*, *picture*, *volume 10 page 69*

MORE TO EXPLORE

ancient Egypt *volume 4 page 114*

pharmacy (physiology)

drug *volume 4 page 78*

Pharos of Alexandria (ancient lighthouse

in Alexandria, Egypt): *see in index*

Lighthouse of Alexandria

pharynx (anatomy)

human digestive system *picture*, *volume 4 page 47*

respiratory system *volume 11 page 54*

tonsillitis *picture*, *volume 13 page 81*

phase (astronomy)

Moon *volume 8 page 179*

pheromone (type of hormone)

hormone *volume 6 page 84*

Philadelphia (city in Pennsylvania, U.S.)

MAIN ARTICLE *volume 10 page 69*

MORE TO EXPLORE

American Revolution *volume 1 page 99*

Franklin *volume 5 page 63*

Independence Hall *picture, volume 10 page 70*
 Liberty Bell *picture, volume 7 page 141*

philately (hobby): *see in index* stamp collecting

Philip II (king of Macedonia)
 Alexander the Great *volume 1 page 73*
 ancient Greece *volume 5 page 156*

Philip II (king of Spain and Portugal)
 Drake *volume 4 page 71*
 Elizabeth I *volume 4 page 126*

Philip IV (king of Spain and Portugal)
 Velázquez *volume 14 page 61*

Philip, duke of Edinburgh (British prince)
 Elizabeth II *volume 4 page 126*

Philippines (island country of southeast Asia)

MAIN ARTICLE *volume 10 page 71*

MORE TO EXPLORE

geography

Asia *volume 1 page 200*

Manila *picture, volume 8 page 43*

Mount Mayon *picture, volume 10 page 72*

rice field *picture, volume 10 page 72*

history

Spanish-American War *volume 12 page 157*

Taft *volume 13 page 4*

World War II *volume 15 page 69*

Phillip, Arthur (British admiral)
 Australia *volume 1 page 231*

Phillips, Sam (U.S. record producer)
 Presley *volume 10 page 147*

philosophy

MAIN ARTICLE *volume 10 page 73, picture, volume 10 page 73*

MORE TO EXPLORE

Enlightenment *volume 4 page 143*

phloem (plant tissue)
 bark *volume 2 page 28*

Phnom Penh (capital city of Cambodia)
 MAIN ARTICLE *volume 10 page 73, picture, volume 10 page 74*

MORE TO EXPLORE

Cambodia *volume 3 page 17*

phobia (psychology)
 mental illness *volume 8 page 100*

Phobos (satellite of Mars)
 Mars *volume 8 page 58*

Phoenicia (historical region in the Middle East)
 Phoenician ship *picture, volume 10 page 74*
 Phoenicians *volume 10 page 74*

Phoenician (people)

MAIN ARTICLE *volume 10 page 74*

MORE TO EXPLORE

alphabet *volume 1 page 88*

Carthage *volume 3 page 47*

empire *volume 4 page 131*

Lisbon *volume 7 page 159*

Tripoli *volume 13 page 98*

Tunis *volume 13 page 108*

Tunisia *volume 13 page 110*

Phoenix (state capital of Arizona, U.S.)

MAIN ARTICLE *volume 10 page 75*

MORE TO EXPLORE

Arizona *volume 1 page 178*

telecommunication antennas *picture, volume 13 page 34*

Tonto National Forest *picture, volume 10 page 75*

Phoenix (mythological bird)
 legendary animals *volume 1 page 129*

phone (communication device): *see in index* telephone

phonograph (sound-reproduction device)
 1877 Edison phonograph *picture, volume 12 page 135*

Edison *volume 4 page 105*

Edison and his tinfoil phonograph *picture, volume 4 page 105*

sound recording *volume 12 page 136*

phosphate (chemical compound)
 Nauru *volume 9 page 22*

photograph (picture)
 movie *volume 8 page 197*

photographer
 newspaper *volume 9 page 54*

photographic film: *see in index* film

photography
 MAIN ARTICLE *volume 10 page 76, picture, volume 10 page 76, picture, volume 10 page 77*

MORE TO EXPLORE

Adams *volume 1 page 21*

solar flare *picture, volume 12 page 203*

photosynthesis (biological process in plants)

MAIN ARTICLE *volume 10 page 78, picture, volume 10 page 78*

MORE TO EXPLORE

air *volume 1 page 51*

algae *volume 1 page 77*

enzyme *volume 4 page 144*

forest *volume 5 page 54*

leaf *volume 7 page 118*

light *volume 7 page 149*

plankton *volume 10 page 94*

plant *volume 10 page 95*

rain forest *volume 11 page 25*

physical anthropology (science)
 anthropology *volume 1 page 141*

physical geography (science)
 geography *volume 5 page 96*

physical property
 matter *volume 8 page 78*

physical sciences
 science *volume 12 page 49*

physician (medical worker): *see in index* doctor

physics (science)
 MAIN ARTICLE *volume 10 page 78*

MORE TO EXPLORE

electric spark generator *picture, volume 10 page 79*

Newton *volume 9 page 55*

physiographic map: *see in index* topographic map

physiology (biology): *see in index* cardiovascular system; circulatory system; digestive system; endocrine system; enzyme; excretion; immune system; lymphatic system; nervous system; reproductive system; respiratory system; skeletal system; urinary system

phytoplankton (biology)
 ocean *volume 9 page 118*
 plankton *volume 10 page 94*

piano (musical instrument)
 keyboard instruments *picture, volume 8 page 217*
 musical instruments *volume 8 page 217*

“Piano Lesson, The” (play by Wilson)
 performance *picture, volume 4 page 74*

Piast dynasty (Polish ruling family)
Poland *volume 10 page 108*

Picasso, Pablo (Spanish artist)
MAIN ARTICLE *volume 10 page 79*

MORE TO EXPLORE
painting *volume 10 page 11*
steel sculpture *picture, volume 10 page 79*

Piccard, Auguste (Swiss-Belgian physicist)
bathyscaphe *picture, volume 4 page 174*

Piccard, Bertrand (Swiss balloonist)
balloon *volume 2 page 16*

Piccard, Jacques (Swiss oceanic engineer)
bathyscaphe *picture, volume 4 page 174*
exploration *volume 4 page 174*

Pichincha (volcano in Ecuador)
Quito *volume 11 page 11*

pickling (food preservation process)
vinegar *volume 14 page 92*

“Pickwick Papers, The” (work by Dickens)
Dickens *volume 4 page 45*

pictography (communication): *see in index* picture writing

picture book (type of book)
literature for children *volume 7 page 163*

picture writing (communication)
alphabet *volume 1 page 88*
writing *volume 15 page 77*

pidgin language
language *volume 7 page 105*

pie chart (diagram): *see in index* circle graph

Pied Piper of Hamelin (German legend)
picture, volume 5 page 162

Piegan (North American people)
Blackfoot *volume 2 page 85*

pie graph (diagram): *see in index* circle graph

pieplant (plant and food): *see in index* rhubarb

Pierce, Barbara (first lady of the U.S.):
see in index Bush, Barbara

Pierce, Franklin (president of the U.S.)
MAIN ARTICLE *volume 10 page 80, picture, volume 10 page 80*

MORE TO EXPLORE
Davis *volume 4 page 19*
timeline *volume 10 page 80*

Pierre (state capital of South Dakota, U.S.)
MAIN ARTICLE *volume 10 page 82*
MORE TO EXPLORE
South Dakota *volume 12 page 149*
State Capitol *picture, volume 10 page 82*

“Pietà” (sculpture by Michelangelo) *picture, volume 8 page 115*
Michelangelo *volume 8 page 115*

pig (mammal)
MAIN ARTICLE *volume 10 page 82, picture, volume 10 page 82, picture, volume 10 page 83*

MORE TO EXPLORE
piglets *picture, volume 9 page 99*
vertebrate embryo development *picture, volume 5 page 109*

pigeon (bird)
MAIN ARTICLE *volume 10 page 83*

pigment (chemistry)
color *volume 3 page 156, picture, volume 3 page 156*

Pig’s Eye (frontier settlement, Minnesota, U.S.): *see in index* Saint Paul

pile (textiles)
rug and carpet *volume 11 page 101*

pilgrim (religion): *see in index* pilgrimage

pilgrimage (religious practice)
MAIN ARTICLE *volume 10 page 84*

MORE TO EXPLORE
Hinduism *volume 6 page 57*
ritual bathing *picture, volume 10 page 85*
Islam *volume 6 page 164*
Mecca *volume 8 page 90*
Haram Mosque, al- *picture, volume 8 page 91*

Pilgrim Fathers (U.S. history)
Massachusetts *volume 8 page 72*
Massasoit *volume 8 page 75, picture, volume 1 page 105*
“Mayflower” *volume 8 page 83*
Plymouth Colony *volume 10 page 102*
landing at Plymouth Rock *picture, volume 10 page 102*

Puritans *volume 10 page 169*
Squanto *volume 12 page 170*
Thanksgiving *volume 13 page 56*
Wampanoag *volume 15 page 7*

Pilgrims (U.S. history): *see in index* Pilgrim Fathers

pillars of Islam (religion): *see in index* Islam, five pillars of

piloting (navigational technique)
navigation *volume 9 page 23*

Pima (Native American people)
MAIN ARTICLE *volume 10 page 85, picture, volume 10 page 86*

pimple (skin lesion)
acne *volume 1 page 18, picture, volume 1 page 19*

pin (wrestling): *see in index* fall

piña cloth (fabric)
pineapple *volume 10 page 87*

Pinatubo, Mount (volcano in the Philippines)
volcano *volume 14 page 102*

pinching bug (insect): *see in index* stag beetle

pine (tree)
MAIN ARTICLE *volume 10 page 86, picture, volume 10 page 86*

pineapple (plant and fruit)
MAIN ARTICLE *volume 10 page 87, picture, volume 10 page 87*

Pine Tree State (state in the U.S.): *see in index* Maine

pink fairy armadillo (mammal)
armadillo *volume 1 page 183*

pink salmon (fish)
salmon *volume 12 page 22*

Pinnacles Desert (desert in state of Western Australia, Australia)
limestone formations *picture, volume 15 page 30*

Pinochet, Augusto (president of Chile)
picture, volume 4 page 46
Chile *volume 3 page 99*

“Pinta” (ship)
Columbus *volume 3 page 163*

pioneer life (U.S. history)

MAIN ARTICLE *volume 10 page 88, picture, volume 10 page 88*

pipe organ (musical instrument)

keyboard instruments *picture, volume 8 page 217*

Pipil (Native American people)

El Salvador *volume 4 page 129*

Pippin III (king of the Franks)

Charlemagne *volume 3 page 81*

piracy (maritime law)

pirate *volume 10 page 89*

pirate (maritime law)

MAIN ARTICLE *volume 10 page 88*

MORE TO EXPLORE

Blackbeard *picture, volume 10 page 89*

Nassau *volume 9 page 12*

Rabat *volume 11 page 13*

Pisces (astronomy)

constellation *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

Pissarro, Camille (French artist)

painting *volume 10 page 10*

“The Wheelbarrow, Orchard” *picture, volume 10 page 10*

pistil (botany)

flower *volume 5 page 38*

images

parts of a flower *picture, volume 5 page 38*

self-pollination *picture, volume 10 page 116*

piston (engine component)

internal-combustion engine *volume 6 page 141, picture, volume 6 page 140*

piston engine (motor): *see in index* reciprocating engine**pit** (animal organ)

rattlesnake *volume 11 page 29*

pit (botany)

plum *volume 10 page 101*

pitch (cricket)

cricket *volume 3 page 214, picture, volume 3 page 214*

pitch (sound)

music *volume 8 page 213*

sound *volume 12 page 135, picture, volume 12 page 135*

pitcher (sports)

baseball *volume 2 page 31*

softball *picture, volume 12 page 124*

Pitcher, Molly (U.S. patriot)

battle of Monmouth *picture, volume 1 page 102*

pitcher plant (insectivorous plant)

MAIN ARTICLE *volume 10 page 90, picture, volume 10 page 90*

MORE TO EXPLORE

ecologist studying pitcher plants *picture, volume 4 page 99*

pitcher's mound (part of baseball field)

baseball field *picture, volume 2 page 31*

pitching rubber (part of baseball field):

see in index rubber

Pittsburgh (city in Pennsylvania, U.S.)

picture, volume 10 page 57

glass *volume 5 page 119*

radio *volume 11 page 19*

pituitary gland (anatomy) *picture, volume 4 page 136*

endocrine system *volume 4 page 135,*

picture, volume 4 page 135

pit viper (snake)

viper *volume 14 page 93*

Piute (Native American people): *see in index* Paiute**Pizarro, Francisco** (Spanish explorer)

MAIN ARTICLE *volume 10 page 90, picture, volume 10 page 91*

MORE TO EXPLORE

conquistador *volume 3 page 186*

exploration of the Americas *volume 1 page 104, picture, volume 1 page 104*

Lima *volume 7 page 152*

Peru *volume 10 page 65*

Inca *volume 6 page 121*

placenta (human and animal reproductive organ)

gestation *volume 5 page 108*

reproductive system *volume 11 page 49*

placental (mammal)

gestation *volume 5 page 109*

plague (disease)

MAIN ARTICLE *volume 10 page 91*

MORE TO EXPLORE

doctor visiting a patient infected with the plague *picture, volume 10 page 91*

epidemic *volume 4 page 146*

Plains Cree (Native American people)

Cree people *volume 3 page 212*

Plains Indians (Native American peoples)

Coeur d'Alene *volume 3 page 149*

Native Americans *volume 9 page 17*

plaintiff (law)

law *volume 7 page 117*

plane (aircraft): *see in index* airplane**plane mirror** (reflective surface)

mirror *volume 8 page 139*

planet

MAIN ARTICLE *volume 10 page 92, picture, volume 10 page 93*

MORE TO EXPLORE

Earth *picture, volume 4 page 90*

globe *picture, volume 8 page 49*

gravity *volume 5 page 144*

Jupiter *picture, volume 7 page 41*

Mars *picture, volume 8 page 58*

Saturn *picture, volume 12 page 42*

solar system *volume 12 page 127*

Venus *picture, volume 14 page 66*

Voyager 2 *picture, volume 14 page 39*

planetary wind

wind *volume 15 page 48*

planetoid (astronomy): *see in index* asteroid**planigale** (mammal)

marsupial *volume 8 page 63*

plankton (marine biology)

MAIN ARTICLE *volume 10 page 94*

plant (life form)

MAIN ARTICLE *volume 10 page 94*

MORE TO EXPLORE

acid rain damage *picture, volume 1 page 18*

adaptation *volume 1 page 26*

agriculture *volume 1 page 48*

biome *volume 2 page 73*

cell *picture, volume 3 page 67*

conifer *picture, volume 10 page 95*

endangered species *volume 4 page 133*

enzyme *volume 4 page 144*

food chain *volume 5 page 45*

growth from seed *picture, volume 10 page 96*

hormone *volume 6 page 84*

living thing *volume 7 page 169*

classification *picture, volume 7 page 168*

For more about plants, look for these articles:

<u>EDIBLE ROOTS</u>	Cherry	Sorghum	Maple	Moss
Beet	Citrus Fruit	Wheat	Oak	Mustard
Carrot	Cranberry		Palm	Pitcher Plant
Potato	Date	<u>LEGUMES</u>	Pine	Shamrock
Sweet Potato	Fig	Bean	Poplar	Tea
	Fruit	Legume	Redwood	Venus's-flytrap
<u>FLOWERS</u>	Grape	Pea	Rhododendron	
Carnation	Grapefruit	Peanut	Sycamore	<u>OTHER PLANT TOPICS</u>
Daisy	Lemon		Tree	Adaptation
Dandelion	Lime	<u>TREES</u>	Willow	Bark
Flower	Mango	Ash	Yew	Botany
Fuchsia	Melon	Aspen		Chocolate
Geranium	Olive	Birch	<u>VEGETABLES</u>	Ecosystem
Iris	Orange	Cedar	Asparagus	Fiber
Marigold	Papaya	Chestnut	Cucumber	Food Chain
Nightshade	Peach	Conifer	Garlic	Forest
Orchid	Pear	Cork	Gourd	Garden
Peony	Pineapple	Cypress	Lettuce	Habitat
Poppy	Plum	Elm	Onion	Herb
Rose	Raspberry	Eucalyptus	Pepper	Leaf
Sunflower	Strawberry	Fir	Pumpkin	Mimicry
Thistle	Tomato	Giant Sequoia	Rhubarb	Nut
Tulip		Ginkgo	Spinach	Photosynthesis
Violet	<u>GRASSES</u>	Hawthorn	Squash	Pollen
Water Lily	Bamboo	Hemlock	Vegetable	Rain Forest
	Barley	Hickory		Root
<u>FRUITS</u>	Corn	Holly	<u>OTHER PLANTS</u>	Seed
Apple	Grain	Juniper	Almond	Spice
Apricot	Grass	Larch	Cactus	Sugar
Avocado	Millet	Laurel	Cotton	Vanilla
Banana	Rice	Magnolia	Fern	
Berry	Rye	Mahogany	Heather	
Blueberry		Mangrove	Ivy	

parasite *volume 10 page 33*

photosynthesis *picture, volume 10 page 78*

rain forest *volume 11 page 24, picture, volume 11 page 24*

root *volume 11 page 96*

species on earth *picture, volume 7 page 167*

Plantagenet, Henry (king of England):
see in index Henry II

plantain (plant)
banana *volume 2 page 19*

plantation (agriculture)
Louisiana *volume 7 page 181*
trees line plantation road *picture, volume 7 page 181*
Mississippi *volume 8 page 142*
Puerto Rico *volume 10 page 165*

slavery *volume 12 page 106*

plant peony (plant)
peony *volume 10 page 58*

planula (zoology)
coral *volume 3 page 197*

plaque (dental)
dentistry *volume 4 page 38*
teeth *volume 13 page 31*

plasma (blood component)
blood *volume 2 page 92, picture, volume 2 page 92*

plasma display (electronics)
television *volume 13 page 41, picture, volume 13 page 40*

Plasmodium (protozoan genus)
parasite *volume 10 page 33*

plastic (chemical compound)
MAIN ARTICLE *volume 10 page 97*

plate (geology)
earthquake *volume 4 page 91*
mountain *volume 8 page 195*
plate tectonics *volume 10 page 98*
ring of fire *volume 11 page 66*
volcano *volume 14 page 100*

plate (printing)
book and bookmaking *volume 2 page 109, picture, volume 2 page 109*
printing *volume 10 page 152*

plate armor (protective clothing)
armor *volume 1 page 186*

plateau (landform)
Arabian Desert *picture, volume 1 page 157*

Plateau Indian (Native American people)
Native Americans *volume 9 page 18*

plate boundary (geology)
plate tectonics *volume 10 page 98*

platelet (blood cell)
blood *volume 2 page 92*, *picture, volume 2 page 92*

Plateosaurus (dinosaur)
dinosaurs in scale *picture, volume 4 page 53*

plate tectonics (geology)
MAIN ARTICLE *volume 10 page 98*
MORE TO EXPLORE
continent *volume 3 page 191*
mountain *volume 8 page 195*

platform mound (anthropology)
mound builders *volume 8 page 195*

platform stage (theater): *see in index*
thrust stage

Plato (ancient Greek philosopher)
painting by Raphael *picture, volume 10 page 73*

Platte River (river in Nebraska, U.S.)
crane migration *picture, volume 9 page 29*
Nebraska *volume 9 page 28*

platypus (mammal)
MAIN ARTICLE *volume 10 page 99*, *picture, volume 10 page 100*

play (behavior)
child development *volume 3 page 97*,
picture, volume 3 page 97

play (literature and theater): *see in index*
drama

playwright (theater and literature)
theater *volume 13 page 57*

Plaza de Mayo (square in Buenos Aires, Argentina): *see in index* Mayo, Plaza de

pleasure vessel: *see in index* cruise ship

plebeian (common people of ancient Rome)
ancient Rome *volume 11 page 89*

Plimpton, James (U.S. inventor)
roller skating *volume 11 page 81*

PLO (Palestinian political organization):
see in index Palestine Liberation Organization

Ploceidae (bird family): *see in index* Old World sparrow

plot (literature and theater)
drama *volume 4 page 72*

plough (farming tool): *see in index* plow

plow (farming tool)
Deere *volume 4 page 27*
steel plow *picture, volume 4 page 27*

plum (tree and fruit)
MAIN ARTICLE *volume 10 page 100*, *picture, volume 10 page 100*

Pluto (Greek and Roman mythology): *see in index* Hades

Pluto (dwarf planet)
MAIN ARTICLE *volume 10 page 101*, *picture, volume 10 page 101*

MORE TO EXPLORE
planets *volume 10 page 92*, *picture, volume 10 page 93*
solar system *volume 12 page 128*, *picture, volume 12 page 127*

Pluton (Greek god): *see in index* Hades

pluton (astronomy): *see in index* dwarf planet

Plymouth (city in Massachusetts, U.S.)
Massasoit *volume 8 page 75*
Plymouth Colony *volume 10 page 102*

Plymouth Colony (English settlement in New England)
MAIN ARTICLE *volume 10 page 102*, *picture, volume 10 page 102*

MORE TO EXPLORE
Massachusetts *volume 8 page 72*
“Mayflower” *volume 8 page 83*
Squanto *volume 12 page 170*
Thanksgiving *volume 13 page 56*

Plymouth Rock (U.S. history)
landing of the Pilgrims *picture, volume 10 page 102*

PM (time): *see in index* post meridiem

pneumonia (disease)
MAIN ARTICLE *volume 10 page 103*, *picture, volume 10 page 103*

MORE TO EXPLORE
cough *volume 3 page 207*
lung *volume 7 page 184*

pneumonic plague (disease)
plague *volume 10 page 92*

poaching (illegal hunting)
pet *volume 10 page 66*

Pocahontas (Powhatan princess)
MAIN ARTICLE *volume 10 page 103*, *picture, volume 10 page 104*

MORE TO EXPLORE
Jamestown *volume 7 page 11*

pod (plant reproductive body)
bean *volume 2 page 41*
pea *picture, volume 7 page 125*, *picture, volume 10 page 42*

Podgorica (capital city of Montenegro)
MAIN ARTICLE *volume 10 page 104*
MORE TO EXPLORE
Montenegro *volume 8 page 175*

podium (zoology): *see in index* tube foot

“Poems on Various Subjects, Religious and Moral” (book by Wheatley)
Wheatley *volume 15 page 40*

poet: *see in index* poetry

poetry (literature)
MAIN ARTICLE *volume 10 page 105*
MORE TO EXPLORE
literature *volume 7 page 160*

point (mathematics)
geometry *volume 5 page 98*

pointillism (art)
painting *volume 10 page 10*

poison (physiology)
MAIN ARTICLE *volume 10 page 106*, *picture, volume 10 page 106*
MORE TO EXPLORE
scorpion *volume 12 page 51*

poison hemlock (plant)
hemlock *volume 6 page 38*

poison ivy (plant)
poison *volume 10 page 106*

poison spur (platypus anatomy)
platypus *volume 10 page 99*

Pokanoket (Native American people): *see in index* Wampanoag

Poland (country in Europe)
MAIN ARTICLE *volume 10 page 107*
MORE TO EXPLORE
coal industry *picture, volume 3 page 144*
history
Lithuania *volume 7 page 165*
Prussia *volume 10 page 161*

Soviet Union *volume 14 page 13*
 timeline *volume 10 page 107*
 Ukraine *volume 14 page 7*
 World War II *volume 15 page 66*
 people and culture
 children in traditional clothing *picture, volume 10 page 108*
 Roman Catholic monastery *picture, volume 10 page 108*
 Solidarity demonstration *picture, volume 7 page 98*
 Warsaw *picture, volume 15 page 14*

polar bear (mammal) *picture, volume 2 page 42*
 bear *volume 2 page 41*
 polar bear mother with cubs *picture, volume 8 page 35*
 polar bear on Hudson Bay ice *picture, volume 8 page 45*

polar climate
 climate *volume 3 page 138*

polar exploration
 MAIN ARTICLE *volume 10 page 110*
 MORE TO EXPLORE

Henson and Peary at the North Pole
picture, volume 10 page 110
 use of sleds for supplies *picture, volume 10 page 111*

Polaroid Land camera
 photography *volume 10 page 77*

polder (reclaimed land)
 Netherlands *volume 9 page 38*

pole, magnetic (physics): *see in index* magnetic pole

polecat (mammal): *see in index* skunk

pole vault (athletics) *picture, volume 13 page 86*
 track and field *volume 13 page 86, picture, volume 13 page 85*

police
 MAIN ARTICLE *volume 10 page 111, picture, volume 10 page 112, picture, volume 10 page 112*
 MORE TO EXPLORE
 Coolidge *volume 3 page 195*

policy (government)
 United States government *volume 14 page 34*

polio (disease)
 MAIN ARTICLE *volume 10 page 113*

MORE TO EXPLORE
 child wearing a leg brace *picture, volume 10 page 113*
 nervous system *volume 9 page 36*
 Roosevelt *volume 11 page 92*
 Rudolph *volume 11 page 100*
 Salk *volume 12 page 21, picture, volume 12 page 21*

political asylum (law): *see in index* asylum

political campaign (politics): *see in index* campaign

political cartoon
 cartoon *volume 3 page 50*

political map (cartography)
 geography *volume 5 page 97*
 map and globe *volume 8 page 49*

political party
 MAIN ARTICLE *volume 10 page 114, picture, volume 10 page 114*

MORE TO EXPLORE
 government *volume 5 page 131*
 United States electoral college *volume 4 page 119*

political system: *see in index* communism; fascism; government; socialism

politics: *see in index* political system

Polk, James K. (president of the U.S.)
 MAIN ARTICLE *volume 10 page 114, picture, volume 10 page 115*
 MORE TO EXPLORE
 timeline *volume 10 page 114*

pollen (botany)
 MAIN ARTICLE *volume 10 page 116*
 MORE TO EXPLORE
 bee *volume 2 page 46*
 butterfly and moth *volume 2 page 158*
 flower *volume 5 page 38*
 images
 cross-pollination *picture, volume 10 page 117*
 self-pollination *picture, volume 10 page 116*
 insects *volume 6 page 140*

pollex (anatomy): *see in index* thumb

pollination
 bee *volume 2 page 46*
 flower *volume 5 page 38*
 pollen *volume 10 page 116*

polling place (election)
 voting *volume 14 page 105*

Pollock, Jackson (U.S. artist)
 painting *volume 10 page 11*

pollution (environment)
 MAIN ARTICLE *volume 10 page 117*
 MORE TO EXPLORE

acid rain *volume 1 page 18*
 coal *volume 3 page 145*
 dew *volume 4 page 42*
 human disease *volume 4 page 57*
 oceans and seas *volume 9 page 118*
 Pacific Ocean *volume 10 page 5*

pollywog (animal stage): *see in index* tadpole

Polo, Marco (Italian explorer)
 MAIN ARTICLE *volume 10 page 119*
 MORE TO EXPLORE

exploration *volume 4 page 174*

Pol Pot (Cambodian political leader)
 Cambodia *volume 3 page 18*

Poltoratsk (capital city of Turkmenistan):
see in index Ashgabat

polyester cloth (artificial fiber)
 production *picture, volume 13 page 28*

polygamy (marriage)
 Mormons *volume 8 page 182*
 Utah *volume 14 page 45*

polygon (mathematics)
 geometry *volume 5 page 98*

Polynesia (region, Oceania)
 Oceania *volume 9 page 120*

Polynesian (people)
 Hawaii *volume 6 page 27*
 mythology *volume 8 page 223*
 Samoa *volume 12 page 24*

polyp (zoology)
 coral *volume 3 page 197*

Polyporaceae (fungus family): *see in index* bracket fungus

Pomeranian (breed of dog)
 toy dogs *table, volume 4 page 62*

pommel horse (gymnastics)
 gymnastics *volume 5 page 174, picture, volume 5 page 175*

Pomo (Native American people)
 MAIN ARTICLE *volume 10 page 120, picture, volume 10 page 120*

Pompeii (ancient city in Italy)

MAIN ARTICLE *volume 10 page 120, picture, volume 10 page 121*

MORE TO EXPLORE

Mount Vesuvius *volume 14 page 73, picture, volume 14 page 73*

Pompey (Roman statesman): *see in index*
Pompey the Great

Pompey's Pillar (monument in Alexandria, Egypt) *picture, volume 1 page 75*

Pompey the Great (Roman statesman)
Caesar *volume 3 page 8*

Ponca (Native American people)

MAIN ARTICLE *volume 10 page 121*

MORE TO EXPLORE

Osage *volume 9 page 152*

Standing Bear, Ponca chief *picture, volume 10 page 122*

Ponce de León, Juan (Spanish explorer)
MAIN ARTICLE *volume 10 page 122, picture, volume 10 page 122*

MORE TO EXPLORE

United States

Florida *volume 5 page 35*

Saint Augustine *volume 12 page 10*

Puerto Rico

San Juan *volume 12 page 28*

Pongal (Hindu festival) *picture, volume 6 page 125*

Pont du Gard (Roman aqueduct bridge in southern France) *picture, volume 2 page 131*

Pontiac (Ottawa chief)

MAIN ARTICLE *volume 10 page 123, picture, volume 10 page 123*

Pontiac's War (North American history)
Pontiac *volume 10 page 123*

pony (small horse) *picture, volume 6 page 86*
horse *volume 6 page 86*

Pony Express (U.S. history)

MAIN ARTICLE *volume 10 page 123*

MORE TO EXPLORE

postal service *volume 10 page 137*

poodle (breed of dog)

non-sporting dogs *table, volume 4 page 62*

pooja (Hinduism): *see in index* puja

poojah (Hinduism): *see in index* puja

"Poor Richard's" (U.S. almanac)

Franklin *volume 5 page 63*

pop art (artistic style)

painting *volume 10 page 12*

Warhol *volume 15 page 11*

pope (Roman Catholicism)

MAIN ARTICLE *volume 10 page 125, picture, volume 10 page 125*

MORE TO EXPLORE

Italy *volume 6 page 173*

Rome *volume 11 page 87*

Roman Catholicism *volume 11 page 82*

Vatican City *volume 14 page 59*

Popé (Tewa Pueblo leader)

Pueblo Indians *volume 10 page 164*

poplar (tree)

MAIN ARTICLE *volume 10 page 126, picture, volume 10 page 126*

pop music: *see in index* popular music

poppy (plant and flower)

MAIN ARTICLE *volume 10 page 126*

MORE TO EXPLORE

California poppies *picture, volume 10 page 126*

poppy seed (spice)

poppy *volume 10 page 127*

Popular Movement for the Liberation of Angola (political organization in Angola)

Angola *volume 1 page 123*

popular music

MAIN ARTICLE *volume 10 page 127, picture, volume 10 page 127*

MORE TO EXPLORE

folk music *volume 5 page 41*

music *volume 8 page 214*

popular vote (elections)

electoral college *volume 4 page 119*

population (human)

extinct animals *volume 1 page 126*

Tokyo *picture, volume 3 page 124*

population census: *see in index* census

Poquelin, Jean-Baptiste (French playwright): *see in index* Molière

porcelain (ceramics)

porcelain vases *picture, volume 10 page 139*

pottery *volume 10 page 139*

porcupine (rodent)

MAIN ARTICLE *volume 10 page 128, picture, volume 10 page 128*

MORE TO EXPLORE

tail *volume 13 page 7*

pore (anatomy)

acne *volume 1 page 19*

Porifera (animal): *see in index* sponge

porphyria (disease)

George III *volume 5 page 100*

porpoise (mammal)

MAIN ARTICLE *volume 10 page 129*

MORE TO EXPLORE

dolphin *volume 4 page 64*

harbor porpoise *picture, volume 10 page 129*

Porro prism (optics)

binocular *picture, volume 2 page 72*

port (harbor settlement)

harbor *volume 6 page 17*

port (nautical term)

boat *volume 2 page 97, picture, volume 2 page 97*

Port Arthur (inlet in Tasmania, Australia)
picture, volume 13 page 20

Port-au-Prince (capital city of Haiti)

MAIN ARTICLE *volume 10 page 129*

MORE TO EXPLORE

Haiti *volume 6 page 8*

parade *picture, volume 10 page 130*

portcullis (grate)

castle *volume 3 page 52*

Portland (city in Maine, U.S.)

Maine *volume 8 page 23*

Portland (city in Oregon, U.S.) *picture, volume 9 page 148*

Port Louis (capital city of Mauritius)

MAIN ARTICLE *volume 10 page 130, picture, volume 10 page 130*

MORE TO EXPLORE

Mauritius *volume 8 page 80*

Port Moresby (capital city of Papua New Guinea)

MAIN ARTICLE *volume 10 page 131, picture, volume 10 page 131*

MORE TO EXPLORE

Papua New Guinea *volume 10 page 29*

Port Nicholson (bay and harbor of Wellington, New Zealand)
Wellington *volume 15 page 28*

Port of Spain (capital city of Trinidad and Tobago)

MAIN ARTICLE *volume 10 page 131*

MORE TO EXPLORE

president's house *picture, volume 10 page 132*

Trinidad and Tobago *volume 13 page 97*

portolan (navigational chart)

Venice and Genoa *map, volume 3 page 126*

Porto-Novo (capital city of Benin)

MAIN ARTICLE *volume 10 page 132*

MORE TO EXPLORE

Benin *volume 2 page 60*

Porto Novo (town in Cape Verde) *picture, volume 3 page 33*

portrait (art)

painting *volume 10 page 7*

Warhol *volume 15 page 11*

Port Stanley (capital of Falkland Islands, United Kingdom): *see in index Stanley*

Portugal (country in Europe)

MAIN ARTICLE *volume 10 page 133*

MORE TO EXPLORE

arts

folk dance *picture, volume 10 page 134*

tile decoration *picture, volume 2 page 129*

geography

limestone cliffs *picture, volume 7 page 153*

seacoast *picture, volume 10 page 133*

history

Africa

Angola *volume 1 page 123, volume 7 page 183*

Gabon *volume 5 page 78*

Ghana *volume 5 page 111*

Guinea *volume 5 page 169*

Guinea-Bissau *volume 2 page 83, volume 5 page 170*

Monomotapa *volume 8 page 169*

Mozambique *volume 8 page 200*

São Tomé and Príncipe *volume 12 page 35, volume 12 page 36*

Sierra Leone *volume 12 page 85*

Wolof Empire *volume 15 page 55*

Americas

Brazil *volume 2 page 127, volume 11 page 67, volume 12 page 35*

exploration and settlement *volume 1 page 102*

Uruguay *volume 14 page 43*

Asia

Dili *volume 4 page 49*

East Timor *volume 4 page 96*

Malaysia *volume 8 page 28*

Mumbai *volume 8 page 204*

Gama *volume 5 page 83*

Muscat *volume 8 page 207*

Portuguese (people)

Macau *volume 8 page 4*

Port Vila (capital city of Vanuatu): *see in index Vila*

Poseidon (Greek god)

MAIN ARTICLE *volume 10 page 135, picture, volume 10 page 135*

MORE TO EXPLORE

ancient Greek mosaic *picture, volume 5 page 155*

Athena *volume 1 page 218*

Hades *volume 6 page 5*

position (ballet)

ballet *volume 2 page 13, picture, volume 2 page 14*

positive ion (chemistry and physics)

atoms *volume 1 page 225*

positive number (mathematics): *see in index natural number*

possum (marsupial): *see in index opossum*

postage stamp: *see in index stamp*

postal service

MAIN ARTICLE *volume 10 page 136, picture, volume 10 page 136, picture, volume 10 page 136*

MORE TO EXPLORE

Pony Express *volume 10 page 123*

stamp *volume 12 page 177*

postal worker

postal service *volume 10 page 136*

poster (art and advertisement)

Federal Art Project poster *picture, volume 9 page 44*

war bonds poster *picture, volume 13 page 118*

postimpressionism (art)

painting *volume 10 page 10*

postmark

postal service *volume 10 page 136*

post meridiem (time)

common abbreviations *table, volume 1 page 8*

postmodernism (art)

architecture *volume 1 page 172*

post office

postal service *volume 10 page 136*

postsecondary education: *see in index higher education*

Potala Palace (Lhasa, Tibet, China) *picture, volume 13 page 62*

potassium (chemical element)

date *volume 4 page 18*

potato (plant and edible root)

MAIN ARTICLE *volume 10 page 137, picture, volume 10 page 137*

MORE TO EXPLORE

potato gardening *picture, volume 2 page 115*

vegetable *volume 14 page 61*

potato famine (European history)

potato *volume 10 page 138*

Potawatomi (Native American people)

MAIN ARTICLE *volume 10 page 138, picture, volume 10 page 138*

potential energy (physics)

energy *volume 4 page 137*

potlatch (North American Indian custom)

Kwakiutl *volume 7 page 92*

Nootka *volume 9 page 77*

Potter, Harry (fictional character)

Rowling *volume 11 page 99*

potter's wheel

clay *volume 3 page 133*

pottery *volume 10 page 139*

man in India making pottery *picture, volume 10 page 140*

potter wasp (insect) *picture, volume 15 page 21*

pottery

MAIN ARTICLE *volume 10 page 138*

MORE TO EXPLORE

clay *volume 3 page 133*

images

Chinese porcelain vases *picture, volume 10 page 139*
 man in India making pottery *picture, volume 10 page 140*
 Minoan pottery *picture, volume 10 page 139*
 Zuni potter making a pot from clay *picture, volume 15 page 110*

pottery wheel (tool): *see in index* potter's wheel

poultry (agriculture)
 MAIN ARTICLE *volume 10 page 140, picture, volume 10 page 140*

poverty
 aging *volume 1 page 47*

POW (international law): *see in index* prisoner of war

powder (cosmetic)
 cosmetics *volume 3 page 202*

Powell, Colin (U.S. statesman and military officer)
 MAIN ARTICLE *volume 10 page 141, picture, volume 10 page 141*
 MORE TO EXPLORE
 African Americans *volume 1 page 45*

power (political and social science)
 colony *volume 3 page 155*

Power, Night of (Islam): *see in index* Night of Power

powerboat (watercraft): *see in index* motorboat

power plant (generating station)
 nuclear energy *volume 9 page 105*

Powers, Abigail (first lady of the U.S.): *see in index* Fillmore, Abigail

powers, separation of (political science and government)
 United States Constitution *volume 14 page 32*

power station (generating plant): *see in index* power plant

power train (construction)
 automobile *volume 1 page 236*

Powhatan (U.S. Indian chief)
 Pocahontas *volume 10 page 103*

Powhatan Confederacy (U.S. Indian alliance)
 Jamestown *volume 7 page 11*

Virginia *volume 14 page 95*

Prado, Edgar (U.S. jockey)
 2006 Kentucky Derby *picture, volume 6 page 87*

Prado Museum (museum in Madrid, Spain)
 Madrid *volume 8 page 13*

Prague (capital city of the Czech Republic)
 MAIN ARTICLE *volume 10 page 141, picture, volume 3 page 240, picture, volume 10 page 142*

MORE TO EXPLORE
 Czechoslovakia *volume 3 page 238*
 Czech Republic *volume 3 page 239*

Prague Castle (castle in Prague, Czech Republic): *see in index* Hradcany, castle of

Praha (capital city of the Czech Republic): *see in index* Prague

Praia (capital city of Cape Verde)
 MAIN ARTICLE *volume 10 page 142*
 MORE TO EXPLORE
 Cape Verde *volume 3 page 33*

prairie (ecological region)
 North American grassland *picture, volume 5 page 143*
 United States prairie land *picture, volume 14 page 26*

Prairie, Gros Ventres of the (Native American people): *see in index* Gros Ventre

Prairie Band (Native American people)
 Potawatomi *volume 10 page 138*

prairie dog (rodent)
 MAIN ARTICLE *volume 10 page 143, picture, volume 10 page 143*

Prairie school (architectural style)
 architecture *volume 1 page 172*
 Wright *volume 15 page 75*

Prairie State (state in the U.S.): *see in index* Illinois

Prairie style (architectural style): *see in index* Prairie school

prairie wolf (mammal): *see in index* coyote

prayer
 Dalai Lama *picture, volume 4 page 7*

Praying Indians (North American Indian group)
 Massachuset *volume 8 page 70*

preadolescence (growth stage): *see in index* preteen

Precambrian time (prehistoric time period)
 geology *volume 5 page 97*
 prehistoric life *volume 10 page 144, table, volume 10 page 145*

precious stone (mineral): *see in index* gemstone

precipitation (weather)
 weather *volume 15 page 27*

preen gland (bird anatomy)
 swan *volume 12 page 210*

pregnancy (physiology)
 gestation *volume 5 page 109*
 pregnancy and fetus development *picture, volume 11 page 49, picture, volume 11 page 50*
 reproductive system *volume 11 page 49*
 rubella *volume 11 page 100*

prehistoric art
 sculpture *volume 12 page 56*

prehistoric life
 MAIN ARTICLE *volume 10 page 144*
 MORE TO EXPLORE
 life-forms and time periods *table, volume 10 page 145*

prehistoric peoples
 cave *volume 3 page 64*
 Stone Age *volume 12 page 188*

premier (government official): *see in index* prime minister

premolar (tooth): *see in index* bicuspid

Presbyterian churches (Christianity)
 Protestantism *volume 10 page 158*

preschool age (growth stage)
 child development *volume 3 page 97*

prescription (physiology)
 drug *volume 4 page 78*

presidency of the United States of America (U.S. government) *table, volume 14 page 30*
 Bush, George W. *volume 2 page 155*
 Cleveland *volume 3 page 136*
 Clinton *volume 3 page 138*

electoral college *volume 4 page 119*
 2000 election vote certificate *picture, volume 4 page 119*
 Ford *volume 5 page 51*
 Hayes *volume 6 page 29*
 Oval Office *picture, volume 14 page 34*

*For more about U.S. presidents
 look for these articles:*

Adams, John	Johnson,
Adams, John Quincy	Andrew Johnson,
Arthur, Chester	Lyndon B. Kennedy,
Buchanan, James	John F. Lincoln,
Bush, George	Abraham Lincoln,
Bush, George W.	Madison, James
Carter, Jimmy	McKinley, William
Cleveland, Grover	Monroe, James
Clinton, Bill	Nixon, Richard M.
Coolidge, Calvin	Obama, Barack
Eisenhower, Dwight D.	Pierce, Franklin
Fillmore, Millard	Polk, James K.
Ford, Gerald R.	Reagan, Ronald W.
Garfield, James A.	Roosevelt, Franklin D.
Grant, Ulysses S.	Roosevelt, Theodore
Harding, Warren G.	Taft, William Howard
Harrison, Benjamin	Taylor, Zachary
Harrison, William Henry	Truman, Harry S.
Hayes, Rutherford B.	Tyler, John
Hoover, Herbert	Van Buren, Martin
Jackson, Andrew	Washington, George
Jefferson, Thomas	Wilson, Woodrow

president (government official)
 government *volume 5 page 132*
 republic *volume 11 page 53*
 United States government *volume 14 page 34*

president of the Senate (U.S. government)
 United States government *volume 14 page 33*

president of the United States of America (U.S. government): *see in index* presidency of the United States of America

president pro tempore (U.S. government)
 United States government *volume 14 page 33*

Presley, Elvis (U.S. singer)
 MAIN ARTICLE *volume 10 page 146, picture, volume 10 page 147*

MORE TO EXPLORE
 rock *volume 11 page 78*

press, the (communications): *see in index* newspaper

press association (journalism): *see in index* news service

preteen (growth stage)
 child development *volume 3 page 97*

Pretoria (executive capital city of South Africa)
 MAIN ARTICLE *volume 10 page 147, picture, volume 10 page 148*

MORE TO EXPLORE
 South Africa *volume 12 page 137*

Pretorius, Andries (Boer South African leader)
 Pretoria *volume 10 page 148*

PRI (political party in Mexico): *see in index* Institutional Revolutionary Party

price (economic force)
 economics *volume 4 page 100*

pricing (economic force): *see in index* price

prickly pear (cactus) *picture, volume 3 page 6*
 cactus *volume 3 page 6*

pride (animal behavior)
 lion *volume 7 page 158*

priest (Christianity)
 Eastern Orthodox priest *picture, volume 8 page 137*
 Greek Orthodox priests *picture, volume 3 page 113*
 Roman Catholic priest *picture, volume 11 page 82*

priest (religion)
 Zoroastrian priest *picture, volume 15 page 109*

primary battery (electronics)
 battery *volume 2 page 40*

primary bow (multicolored arc in the sky)
 rainbow *volume 11 page 23, picture, volume 11 page 22*

primary color (optics)
 color *volume 3 page 156*
 light *picture, volume 3 page 155*
 pigment *picture, volume 3 page 156*

primary consumer (biology)
 food chain *volume 5 page 45*

primary education: *see in index* elementary education

primary hue (optics): *see in index* primary color

primary phloem (plant tissue)
 root *picture, volume 11 page 96*

primary rainbow (multicolored arc in the sky): *see in index* primary bow

primary school: *see in index* elementary education

primary tooth (anatomy)
 teeth *volume 13 page 30, picture, volume 13 page 31*

primary xylem (plant tissue)
 root *picture, volume 11 page 96*

primate (mammal)
 MAIN ARTICLE *volume 10 page 148, picture, volume 10 page 149*

MORE TO EXPLORE
 arm *volume 1 page 182*
 hand *volume 6 page 12*

prime meridian (geography): *see in index* Greenwich meridian

prime minister (government official)
 government *volume 5 page 132*
 Parliament *volume 10 page 37*

Prince Edward Island (island province in Canada)
 MAIN ARTICLE *volume 10 page 150*
 MORE TO EXPLORE
 Confederation Bridge *picture, volume 10 page 151*
 East Point *picture, volume 10 page 150*

Prince Rupert's Land (historical region in Canada): *see in index* Rupert's Land

Princeton, Battle of (U.S. War of Independence): *see in index* Trenton and Princeton, Battles of

Princeton University (university in Princeton, New Jersey, U.S.)
football *volume 5 page 50*

Principality of Liechtenstein (country in Europe): *see in index* Liechtenstein

printing (publishing)

MAIN ARTICLE *volume 10 page 152, picture, volume 10 page 152, picture, volume 10 page 152*

MORE TO EXPLORE

Gutenberg *volume 5 page 172*

Gutenberg Bible *picture, volume 5 page 172*

Middle Ages *volume 8 page 123*

printing plate (printing): *see in index* plate

printing press (publishing)

advertising *volume 1 page 32*

book and bookmaking *volume 2 page 109*

Gutenberg *volume 5 page 172*

literature *volume 7 page 162*

newspaper *volume 9 page 55, picture, volume 10 page 152*

printing *volume 10 page 153*

Renaissance *volume 11 page 45*

technology and invention *volume 13 page 26*

writing *volume 15 page 77*

prion (infectious protein agent)

animal disease *volume 4 page 55*

prism (optics)

MAIN ARTICLE *volume 10 page 153, picture, volume 10 page 153*

MORE TO EXPLORE

binoculars *volume 2 page 72, picture, volume 2 page 72*

color *volume 3 page 156*

light *volume 7 page 148*

Newton *volume 9 page 56, picture, volume 9 page 55*

prison

MAIN ARTICLE *volume 10 page 154, picture, volume 10 page 154*

MORE TO EXPLORE

prison fence and towers *picture, volume 3 page 216*

prison colony: *see in index* penal colony

prisoner of war (international law)

ocean liner *picture, volume 13 page 93*

prison reform

prison *volume 10 page 154*

Pristina (capital city of Kosovo)

MAIN ARTICLE *volume 10 page 155*

private (military rank)

army *volume 1 page 189*

private enterprise economy (economic system): *see in index* capitalism

privateer (ship)

pirate *volume 10 page 89*

prizefighting (sport): *see in index* boxing

proboscis (anatomy)

mosquito *volume 8 page 189*

Process of National Reorganization

(Argentine history): *see in index* Dirty War

proconsul (ancient Roman official)

ancient Rome *volume 11 page 90*

Procyon lotor (mammal): *see in index*

North American raccoon

producer (biology)

ecosystem *volume 4 page 101*

food chain *volume 5 page 45*

producing (theater and movies)

movie *volume 8 page 198*

theater *volume 13 page 57*

product (things of economic utility): *see in index* goods

production (economic process)

economics *volume 4 page 100*

production design: *see in index* set design

production line (industry): *see in index*

assembly line

professional sports

sports *volume 12 page 168*

“Profiles in Courage” (work by

Kennedy)

Kennedy *volume 7 page 54*

profit (economic reward)

economics *volume 4 page 100*

program, computer: *see in index* computer program

programming: *see in index* computer program

programming language: *see in index* computer programming language

progressive muscular dystrophy (muscle disease): *see in index* muscular dystrophy

Progressive Party (U.S. political party, 1912)

Roosevelt *volume 11 page 95*

Taft *volume 13 page 5*

proletariat (social class)

communism *volume 3 page 168*

Prometheus (Greek god)

MAIN ARTICLE *volume 10 page 155, picture, volume 10 page 156*

MORE TO EXPLORE

Pandora *volume 10 page 26*

Titans *volume 13 page 71*

proof (law): *see in index* evidence

propeller (vehicle part)

ship *volume 12 page 82*

property master (theater)

theater *volume 13 page 58*

property tax

tax *volume 13 page 21*

Prophets (biblical text)

Bible *volume 2 page 67*

Propontis (inland sea in Turkey): *see in index* Marmara, Sea of

propulsion (physics): *see in index* thrust

propulsive force (physics): *see in index* thrust

proscenium stage (theater)

theater *volume 13 page 57*

prose (literature)

literature *volume 7 page 160*

prostate gland (anatomy)

human reproductive system *picture, volume 11 page 47*

protectionism (economics): *see in index* trade limit

protection system: *see in index* security and protection system

protective coloration (biology)MAIN ARTICLE *volume 10 page 156*

MORE TO EXPLORE

- chameleon *volume 3 page 80*
- insect *volume 6 page 139*
- lizard *volume 7 page 170*
- toad *picture, volume 10 page 157*

protein (biochemistry)

- bean *volume 2 page 40*
- DNA *volume 4 page 60*
- food and nutrition *volume 5 page 43*

Protestantism (Christianity)MAIN ARTICLE *volume 10 page 157*

MORE TO EXPLORE

- beliefs and practices
 - Bible *volume 2 page 67*
 - church *volume 3 page 117, picture, volume 3 page 113*
 - female ministers *picture, volume 10 page 157*
- Christianity *volume 3 page 112*
- Europe *volume 4 page 162*
- history
 - Calvin *volume 3 page 16, picture, volume 3 page 16*
 - Elizabeth I *volume 4 page 125*
 - France *volume 5 page 60*
 - Holy Roman Empire *volume 6 page 75*
 - Huguenots *volume 6 page 92*
 - Northern Ireland *volume 9 page 90*
 - Reformation *volume 11 page 38*
 - North America *volume 9 page 81*

Protestant Reformation (Christianity):*see in index* Reformation**protests:** *see in index* demonstrations and protests**protist** (biology)MAIN ARTICLE *volume 10 page 158*

MORE TO EXPLORE

- algae *volume 1 page 76*
- classification *picture, volume 7 page 168*
- living thing *volume 7 page 169*
- prehistoric life *volume 10 page 144*
- slime mold *picture, volume 10 page 158*

Protoceratops (dinosaur)

- dinosaurs in scale *picture, volume 4 page 53*

protocist (biology): *see in index* protist**proton** (subatomic particle)

- atom *volume 1 page 224, picture, volume 1 page 225*
- electricity *volume 4 page 120*

protozoan (microorganism)MAIN ARTICLE *volume 10 page 159*

MORE TO EXPLORE

- fossil *picture, volume 10 page 159*
- human disease *volume 4 page 56*
- malaria *volume 8 page 25*
- parasite *volume 10 page 33*
- species on earth *picture, volume 7 page 167*

Providence (city in Maryland, U.S.): *see in index* Annapolis**Providence** (state capital of Rhode Island, U.S.)MAIN ARTICLE *volume 10 page 160, picture, volume 10 page 160*

MORE TO EXPLORE

- Rhode Island *volume 11 page 60*

Provisional Irish Republican Army(Irish military organization): *see in index* Irish Republican Army**Prussia** (region in Europe)MAIN ARTICLE *volume 10 page 161*

MORE TO EXPLORE

- Frederick the Great *volume 5 page 64*
- Germany *volume 5 page 106*
- Poland *volume 10 page 108*

Prydain Chronicles (novels by Alexander)

- Alexander *volume 1 page 74*

Przewalski's horse (mammal) *picture,*

- volume 6 page 86*
- evolution *picture, volume 4 page 170*
- horse *volume 6 page 86*

Psalms (biblical text)

- Bible *volume 2 page 67*

pseudopod (protozoan cell behavior)

- amoeba *volume 1 page 108*

Psittacosaurus (dinosaur)

- dinosaurs in scale *picture, volume 4 page 53*
- mouth structure *picture, volume 4 page 51*

psychiatric disorder: *see in index* mental illness**psychiatry**

- mental illness *volume 8 page 101*

psychology (science)MAIN ARTICLE *volume 10 page 162, picture, volume 10 page 162***psychomotor learning** (motor development)

- child development *volume 3 page 97*

psychotherapy (psychology)

- mental illness *volume 8 page 101*

psychotic disorder (psychology)

- mental illness *volume 8 page 100*

pterodactyl (prehistoric reptile)MAIN ARTICLE *volume 10 page 163*

MORE TO EXPLORE

- fossil skeleton *picture, volume 10 page 163*

Ptolemies (ancient Egyptian rulers)

- ancient Egypt *volume 4 page 115*

Ptolemy I Soter (Macedonian king of Egypt)

- Alexandria *volume 1 page 75*
- ancient Egypt *volume 4 page 115*

Ptolemy XIII (Macedonian king of Egypt)

- Cleopatra *volume 3 page 134*

Ptolemy XIV (Macedonian king of Egypt)

- Cleopatra *volume 3 page 134*

Ptolemy (Egyptian scientist)

- astronomy *volume 1 page 215*

ptomaine poisoning: *see in index* food poisoning**puberty** (stage of growth)

- acne *volume 1 page 18*

public aquarium: *see in index* aquarium**public assistance:** *see in index* social welfare program**public education**

- education *volume 4 page 106*

Public Enemy (U.S. rap group)

- rap *volume 11 page 27*

public healthMAIN ARTICLE *volume 10 page 163, picture, volume 10 page 164***public library**

- images
 - boy in a library *picture, volume 7 page 141*
 - librarian with students *picture, volume 7 page 142*
- library *volume 7 page 142*

public school system: *see in index* public education

public transportation
elevated railway *picture, volume 13 page 92*

publishing: *see in index* book; cartoon; magazine; map; printing; writing

puck (ice hockey equipment)
ice hockey *volume 6 page 67*

puhu (mammal)
deer *volume 4 page 26*

Puebla, Battle of (Mexican-French history)
Cinco de Mayo *volume 3 page 119*

Pueblo de la Reyna de los Angeles, El (city in California, U.S.): *see in index* Los Angeles

Pueblo Indians (Native American people)
MAIN ARTICLE *volume 10 page 164*
MORE TO EXPLORE
adobe *volume 1 page 30*
Anasazi *volume 1 page 114*
Native Americans *volume 9 page 17*
Navajo *volume 9 page 23*
Zuni adobe houses *picture, volume 10 page 164*

Puerto Rican (people)
Hispanic Americans *volume 6 page 61*

Puerto Rico (Caribbean island commonwealth of the U.S.)
MAIN ARTICLE *volume 10 page 165, picture, volume 10 page 165*
MORE TO EXPLORE
Ponce de León *volume 10 page 122*

Puerto Rico Trench (submarine depression, Atlantic Ocean)
Atlantic Ocean *volume 1 page 220*

puffin (bird): *see in index* Atlantic puffin

pug (breed of dog)
toy dogs *table, volume 4 page 62*

pugilism (sport): *see in index* boxing

puja (Hinduism)
Hinduism *volume 6 page 56*

Pulaski, Casimir (Polish patriot and U.S. army officer)
MAIN ARTICLE *volume 10 page 166, picture, volume 10 page 166*

Pulaski Legion (U.S. military unit)
Pulaski *volume 10 page 166*

pulley (mechanics)
machine *volume 8 page 6, picture, volume 8 page 6*

Pullman Strike (U.S. history)
Cleveland *volume 3 page 136*

pulmonary circulation (physiology)
cardiovascular system *volume 3 page 39*

pulp (tooth)
teeth *volume 13 page 31*

pulp (wood): *see in index* wood pulp

puma (mammal)
MAIN ARTICLE *volume 10 page 167, picture, volume 10 page 167*

pummelo (fruit): *see in index* shaddock

pumper truck (fire truck)
firefighting *volume 5 page 26*

pumpkin (plant and food)
MAIN ARTICLE *volume 10 page 167, picture, volume 10 page 167*

pump truck (fire truck): *see in index* pumper truck

punched card (data processor)
computer *volume 3 page 174*

Punic Wars (Roman history, 264-146 BC)
ancient Rome *volume 11 page 90*
Carthage *volume 3 page 48*

punishment (law)
law *volume 7 page 117*
prison *volume 10 page 154*

Punjab (state in India)
Sikhism *volume 12 page 87*

Punjab (province in Pakistan)
Indus River *volume 6 page 132*

Punjabi (people)
Pakistan *volume 10 page 13*

Punta del Este (town in Uruguay) *picture, volume 14 page 43*

Puntland (region in Africa)
Somalia *volume 12 page 131*

pupa (biology)
butterfly and moth *volume 2 page 158*
Monarch butterfly *picture, volume 2 page 158*

flea *volume 5 page 33*
insect *volume 6 page 140*
metamorphosis *volume 8 page 107*
mosquito *volume 8 page 189*

pupil (part of eye)
eye *volume 4 page 176, picture, volume 4 page 175*

puppet
Bunraku *picture, volume 13 page 59*
California condor chick *picture, volume 15 page 108*
Muppets *picture, volume 6 page 40*

puppetry: *see in index* puppet

pure democracy (form of government): *see in index* direct democracy

pure math (mathematics)
mathematics *volume 8 page 77*
student studying arithmetic *picture, volume 8 page 77*

Purim (Judaism)
MAIN ARTICLE *volume 10 page 168, picture, volume 10 page 168*

Puritanism (Christianity): *see in index* Puritans

Puritans (religious group)
MAIN ARTICLE *volume 10 page 168, picture, volume 10 page 169*
MORE TO EXPLORE
Massachusetts Bay Colony *volume 8 page 74*
“Mayflower” *volume 8 page 83*
Plymouth Colony *volume 10 page 102*
Salem witch trials *volume 12 page 20*

purple pitcher plant (plant)
pitcher plant *volume 10 page 90*

purring (cat behavior)
cat *volume 3 page 58*

pursuit (bicycle race)
cycling *volume 3 page 235*

PUSH, Operation (U.S. organization)
Jackson *volume 7 page 7*

pusy willow (plant)
willow *volume 15 page 45*

putsch (politics): *see in index* rebellion

putter (golf club)
golf *volume 5 page 125*

Pygmy (people)
Gabon *volume 5 page 78*

pygmy hippopotamus (mammal)
hippopotamus *volume 6 page 60*

pygmy marmoset (primate)
monkey *volume 8 page 167*

pygmy pine (tree)
conifer *volume 3 page 182*

Pyongyang (capital city of North Korea)
MAIN ARTICLE *volume 10 page 169*, *picture, volume 10 page 170*

MORE TO EXPLORE
festival *picture, volume 7 page 80*
North Korea *volume 7 page 79*

pyramid (architecture)
MAIN ARTICLE *volume 10 page 170*
MORE TO EXPLORE
ancient Egypt *volume 4 page 114*
Pyramids of Giza *picture, volume 4 page 110*, *picture, volume 10 page 170*
Saqqarah, Egypt *picture, volume 1 page 168*

Pyramids of Giza (pyramids in Egypt)
picture, volume 4 page 110, *picture, volume 10 page 170*
architecture *volume 1 page 168*

Pyrenees (mountain range in Europe)
MAIN ARTICLE *volume 10 page 171*, *picture, volume 10 page 171*
MORE TO EXPLORE
Spain *picture, volume 12 page 153*

pyrexia (medical disorder): *see in index* fever

Pytheas (ancient Greek explorer)
polar exploration *volume 10 page 110*

Python (Greek mythology)
Apollo *volume 1 page 150*

python (snake)
MAIN ARTICLE *volume 10 page 172*
MORE TO EXPLORE
green tree python *picture, volume 10 page 172*
snake *volume 12 page 112*



Qaddafi, Muammar al- (Libyan statesman)
Libya *volume 7 page 145*

Qaeda, al- (international terrorist network)
bin Laden *volume 2 page 71*
Bush *volume 2 page 157*
terrorism *volume 13 page 49*
United States *volume 14 page 31*

Qahirah, Al- (city in Egypt): *see in index* Cairo

Qahtan (Arab legendary figure)
Arabs *volume 1 page 159*

Qa'idah, al- (international terrorist network): *see in index* Qaeda, al-

Qajar Dynasty (Iranian dynasty)
Iran *volume 6 page 149*

Qatar (country in the Middle East)
MAIN ARTICLE *volume 11 page 4*, *picture, volume 11 page 4*
MORE TO EXPLORE
Doha *picture, volume 4 page 64*

Qibli misr (region of the Nile Valley in Africa): *see in index* Upper Egypt

Qin Dynasty (Chinese history, 221-206 BC)
China *volume 3 page 103*

Qing Dynasty (Chinese history, 1644-1911)
China *volume 3 page 103*
Mongolia *volume 8 page 164*
Taiwan *volume 13 page 9*

Quadracci Pavilion (building in Milwaukee, Wisconsin, U.S.) *picture, volume 15 page 53*

quadrilateral (mathematics)
geometry *volume 5 page 98*

Quakerism (religion): *see in index* Quakers

Quakers (religious group)
MAIN ARTICLE *volume 11 page 5*
MORE TO EXPLORE

meeting *picture, volume 11 page 5*
Penn *volume 10 page 54*
Pennsylvania *volume 10 page 56*
Underground Railroad *volume 14 page 9*

quaking aspen (tree) *picture, volume 1 page 210*
aspen *volume 1 page 210*

quality of sound (sound): *see in index* timbre

Quapaw (Native American people)
MAIN ARTICLE *volume 11 page 6*
MORE TO EXPLORE
Osage *volume 9 page 152*
Quapaw sash *picture, volume 11 page 6*

quark (subatomic particle)
atom *volume 1 page 224*

quarrying (mining)
MAIN ARTICLE *volume 11 page 6*, *picture, volume 11 page 7*
MORE TO EXPLORE
machine-cut limestone blocks *picture, volume 7 page 153*, *picture, volume 11 page 7*

Quarrymen (British rock group): *see in index* Beatles, the

quarterback (sports)
football *volume 5 page 49*

quartz (mineral)
crystal *volume 3 page 226*, *picture, volume 3 page 226*

Qudwah al-Husayni, Muhammad 'Abd ar-Ra'uf al- (Palestinian leader): *see in index* Arafat, Yasir

Quebec (province in Canada)
MAIN ARTICLE *volume 11 page 8*
MORE TO EXPLORE
street signs *picture, volume 11 page 9*

Quebec (city in Quebec, Canada)
Champlain *volume 3 page 81*
Quebec province *volume 11 page 8*

Québécois (people): *see in index* French Canadian

quebracho (tree)
Paraguay *volume 10 page 30*

Quechua (Native American people)
Bolivia *volume 2 page 102*

queen (insect caste)
ants *volume 1 page 133*
bee *volume 2 page 46, picture, volume 2 page 46*
termite *volume 13 page 48*
wasp *volume 15 page 21*

Queen Latifah (U.S. rapper and actress)
hip-hop *volume 6 page 59*
rap *volume 11 page 26*

Queens (borough in New York City, New York, U.S.)
New York City *volume 9 page 60*

Queensland (state in Australia)
MAIN ARTICLE *volume 11 page 10, picture, volume 11 page 10*

Queenstown (city in New Zealand)
aerial view *picture, volume 9 page 62*

Queen's University (university in Belfast, Northern Ireland, United Kingdom)
picture, volume 2 page 53

quetzal (bird)
Guatemala *volume 5 page 166*

quill (bird anatomy)
feather *volume 5 page 8, picture, volume 5 page 8*

quill (in mammals)
porcupine *volume 10 page 128*

quill pig (rodent): *see in index* porcupine

quinceañera (Mexican celebration) *picture, volume 6 page 61*

Quincy Market (market in Boston, Massachusetts, U.S.) *picture, volume 2 page 114*

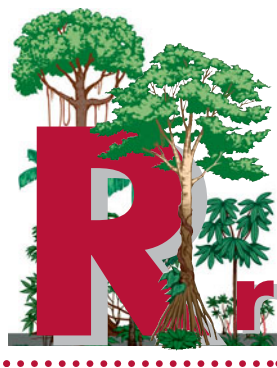
Quinnehtukqut (river in the U.S.): *see in index* Connecticut River

Quito (capital city of Ecuador)
MAIN ARTICLE *volume 11 page 11, picture, volume 11 page 11*
MORE TO EXPLORE
Ecuador *volume 4 page 102*

quiver (archery)
archery equipment *picture, volume 1 page 165*

Quivira (historical land in North America)
Coronado *volume 3 page 200*

Qur'an (sacred text of Islam): *see in index* Koran



Ra (Egyptian god)
MAIN ARTICLE *volume 11 page 30, picture, volume 11 page 31*
MORE TO EXPLORE
ancient Egypt *volume 4 page 113*

Rabat (capital city of Morocco)
MAIN ARTICLE *volume 11 page 13, picture, volume 11 page 13*
MORE TO EXPLORE
Morocco *volume 8 page 183*

rabbi (Judaism)
Judaism *volume 7 page 37*

rabbit (mammal)
MAIN ARTICLE *volume 11 page 13, picture, volume 11 page 14*

rabies (disease)
animal disease *volume 4 page 55*
Pasteur *volume 10 page 41*

raccoon (mammal)
MAIN ARTICLE *volume 11 page 14, picture, volume 11 page 15*

race (human)
anthropology *volume 1 page 141*

race (sport): *see in index* racing

race into space (world history): *see in index* space race

rachis (feather part)
feather *volume 5 page 8, picture, volume 5 page 8*

racial desegregation: *see in index* racial integration

racial discrimination (social practice and ideology): *see in index* racism

Racial Equality, Congress of (U.S. organization)

civil rights movement *volume 3 page 130*

racial integration

Arkansas *volume 1 page 181*
Little Rock *picture, volume 1 page 181*
Eisenhower *volume 4 page 118*
Robinson and baseball *volume 11 page 73*
Truman *volume 13 page 101*

racial prejudice (social practice and ideology): *see in index* racism

racial segregation: *see in index* segregation

racing (sport)

sailboats *picture, volume 5 page 147*
track and field *picture, volume 13 page 85*

racing bicycle (vehicle)

bicycle *volume 2 page 69*

racism (social practice and ideology)
anthropology *volume 1 page 141*
apartheid *volume 1 page 144*

racket (sports equipment)
tennis *volume 13 page 45*

radar (electronics)
MAIN ARTICLE *volume 11 page 15, picture, volume 11 page 16*
MORE TO EXPLORE
navigation *volume 9 page 24*
World War II *volume 15 page 67*

radiation (energy)

MAIN ARTICLE *volume 11 page 16*
MORE TO EXPLORE
burn and scald *volume 2 page 152*
cancer *volume 3 page 31*
heat *volume 6 page 32*
nuclear energy *volume 9 page 103*
radio *volume 11 page 19*
types of electromagnetic radiation *picture, volume 11 page 18*
wavelengths *picture, volume 11 page 17*

Radical Reconstruction (U.S. history)
Reconstruction *volume 11 page 34*

Radical Republican (U.S. history)
Reconstruction *volume 11 page 34*

radio (communication)
MAIN ARTICLE *volume 11 page 18, picture, volume 11 page 18, picture, volume 11 page 19*

MORE TO EXPLORE

navigation *volume 9 page 24*
 radiation *volume 11 page 17*
 telecommunication *volume 13 page 34*

radioactivity (physics)

Curie family *volume 3 page 232*
 radiation *volume 11 page 18*

radio antenna (physics): *see in index* radio wave**radiocarbon dating** (technology)
 archaeology *volume 1 page 163***radio telescope**

New Mexico *picture, volume 13 page 39*
 telescope *volume 13 page 39*

radio wave (physics)

Marconi *volume 8 page 53*
 radar *volume 11 page 15, picture, volume 11 page 16*
 radiation *volume 11 page 17*
 types of electromagnetic radiation
picture, volume 11 page 18
 radio *volume 11 page 18*
 radio telescope *picture, volume 13 page 39*
 telephone *volume 13 page 36*

Radisson, Pierre Esprit de (French explorer)
 fur trade *volume 5 page 76***radius** (bone)

arm *volume 1 page 182, picture, volume 1 page 182*

radula (mollusk anatomy)
 mollusk *volume 8 page 157***raft** (watercraft)

boat types *picture, volume 2 page 98*

Ragnarök (Norse mythology)
 Valhalla *volume 14 page 51***ragtime** (music)

jazz *volume 7 page 16*

railroad

MAIN ARTICLE *volume 11 page 20, picture, volume 11 page 20*

MORE TO EXPLORE

Cheyenne *volume 3 page 90*
 Denver *volume 4 page 39*
 “Dewit Clinton” steam locomotive
picture, volume 13 page 27

rain (weather)

MAIN ARTICLE *volume 11 page 21*

MORE TO EXPLORE

flood *volume 5 page 33*
 water *volume 15 page 24, picture, volume 15 page 23*

rainbow (weather)

MAIN ARTICLE *volume 11 page 22, picture, volume 11 page 22*

MORE TO EXPLORE

light *volume 7 page 148*

Rainbow/PUSH Coalition (U.S. organization)
 Jackson *volume 7 page 7***rainbow trout** (fish) *picture, volume 13 page 99*
 lamprey *picture, volume 7 page 103***raindrop** (weather)

rainbow *volume 11 page 22*

rainfall (weather): *see in index* rain**rain forest**

MAIN ARTICLE *volume 11 page 23, picture, volume 11 page 24*

MORE TO EXPLORE

Africa *volume 1 page 40*
 Angola *volume 1 page 122*
 Cameroon *picture, volume 11 page 23*
 Gabon *picture, volume 5 page 78*
 Amazon
 Amazon River *volume 1 page 91*
 Brazil *volume 2 page 125*
 Costa Rica *picture, volume 3 page 74*
 forest *volume 5 page 53*

Rainier III (prince of Monaco)
 Monaco *volume 8 page 158***Rainier, Mount** (mountain in Washington state, U.S.) *picture, volume 15 page 16*
 Washington *volume 15 page 15***“Raisin in the Sun, A”** (play by Hansberry)
 Hansberry *volume 6 page 14***Raleigh** (state capital of North Carolina, U.S.)

MAIN ARTICLE *volume 11 page 25*

MORE TO EXPLORE

North Carolina *volume 9 page 85*
 State Capitol *picture, volume 11 page 25*

Raleigh, Sir Walter (English explorer)
 English colonies *picture, volume 1 page 105*

rally (meeting): *see in index* demonstrations and protests

Ramadan (month of fasting in Islam)
 MAIN ARTICLE *volume 11 page 25*

MORE TO EXPLORE

boys preparing meals *picture, volume 11 page 26*
 Islam *volume 6 page 164*

rambling (recreation): *see in index* hiking

Ram Mohun Roy (Indian reformer): *see in index* Roy, Ram Mohun**Ramses II** (ruler of Egypt)
 pharaoh *volume 10 page 69*
 statue of Ramses II *picture, volume 10 page 69***Rana family** (Nepali dynasty)
 Nepal *volume 9 page 32*

range (landform): *see in index* mountain range

Rangoon (capital city of Myanmar): *see in index* Yangon**Rania** (queen of Jordan) *picture, volume 7 page 34***rank** (military)
 army *volume 1 page 189***rap** (music)

MAIN ARTICLE *volume 11 page 26, picture, volume 11 page 26*

MORE TO EXPLORE

hip-hop *volume 6 page 58*

Raphael (Italian painter and architect)
 realistic portrait *picture, volume 11 page 46*
 Renaissance *volume 11 page 46*
 “School of Athens” *picture, volume 10 page 73*

rap music (music): *see in index* rap

“Rapper’s Delight” (song by Sugarhill Gang)
 hip-hop *volume 6 page 59*
 rap music *volume 11 page 26*

raptor (bird): *see in index* bird of prey

raqs sharqi (dance): *see in index* belly dance

rare-earth element (family of chemical elements)
 periodic table *table, volume 3 page 86*

rash (skin ailment)

Lyme disease *volume 7 page 188, picture, volume 7 page 188*

raspberry (plant and fruit)

MAIN ARTICLE *volume 11 page 27, picture, volume 11 page 27*

rat (rodent)

MAIN ARTICLE *volume 11 page 28, picture, volume 11 page 28*

MORE TO EXPLORE

rodent *volume 11 page 80*

rationality: *see in index* reason

rattle (musical instrument)

Chickasaw people *picture, volume 3 page 94*

rattlesnake

MAIN ARTICLE *volume 11 page 28, picture, volume 11 page 28*

MORE TO EXPLORE

tail *volume 13 page 7*

Ravardière, La (capital city of French

Guiana): *see in index* Cayenne

raven (bird)

MAIN ARTICLE *volume 11 page 29, picture, volume 11 page 29*

raw material (industry)

manufacturing *volume 8 page 46*

raw petroleum: *see in index* crude petroleum

ray (fish)

MAIN ARTICLE *volume 11 page 30*

MORE TO EXPLORE

stingrays swimming *picture, volume 11 page 30*

ray (mathematics)

geometry *volume 5 page 98*

ray flower (type of flower petal)

daisy *volume 4 page 6*
sunflower *volume 12 page 204*

rayon (textile fiber)

clothing *volume 3 page 142*
fibers *volume 5 page 17*

Rayy (ancient city in Iran)

Tehran *volume 13 page 32*

Rd. (in roadway names): *see in index* road

Re (Egyptian god): *see in index* Ra

reaction: *see in index* chemical reaction

“Reader’s Digest” (U.S. magazine)

magazine *volume 8 page 14*

reading (education)

Braille *picture, volume 2 page 121*
children *picture, volume 5 page 17, picture, volume 7 page 160, picture, volume 7 page 164*
writing *volume 15 page 77*

Reagan, Ronald (president of the U.S.)

MAIN ARTICLE *volume 11 page 31, picture, volume 11 page 32*

MORE TO EXPLORE

Bush *volume 2 page 155*
Ford *volume 5 page 52*
timeline *volume 11 page 31*

realism (artistic style)

painting *volume 10 page 10*

reason

Enlightenment *volume 4 page 142*

Reason, Age of (European history): *see in index* Enlightenment

reasoning: *see in index* reason

rebellion (politics)

war *volume 15 page 9*

recall (mental process)

memory *volume 8 page 99*

receiver (electronics and physics)

radar *volume 11 page 15*
radio *volume 11 page 19*
sound *picture, volume 12 page 134*
telegraph *volume 13 page 35*

receptor (sense cell)

senses *volume 12 page 68*

rechargeable battery (electronics): *see in index* secondary battery

reciprocating engine (motor)

airplane *volume 1 page 55*

recluse (monk): *see in index* hermit

recognition (mental process)

memory *volume 8 page 99*

Reconstruction (U.S. history)

MAIN ARTICLE *volume 11 page 33, picture, volume 11 page 33*

MORE TO EXPLORE

African Americans *volume 1 page 43*
American Civil War *volume 1 page 98*
carpetbagger *picture, volume 11 page 34*
Hayes *volume 6 page 30*

Johnson *volume 7 page 27*

United States *volume 14 page 29*

record player (sound-reproduction device): *see in index* phonograph

recreation

cave *volume 3 page 64*

recreational drug

drug *volume 4 page 79*

rectangle (mathematics)

geometry *volume 5 page 98*

rectum (anatomy)

human digestive system *picture, volume 4 page 47*

recycling

MAIN ARTICLE *volume 11 page 35*

MORE TO EXPLORE

conservation *volume 3 page 188*
images
Cub Scout gathering newspapers for recycling *picture, volume 12 page 53*
plastic *picture, volume 10 page 97*
sorted recyclables *picture, volume 11 page 35*
pollution *volume 10 page 118*

red (color)

light *picture, volume 3 page 155*
pigment *picture, volume 3 page 156*

red algae (protist) *picture, volume 1 page 77*

red-bellied lemur (primate) *picture, volume 7 page 128*

red-billed tropic bird

West Indies seabird in flight *picture, volume 15 page 32*

red blood cell

blood *volume 2 page 92, picture, volume 2 page 92*
lung *volume 7 page 184*

Red Cloud (Cayuga chief) *picture, volume 3 page 64*

Red Crescent (charitable organization):

see in index Red Cross and Red Crescent

Red Cross and Red Crescent (charitable organization)

MAIN ARTICLE *volume 11 page 36, picture, volume 11 page 36*

MORE TO EXPLORE

Barton *volume 2 page 30*

red elm (tree): *see in index* slippery elm

red-eyed tree frog (amphibian) *picture, volume 5 page 71*

Red Fort (fort in Delhi, India)
Delhi *volume 4 page 32, picture, volume 4 page 32*

red fox (mammal) *picture, volume 5 page 57*
fox *volume 5 page 57*

Red Guards (Chinese political movement)
Mao *volume 8 page 48*

red kangaroo (mammal)
marsupial *volume 8 page 63, picture, volume 8 page 63*

red panda (mammal): *see in index* lesser panda

Red Planet (planet): *see in index* Mars

Red Sea (sea in the Middle East)
MAIN ARTICLE *volume 11 page 37*

MORE TO EXPLORE
coral reef *picture, volume 11 page 37*

Red Square (square in Moscow, Russia)
picture, volume 8 page 186
May Day military parade *picture, volume 14 page 14*
Moscow *volume 8 page 186*

red squirrel (rodent): *see in index* Eurasian red squirrel

red-tailed hawk (bird)
bill structure and eating habits *picture, volume 2 page 77*

red-winged blackbird *picture, volume 2 page 84*
blackbirds *volume 2 page 84*

red wolf (mammal)
wolf *volume 15 page 54*

redwood (tree)
MAIN ARTICLE *volume 11 page 37, picture, volume 11 page 38*
MORE TO EXPLORE
conifer *volume 3 page 182, picture, volume 3 page 183*
sequoia *volume 12 page 70*

redwood sorrel (plant) *picture, volume 12 page 76*

reed (plant)
market in Ecuador *picture, volume 4 page 103*

reed (musical instrument part)
musical instruments *volume 8 page 216*

Reed Dance (Swazi ceremony) *picture, volume 12 page 211*

Reeds, Sea of (ancient sea in Egypt)
Moses *volume 8 page 188*

reed warbler (bird)
feeding cuckoo chick *picture, volume 3 page 229*

reef squid (mollusk), *picture, volume 12 page 172*

reel (cinematography)
movie *volume 8 page 198*

referee (sports)
soccer *volume 12 page 118*
wrestling *volume 15 page 74*
Chinese wrestlers *picture, volume 15 page 74*
sumo *picture, volume 15 page 73*

reference, frame of (physics)
motion *volume 8 page 191*

refinery (petroleum industry): *see in index* petroleum refinery

reflecting telescope
telescope *volume 13 page 38, picture, volume 13 page 38*

reflection (physics)
light and reflection properties *picture, volume 7 page 149*
mirror *volume 8 page 139*
optics *volume 9 page 143*

reflector (reflective surface): *see in index* mirror

Reformation (Christianity)
MAIN ARTICLE *volume 11 page 38*

MORE TO EXPLORE
Calvin *volume 3 page 16*
Christianity *volume 3 page 114*
Europe *volume 4 page 164*
Germany *volume 5 page 106*
Switzerland *volume 12 page 219*
Luther *volume 7 page 186, picture, volume 11 page 39*
Protestantism *volume 10 page 158*
Roman Catholicism *volume 11 page 83*

Reformed Judaism
Judaism *volume 7 page 38*

refracting telescope
telescope *volume 13 page 38, picture, volume 13 page 38*

refraction (physics)
mirage *volume 8 page 138*
optics *volume 9 page 143, picture, volume 9 page 143*

refrigeration (process of cooling)
food poisoning *volume 5 page 46*

refugee
MAIN ARTICLE *volume 11 page 39*

MORE TO EXPLORE
Afghan refugees *picture, volume 11 page 41*
Uzbek refugee camp in Kyrgyzstan *picture, volume 11 page 39*
World War II refugees *picture, volume 11 page 41*

refuse recycling: *see in index* recycling

reggae (music)
Jamaica *volume 7 page 10*

Regina (provincial capital of Saskatchewan, Canada)
legislative assembly building *picture, volume 12 page 40*
Saskatchewan *volume 12 page 39*

rehabilitation (criminal justice system)
prison *volume 10 page 154*

Rehoboth Beach (city in Delaware, U.S.)
beach *picture, volume 4 page 31*

Reims (city in France)
Joan of Arc *volume 7 page 25*

reincarnation (religious belief)
Dalai Lama *volume 4 page 7*
Hinduism *volume 6 page 56*
Jainism *volume 7 page 8*

reindeer (mammal)
MAIN ARTICLE *volume 11 page 42, picture, volume 11 page 42*
MORE TO EXPLORE
deer *volume 4 page 26*
usefulness to people
Chipewyan *volume 3 page 105*
Sami *picture, volume 5 page 22*

reinforced concrete (building material)
picture, volume 3 page 176
concrete *volume 3 page 176*

rejection (physiology)
transplant *volume 13 page 91*

relativity, special theory of (physics)
Einstein *volume 4 page 116*

relay (race format)
swimming *volume 12 page 216*
track and field *volume 13 page 86*

relief sculpture
sculpture *volume 12 page 55*

religion
MAIN ARTICLE *volume 11 page 42*

MORE TO EXPLORE
ancient Egypt *volume 4 page 113*
Asia *volume 1 page 203*
censorship *volume 3 page 69*

*To learn about some religions,
look for these articles:*

Baha'i Faith	Islam
Buddhism	Jainism
Christianity	Judaism
Confucius	Protestantism
Daoism	Roman
Eastern	Catholicism
Orthodox	Shinto
Churches	Sikhism
Hinduism	Zoroastrianism

religious art
painting *volume 10 page 7*
sculpture *volume 12 page 56*

religious music
classical music *volume 3 page 132*

Rembrandt (Dutch artist)
MAIN ARTICLE *volume 11 page 43, picture, volume 11 page 44*

Remembrance Day (British and Canadian holiday)
Veterans Day *volume 14 page 75*

remora fish
symbiosis *volume 12 page 222, picture, volume 12 page 221*

Renaissance (European history)
MAIN ARTICLE *volume 11 page 44*
MORE TO EXPLORE
arts
architecture *volume 1 page 171*
dance *volume 4 page 13*
drawing *volume 4 page 76*
Leonardo da Vinci *volume 7 page 131*
Michelangelo *volume 8 page 114*

painting *volume 10 page 9*
realistic portrait by Raphael *picture, volume 11 page 46*
sculpture *volume 12 page 56*
theater *volume 13 page 58*
Enlightenment influence *volume 4 page 142*
Europe *volume 4 page 164*
Italy *volume 6 page 173*
Rome *volume 11 page 87*
Vesalius *picture, volume 11 page 45*
Western Hemisphere, in about 1500
map, volume 11 page 45

renal pelvis (anatomy)
kidney *volume 7 page 63*

renewable resource (environment)
conservation *volume 3 page 187*
natural resources *volume 9 page 21*

Reno (city in Nevada, U.S.)
Nevada *volume 9 page 41*

Renoir, Pierre-Auguste (French artist)
Monet *volume 8 page 160*
painting *volume 10 page 10*

reporter (journalism)
newspaper *volume 9 page 54*

representative, sales (business): *see in index* sales agent

representative democracy (form of government)
democracy *volume 4 page 35*
government *volume 5 page 131*

Representatives, House of (U.S. government)
House and Senate joint session *picture, volume 14 page 33*
United States government *volume 14 page 33*

reproduction (biology)
animals
amphibians
frog *volume 5 page 71*
toad *volume 13 page 73*
birds *volume 2 page 78*
mammals *volume 8 page 37*
ape *volume 1 page 148*
monkey *volume 8 page 169*
primate *volume 10 page 149*
rabbit and hare *volume 11 page 14*
marine animals
fish *volume 5 page 28*

hydra *volume 6 page 104, picture, volume 6 page 104*
mollusk *volume 8 page 157*
sea horse *volume 12 page 59*
shark *volume 12 page 77*
microorganisms
amoeba *volume 1 page 109*
bacteria *volume 2 page 5*
reptiles
lizard *volume 7 page 171*
python *volume 10 page 172*
worm *volume 15 page 71*
genetics *volume 5 page 93*
living thing *volume 7 page 168*

reproductive system (anatomy and physiology)

MAIN ARTICLE *volume 11 page 46*

MORE TO EXPLORE
adolescence *volume 1 page 31*
female and male reproductive systems
picture, volume 11 page 47
ovary and egg cycle *picture, volume 11 page 48*
pregnancy and fetus development
picture, volume 11 page 49, picture, volume 11 page 50

reptile (animal class)
MAIN ARTICLE *volume 11 page 50*
MORE TO EXPLORE

animal *volume 1 page 125*
vertebrates *volume 14 page 72*
brain *volume 2 page 122, picture, volume 2 page 122*
ear *volume 4 page 88*
egg *volume 4 page 108*
hibernation *volume 6 page 50*
images
adder's scales *picture, volume 11 page 51*
crocodiles *picture, volume 11 page 51*
eastern box turtle *picture, volume 11 page 53*
flying lizard *picture, volume 11 page 52*
nose *volume 9 page 100*
prehistoric life *volume 10 page 145*
urinary system *volume 14 page 41*

republic (form of government)
MAIN ARTICLE *volume 11 page 53*

MORE TO EXPLORE
ancient Rome *volume 11 page 89*
democracy *volume 4 page 35*
monarchy *volume 8 page 159*

República, Plaza de la (plaza in Buenos Aires, Argentina) *picture, volume 2 page 145*

Republican (Spanish history)
Spanish Civil War *volume 12 page 158, picture, volume 12 page 158*

Republican Party (U.S. political party, 1790-1820)
Adams *volume 1 page 23*
Hamilton *volume 6 page 11*
Jefferson *volume 7 page 18*

Republican Party (U.S. political party, 1854-present)
Lincoln *volume 7 page 155*
Taft *volume 13 page 5*

República Portuguesa (country in Europe): *see in index* Portugal

Republic of: *see in index under the specific part of the name, for example, Benin; Congo, Republic of the except as found below*

Republic of China (self-governing island in Asia): *see in index* Taiwan

Republic of Colombia (historic republic in South America): *see in index* Gran Colombia

“Requiem” (work by Mozart)
Mozart *volume 8 page 201*

Research Triangle Park (area of North Carolina, U.S.)
Raleigh *volume 11 page 25*

reservation, Indian: *see in index* Indian reservation

reservoir rock (geology)
petroleum *volume 10 page 68*

residency (medical practice)
medicine *volume 8 page 93*

resin (chemical compound)
amber *volume 1 page 92*
fossil *volume 5 page 55*
pine *volume 10 page 86*

resource (ecology): *see in index* natural resource

resource recovery: *see in index* recycling

respiration (gas exchange between organisms and environment)
air *volume 1 page 51*
nose *volume 9 page 99*

respiratory system (anatomy and physiology)

MAIN ARTICLE *volume 11 page 54*

MORE TO EXPLORE

cough *volume 3 page 206*

images

alveoli and capillaries *picture, volume 11 page 55*

breathing *picture, volume 11 page 56*

fish *picture, volume 11 page 54*

grasshopper *picture, volume 11 page 54*

living thing *volume 7 page 168*

resurrection (religion)

Easter *volume 4 page 93*

Jesus Christ *volume 7 page 23*

Koran *volume 7 page 78*

reticulated python (snake)

python *volume 10 page 172*

retina (anatomy of the eye)

eye *volume 4 page 176, picture, volume 4 page 175*

lens *volume 7 page 131*

retrieval (mental process): *see in index* recall

returning boomerang (weapon and toy)
boomerang *volume 2 page 110*

“Return of the Jedi” (film)
model for special effects *picture, volume 8 page 198*

“Return of the King, The” (work by Tolkien)
Tolkien *volume 13 page 77*

Réunion (island in the Indian Ocean and department of France)

MAIN ARTICLE *volume 11 page 56*

MORE TO EXPLORE

mountains *picture, volume 11 page 56*

Revelation, Book of (New Testament)
Bible *volume 2 page 68*

“Revelations” (dance by Ailey)
Ailey *volume 1 page 51*

Revelation to John (New Testament): *see in index* Revelation, Book of

Revere, Paul (U.S. military officer and silversmith)

MAIN ARTICLE *volume 11 page 57, picture, volume 11 page 57*

MORE TO EXPLORE

American Revolution *volume 1 page 100*

decorative arts *volume 4 page 25*

minuteman *volume 8 page 138*

revolution (politics)

war *volume 15 page 9*

Revolution, American (U.S. history, 1775-83): *see in index* American Revolution

Revolution, French (French history, 1789): *see in index* French Revolution

Revolution, Russian (Russian history, 1917): *see in index* Russian Revolution

Reye’s syndrome (disease)

MAIN ARTICLE *volume 11 page 58*

MORE TO EXPLORE

chicken pox *volume 3 page 95*

Reyes Católicos (Spanish history): *see in index* Catholic Monarchs

Reykjavík (capital city of Iceland)

MAIN ARTICLE *volume 11 page 59*

MORE TO EXPLORE

Iceland *volume 6 page 108*

Reza Shah Pahlavi (shah of Iran)
Iran *volume 6 page 149*

Rezu’at ‘Azza (territory in the Middle East): *see in index* Gaza Strip

RFU (British sports organization): *see in index* Rugby Football Union

Rgveda (Hindu literature): *see in index* Rigveda

Rhea (Greek goddess)

Demeter *volume 4 page 34*

Hades *volume 6 page 5*

Hera *volume 6 page 43*

Zeus *volume 15 page 104*

rhea (bird)

flightless birds *volume 2 page 79*

Rhine River (river in Europe)

Germany *volume 5 page 105*

Liechtenstein *volume 7 page 147*

rhinoceros (mammal)

MAIN ARTICLE *volume 11 page 59, picture, volume 11 page 59*

rhinoceros viper (reptile)

various snakes *picture, volume 12 page 113*

rhizome (botany)iris *volume 6 page 157***Rhode Island** (state in the U.S.)MAIN ARTICLE *volume 11 page 60*

MORE TO EXPLORE

geography

Breakers mansion *picture, volume 11 page 61*Newport Harbor *picture, volume 11 page 61*Providence *picture, volume 10 page 160*

history

Narraganset *volume 9 page 10*Tyler *volume 13 page 124***Rhodesia** (historical country in Africa):*see in index* Zimbabwe**Rhodesia and Nyasaland, Federation of**

(historical federation in Africa)

Zimbabwe *volume 15 page 106***rhododendron** (woody plant)MAIN ARTICLE *volume 11 page 62, picture, volume 11 page 62***rhubarb** (plant and food)MAIN ARTICLE *volume 11 page 62, picture, volume 11 page 62***rhyme** (poetic device)poetry *volume 10 page 105***rhythm** (music)dance *volume 4 page 12*music *volume 8 page 212***rhythm** (poetry)poetry *volume 10 page 105***rhythmic gymnastics** (sport) *picture,**volume 5 page 174*gymnastics *volume 5 page 175***rhythmic metre** (music): *see in index*

meter

rib (bone)respiratory system *volume 11 page 55***Ribat** (capital city of Morocco): *see in**index* Rabat**ribat** (architecture)Ribat of Harthema, in Monastir, Tunisia *picture, volume 13 page 110***Ribat al-Fath** (capital city of Morocco):*see in index* Rabat**Ribaut, Jean** (French explorer)French exploration of Florida *picture, volume 1 page 107***rib cage** (anatomy)respiratory system *picture, volume 11 page 56*lungs *picture, volume 7 page 184*skeletal system *volume 12 page 96***rice** (grain)MAIN ARTICLE *volume 11 page 63*

MORE TO EXPLORE

cultivation areas

Arkansas *picture, volume 1 page 181*Mekong River *volume 8 page 96*Philippines *picture, volume 10 page 72***rice paddy** (agriculture): *see in index*

paddy

Richmond (state capital of Virginia, U.S.)MAIN ARTICLE *volume 11 page 64, picture, volume 11 page 64*

MORE TO EXPLORE

Virginia *volume 14 page 94***Richmond, Henry Tudor, earl of** (king of England): *see in index* Henry VII**Richter scale** (seismology)earthquake *volume 4 page 93***Rickey, Branch** (U.S. baseball executive)Robinson *volume 11 page 73***rickshaw** (vehicle)busy street in Dhaka *picture, volume 4 page 43***Riddar Island** (island of Stockholm, Sweden) *picture, volume 12 page 187***Ride, Sally** (U.S. astronaut and physicist)MAIN ARTICLE *volume 11 page 64, picture, volume 11 page 65*

MORE TO EXPLORE

space exploration *volume 12 page 152***Rideau Canal** (canal in Ontario, Canada)Ottawa *volume 9 page 155***ride sharing**: *see in index* carpooling**ridged field cultivation** (agriculture): *see in index* terrace cultivation**Riel, Louis** (Canadian rebel leader)Manitoba *volume 8 page 45***rifle** (weapon)weapon *volume 15 page 26, picture, volume 15 page 26***Rift Valley** (geological feature in Africa and Asia): *see in index* Great Rift Valley**rift valley** (landform)valley *volume 14 page 53***Riga** (capital city of Latvia)MAIN ARTICLE *volume 11 page 65, picture, volume 11 page 65*

MORE TO EXPLORE

Latvia *volume 7 page 115***right angle** (mathematics)geometry *volume 5 page 98***right-angled triangle** (mathematics): *see in index* right triangle**right of asylum** (law): *see in index* asylum**Rights, Bill of** (British history)Parliament *volume 10 page 38***Rights, Bill of** (United States Constitution): *see in index* United States Bill of Rights**rights, civil** (law): *see in index* civil rights**rights, human**: *see in index* human rights**Rights of Man and of the Citizen, Declaration of the** (document of the French Revolution, 1789)French Revolution *volume 5 page 70*human rights *volume 6 page 97*Lafayette *volume 7 page 101***right to public assembly**bill of rights *volume 2 page 70***right to vote**: *see in index* suffrage**right triangle** (mathematics)geometry *volume 5 page 98***Rigveda** (Hindu literature)Veda *volume 14 page 60***Rijn, Rembrandt Harmenszoon van**(Dutch artist): *see in index* Rembrandt**rime** (poetic device): *see in index* rhyme**ring** (boxing)boxing *volume 2 page 118***ring** (planetary)planets *volume 10 page 93, picture, volume 10 page 93*Saturn *volume 12 page 42*

- Uranus *volume 14 page 39*
- Ringling Bros. and Barnum & Bailey Circus** (U.S. circus company)
circus *volume 3 page 120*
- ringmaster** (circus)
circus *volume 3 page 120*
- ring of fire** (chain of volcanic activity in the Pacific Ocean)
MAIN ARTICLE *volume 11 page 66*
MORE TO EXPLORE
earthquake *volume 4 page 92*
Pacific Ocean *volume 10 page 4*
plate tectonics *volume 10 page 98*
volcano *volume 14 page 100*
- rings** (gymnastics)
gymnastics *volume 5 page 174, picture, volume 5 page 175*
- ring system** (planetary): *see in index* ring
- ring-tailed lemur** (mammal)
lemur *volume 7 page 128*
primate *picture, volume 10 page 149*
tail *volume 13 page 7*
- rink** (ice skating facility): *see in index* hockey rink; ice rink
- Rio de Janeiro** (city in Brazil)
MAIN ARTICLE *volume 11 page 66, picture, volume 11 page 67*
MORE TO EXPLORE
Carnival *picture, volume 2 page 127*
- Río de la Plata** (historical viceroyalty and state in South America)
Argentina *volume 1 page 176*
- Rio dos Camarões** (river in Africa): *see in index* Wouri River
- Rio Grande** (river in North America)
Big Bend National Park *picture, volume 9 page 79*
- Río Negro** (river in Uruguay)
Uruguay *volume 14 page 42*
- Río Negro, Embalse del** (artificial lake in Uruguay): *see in index* Embalse del Río Negro
- river**
MAIN ARTICLE *volume 11 page 67*
MORE TO EXPLORE
dam *volume 4 page 9*
erosion
canyon formation *volume 3 page 31*
valley *volume 14 page 52, picture, volume 4 page 152, picture, volume 14 page 53*
flood *volume 5 page 33*
irrigation *volume 6 page 160*
Jordan River *picture, volume 7 page 36*
Mississippi River *picture, volume 11 page 67*
water *volume 15 page 22*
waterfall *volume 15 page 24*
- Rivera, Diego** (Mexican painter)
MAIN ARTICLE *volume 11 page 68*
MORE TO EXPLORE
Kahlo *volume 7 page 44*
Mexico City *volume 8 page 114*
“Pan American Unity” *picture, volume 11 page 68*
- riverboat** (vessel): *see in index* steamboat
- river dolphin** (mammal)
dolphin *volume 4 page 64*
- River Indians** (Native American people): *see in index* Mohican
- river jack** (reptile): *see in index* rhinoceros viper
- river mouth** (river): *see in index* mouth
- Riyadh** (capital city of Saudi Arabia)
MAIN ARTICLE *volume 11 page 69, picture, volume 11 page 69*
MORE TO EXPLORE
Kingdom Centre building *picture, volume 12 page 45*
King’s Camel Race *picture, volume 12 page 44*
Saudi Arabia *volume 12 page 43*
- roach** (insect): *see in index* cockroach
- road** (transportation)
MAIN ARTICLE *volume 11 page 70*
MORE TO EXPLORE
common abbreviations *table, volume 1 page 8*
images
cloverleaf *picture, volume 11 page 71*
unpaved country road *picture, volume 11 page 70*
Persia *volume 10 page 61*
transportation *volume 13 page 92*
- road bicycle** (vehicle): *see in index* racing bicycle; touring bicycle
- road race** (bicycle race)
cycling *volume 3 page 234*
- road-racing bicycle** (vehicle): *see in index* racing bicycle
- roadrunner** (bird)
MAIN ARTICLE *volume 11 page 71, picture, volume 11 page 71*
MORE TO EXPLORE
cuckoo *volume 3 page 229*
- road sign**: *see in index* street sign
- Robbins, Jerome** (U.S. choreographer)
dance *volume 4 page 14*
- Robert I** (king of Scotland)
Scotland *volume 12 page 53*
- Roberts, John G., Jr.** (U.S. jurist)
U.S. Senate confirmation hearing *picture, volume 14 page 36*
- Robert the Bruce** (king of Scotland): *see in index* Robert I
- Robespierre, Maximilien de** (French revolutionary) *picture, volume 5 page 70*
- robin** (bird)
MAIN ARTICLE *volume 11 page 72*
MORE TO EXPLORE
American robin *picture, volume 2 page 78, picture, volume 11 page 72*
European robin *picture, volume 11 page 72*
- Robinson, Jackie** (U.S. athlete)
MAIN ARTICLE *volume 11 page 73, picture, volume 11 page 73*
MORE TO EXPLORE
Campanella, Doby, Newcombe, and Robinson *picture, volume 2 page 32*
- Robinson, Jesse Louis** (U.S. minister activist): *see in index* Jackson, Jesse
- Robinson, Ray Charles** (U.S. musician): *see in index* Charles, Ray
- “Robinson Crusoe”** (work by Defoe)
literature for children *volume 7 page 163*
- robot**
MAIN ARTICLE *volume 11 page 74, picture, volume 11 page 74*
MORE TO EXPLORE
Mars robot Opportunity *picture, volume 12 page 152*
technology and invention *volume 13 page 28*
- rock** (geology)
MAIN ARTICLE *volume 11 page 75*

MORE TO EXPLORE

soil *volume 12 page 124*

rock (music): *see in index* rock music

rock and roll (music): *see in index* rock music

Rock and Roll Hall of Fame (museum in Cleveland, Ohio, U.S.) *picture, volume 9 page 126*

rock bass (fish)
bass *volume 2 page 37*

rock carving: *see in index* petroglyph

rock cycle (geology)
rock *volume 11 page 76*

rock elm (tree)
elm *volume 4 page 128*

rocket (jet-propulsion device)
MAIN ARTICLE *volume 11 page 76, picture, volume 11 page 77*

“**Rocket**” (steam locomotive) *picture, volume 11 page 21*

rockfall (geology)
landslide *volume 7 page 104*

Rockies, The (mountain range in North America): *see in index* Rocky Mountains

rock moss (plant): *see in index* granite moss

rock music
MAIN ARTICLE *volume 11 page 77, picture, volume 11 page 78*

MORE TO EXPLORE

popular music *volume 10 page 128*
Presley *volume 10 page 146*

Rock of Monaco (area in Monaco)
Monaco *volume 8 page 158*

Rocky Mountains (mountain range in North America)
MAIN ARTICLE *volume 11 page 78, picture, volume 11 page 79*

MORE TO EXPLORE

Canada
Alberta *volume 1 page 69*
Banff National Park *picture, volume 3 page 23*
North America *volume 9 page 79*
United States *volume 14 page 24*
Colorado *volume 3 page 157*
Idaho *volume 6 page 111*

Bitterroot Mountains *picture, volume 6 page 112*

Wyoming *volume 15 page 79*

Rocky Mountain spotted fever (disease)
American dog ticks *picture, volume 13 page 63*

rococo (artistic style)
painting *volume 10 page 10*

rod (retinal cell)
eye *volume 4 page 176*

rodent (mammal)
MAIN ARTICLE *volume 11 page 80*

MORE TO EXPLORE

caprybara *picture, volume 11 page 80*

rodeo (sport)
cowboys *picture, volume 15 page 80*
horse *volume 6 page 87*

Rodgers, Jimmie (U.S. singer)
country music *volume 3 page 208*

Rodin, Auguste (French sculptor)
sculpture *volume 12 page 57*

Rodney, Caesar (U.S. statesman)
Delaware *volume 4 page 31*

roe (fish eggs)
egg *volume 4 page 108*

Roentgen ray (radiation beam): *see in index* X-ray

Rogers, Mount (mountain in Virginia, U.S.)
Virginia *volume 14 page 94*

Rolfe, John (British colonial official)
Jamestown *volume 7 page 11*
Pocahontas *volume 10 page 104*

rolled oats
oats *volume 9 page 115*

Rollerblading (recreation): *see in index* in-line skating

roller skating (sport)
MAIN ARTICLE *volume 11 page 80*

MORE TO EXPLORE

in-line skating *picture, volume 11 page 81*
skating *volume 12 page 94*

Rom (people)
MAIN ARTICLE *volume 11 page 81, picture, volume 11 page 81*

MORE TO EXPLORE

flamenco dancer *picture, volume 12 page 154*
nomad *volume 9 page 77*

Roma (capital city of Italy): *see in index* Rome

romaine lettuce (vegetable)
lettuce *volume 7 page 135*

Roman alphabet: *see in index* Latin alphabet

Roman Catholic Church (Christianity):
see in index Roman Catholicism

Roman Catholicism (Christianity)
MAIN ARTICLE *volume 11 page 82*

MORE TO EXPLORE

architecture *volume 1 page 170*
images
African church *picture, volume 15 page 85*
church altar *picture, volume 3 page 112*
Colombian church *picture, volume 3 page 153*
Polish monastery *picture, volume 10 page 108*
beliefs and practices
Bible *volume 2 page 67*
Mass *picture, volume 11 page 82*
pope *volume 10 page 125*
saint *volume 12 page 9*
Central America *volume 3 page 75*
Christianity *volume 3 page 112*
Europe *volume 4 page 162*
history
Elizabeth I *volume 4 page 125*
Enlightenment *volume 4 page 142*
Holy Roman Empire *volume 6 page 74*
Inquisition *volume 6 page 137, picture, volume 6 page 137*
Galileo *volume 5 page 82*
refugee *volume 11 page 40*
Ireland *volume 6 page 154*
Northern Ireland *volume 9 page 90*
Protestantism
Huguenots *volume 6 page 92*
Reformation *volume 11 page 38*
Henry VIII *volume 6 page 39*
Luther *volume 7 page 186*
United Kingdom *picture, volume 14 page 18*
Latin America *volume 7 page 113*
North America *volume 9 page 81*

Maryland *volume 8 page 69*
 South African worshippers *picture, volume 11 page 83*

Romance languages

ancient Rome *volume 11 page 89*
 Europe *volume 4 page 162*
 language *volume 7 page 105*

Roman Civil War (ancient Roman history)
 ancient Rome *volume 11 page 90*

Roman Empire (ancient state, 27 BC–476 AD): *see in index* Rome, ancient

Romanesque art (artistic period and style)
 architecture *volume 1 page 170*

Roman Forum (forum in Rome, Italy)
 Rome *volume 11 page 87*

Romania (country in Europe)
 MAIN ARTICLE *volume 11 page 84, picture, volume 11 page 84*

MORE TO EXPLORE

folk festival *picture, volume 11 page 85*
 geography
 Bucharest *picture, volume 2 page 140*
 castle *picture, volume 11 page 85*
 Moldova *volume 8 page 154*
 Chisinau *volume 3 page 107*

Roman numeral

MAIN ARTICLE *volume 11 page 86*

MORE TO EXPLORE

clock *picture, volume 11 page 86*
 numbers and number systems *volume 9 page 107*

Romanov dynasty (Russian dynasty)
 Russia *volume 11 page 106*

Roman Republic and Empire (ancient state in Europe, Africa, and Asia): *see in index* Rome, ancient

romanticism (artistic style)
 painting *volume 10 page 10*

Romany language

Rom *volume 11 page 82*

Rome (capital city of Italy)

MAIN ARTICLE *volume 11 page 87, picture, volume 11 page 87*

MORE TO EXPLORE

catacomb *volume 3 page 58*
 city *volume 3 page 125*
 Colosseum *picture, volume 11 page 90*

Italy *volume 6 page 172*

Rome, ancient (ancient state in Europe, Africa, and Asia)

MAIN ARTICLE *volume 11 page 88*

MORE TO EXPLORE

arts

architecture *volume 1 page 169*
 Colosseum *picture, volume 11 page 90*
 concrete *volume 3 page 176*
 Hadrian's Wall *picture, volume 4 page 131*
 temple *volume 13 page 42, picture, volume 3 page 237*
 theater in Amman, Jordan *picture, volume 1 page 108*
 theater in Libya *picture, volume 7 page 145*

mosaic *picture, volume 11 page 89*

sculpture *volume 12 page 56*

banking *volume 2 page 25*

government and law

census *volume 3 page 71*
 dictatorship *volume 4 page 46*
 human rights *volume 6 page 97*
 republic *volume 11 page 54*

history

Bonn *volume 2 page 107*
 Christianity *volume 3 page 113*
 decline

 human migration *volume 8 page 127*

empire *volume 4 page 130*

Europe *volume 4 page 163*

France *volume 5 page 59*

Great Britain *volume 14 page 18*

 Cardiff *volume 3 page 37*

 London *volume 7 page 175*

 Wales *volume 15 page 4*

important people

 Augustus *volume 1 page 227*
 Caesar *volume 3 page 7*
 Cleopatra *volume 3 page 134*
 Italy *volume 6 page 173*

Romania *volume 11 page 84*

Spain *volume 12 page 154*

Turkey *volume 13 page 112*

people and culture

Africa

 Carthage *volume 3 page 48*
 Libya *volume 7 page 145*
 Tunis *volume 13 page 108*

armor *picture, volume 1 page 186*

circus *volume 3 page 120*

fascis *picture, volume 5 page 7*

fig *volume 5 page 18*

flag *volume 5 page 30*

gladiator *volume 5 page 117*

Pompeii *volume 10 page 120*

slavery *volume 12 page 106*

sports *volume 12 page 168*

 boxing *volume 2 page 119*

 swimming *volume 12 page 217*

science and technology

aqueduct *volume 1 page 156, picture, volume 1 page 155*

brass *volume 2 page 123*

calendar *volume 3 page 10*

catapult *volume 3 page 59*

numbers and number systems *volume 9 page 107*

road *volume 11 page 71*

“Romeo and Juliet” (play by Shakespeare)
 balcony scene *picture, volume 7 page 161*

Rommel, Erwin (German field marshal)
 World War II *volume 15 page 68*

Roosevelt, Anna Eleanor (U.S. diplomat, humanitarian, and first lady): *see in index* Roosevelt, Eleanor

Roosevelt, Edith (first lady of the U.S.)
 Roosevelt *volume 11 page 94*

Roosevelt, Eleanor (U.S. diplomat, humanitarian, and first lady)

MAIN ARTICLE *volume 11 page 91, picture, volume 11 page 91*

MORE TO EXPLORE

Anderson *volume 1 page 117*

Roosevelt, Franklin *volume 11 page 92*

Universal Declaration of Human Rights *picture, volume 6 page 98*

Roosevelt, Franklin D. (president of the U.S.)

MAIN ARTICLE *volume 11 page 92, picture, volume 11 page 92*

MORE TO EXPLORE

Great Depression *volume 5 page 147*

Hoover *volume 6 page 82*

Roosevelt, Eleanor *volume 11 page 91*

timeline *volume 11 page 92*

Truman *volume 13 page 100*

World War II *volume 15 page 70*
 meeting at Yalta *picture, volume 15 page 70*

Roosevelt, Theodore (president of the U.S.)

MAIN ARTICLE *volume 11 page 94, picture, volume 11 page 94*

MORE TO EXPLORE

Spanish-American War *volume 12*
page 157
 Taft *volume 13* *page 5*
 timeline *volume 11* *page 94*

Roosevelt Dam (dam in Arizona, U.S.)
 Phoenix *volume 10* *page 76*

rooster (bird) *picture, volume 3* *page 94*
 chicken *volume 3* *page 94*

root (plant part)
 MAIN ARTICLE *volume 11* *page 96*

MORE TO EXPLORE

images
 interior *picture, volume 11* *page 96*
 grass and sugar beet roots *picture, volume 11* *page 96*
 mistletoe *picture, volume 10* *page 33*
 seed *volume 12* *page 62*
 sweet potato *volume 12* *page 215*
 vegetable *volume 14* *page 61*

root (tooth)
 teeth *volume 13* *page 31*

root hair (root part)
 root *volume 11* *page 96*, *picture, volume 11* *page 96*

root system (plant part): *see in index* root

root tip (root part)
 root *volume 11* *page 96*

Rorschach Test (psychological tool) *picture, volume 10* *page 162*

rose (plant and flower)
 MAIN ARTICLE *volume 11* *page 97*, *picture, volume 11* *page 97*

roseate spoonbill (bird)
 bill structure and eating habits *picture, volume 2* *page 77*

Roseau (capital city of Dominica)
 MAIN ARTICLE *volume 11* *page 97*

MORE TO EXPLORE

cathedral *picture, volume 11* *page 98*
 Dominica *volume 4* *page 65*

rose fever (medical disorder): *see in index* hay fever

rose hip (botany)
 rose *volume 11* *page 97*

rosemary (herb)
 herb *volume 6* *page 45*

rose period (Picasso)
 Picasso *volume 10* *page 80*

Rosetta Stone
 hieroglyphic writing *volume 6* *page 54*

Rosh Hashana (Judaism)
 MAIN ARTICLE *volume 11* *page 98*, *picture, volume 11* *page 98*

MORE TO EXPLORE

New Year's Day *volume 9* *page 56*

Ross, Araminta (U.S. abolitionist): *see in index* Tubman, Harriet

Ross, Betsy (U.S. seamstress)
 MAIN ARTICLE *volume 11* *page 98*, *picture, volume 11* *page 99*

MORE TO EXPLORE

flags *volume 5* *page 29*

Ross, Nellie Tayloe (governor of Wyoming)
 Wyoming *volume 15* *page 79*

Rossio Square (square in Lisbon, Portugal): *see in index* Dom Pedro IV Square

rotary engine
 internal-combustion engine *volume 6* *page 141*

rotation (physics)
 Moon *volume 8* *page 178*
 planets and dwarf planets *volume 10* *page 93*, *picture, volume 10* *page 93*
 Earth *volume 4* *page 90*
 Mars *volume 8* *page 59*
 Mercury *volume 8* *page 102*
 Neptune *volume 9* *page 33*
 Pluto *volume 10* *page 101*
 Saturn *volume 12* *page 42*
 Uranus *volume 14* *page 39*
 Venus *volume 14* *page 66*

Rothko, Mark (U.S. artist)
 painting *volume 10* *page 11*

rotor (helicopter part): *see in index* main rotor; tail rotor

Rotorua (city in New Zealand)
 Maori village *picture, volume 9* *page 62*

rough (golf)
 golf *volume 5* *page 125*

Rough Rider (U.S. cavalry)
 Roosevelt *volume 11* *page 94*
 Spanish-American War *volume 12* *page 157*

round (sports)
 boxing *volume 2* *page 118*

rounders (English game)
 baseball *volume 2* *page 32*

Round Table, Order of the (legendary group of knights) *picture, volume 1* *page 193*
 Arthurian legend *volume 1* *page 194*

roundworm (animal)
 parasite *volume 10* *page 33*
 worm *volume 15* *page 71*

Rousseau, Jean-Jacques (Swiss-born French philosopher)
 constitution *volume 3* *page 189*
 human rights *volume 6* *page 97*

rowboat (watercraft)
 boat *volume 2* *page 98*, *picture, volume 2* *page 98*
 Mekong delta in Vietnam *picture, volume 8* *page 96*

Rowlands, John (British explorer): *see in index* Stanley, Sir Henry Morton

Rowling, J. K. (British author)
 MAIN ARTICLE *volume 11* *page 99*, *picture, volume 11* *page 99*

MORE TO EXPLORE

literature for children *volume 7* *page 164*

Roy, Ram Mohun (Indian reformer)
 Hinduism *volume 6* *page 57*

Royal Bengal (animal): *see in index* Bengal tiger

Royal Marines (British military)
 marines *volume 8* *page 56*

Royal Palace (palace in Phnom Penh, Cambodia) *picture, volume 10* *page 74*

royal python (snake): *see in index* ball python

Royal Road (ancient road in Asia)
 Persia *volume 10* *page 61*

royalty (insect caste)
 termite *volume 13* *page 48*

Rua (Hun ruler): *see in index* Rugila

Rub' al-Khali (desert in Arabia)
 Saudi Arabia *volume 12* *page 43*

rubber (part of baseball field)
 baseball *volume 2* *page 31*

rubella (disease)

MAIN ARTICLE *volume 11 page 100, picture, volume 11 page 100*

Rubens, Peter Paul (Flemish artist)

Marie de Médicis *picture, volume 8 page 91*

painting *volume 10 page 10*

rubeola (disease): *see in index* measles

ruby (gemstone)

jewelry and gems *volume 7 page 24*

rudder (steering mechanism)

airplane *volume 1 page 55*

boat *volume 2 page 97, picture, volume 2 page 97*

Rudolf I (king of Germany)

Hapsburgs *volume 6 page 15, picture, volume 6 page 15*

statue *picture, volume 6 page 74*

Rudolph, Wilma (U.S. athlete)

MAIN ARTICLE *volume 11 page 100, picture, volume 11 page 101*

rug (floor covering)

MAIN ARTICLE *volume 11 page 101, picture, volume 11 page 101*

MORE TO EXPLORE

Iranian weaver *picture, volume 6 page 149*

Uzbekistan synagogue *picture, volume 12 page 222*

rugby (sport)

MAIN ARTICLE *volume 11 page 102, picture, volume 11 page 102, picture, volume 11 page 103*

Rugby Football League (British sports organization)

rugby *volume 11 page 103*

Rugby Football Union (British sports organization)

rugby *volume 11 page 103*

Rugby School (school in Rugby, England, United Kingdom)

rugby *volume 11 page 103*

Rugby Union (British sports organization): *see in index* Rugby Football Union

rugger (sport): *see in index* rugby

Rugila (Hun ruler)

Hun *volume 6 page 99*

Ruhallah Khomeyni (Iranian leader): *see in index* Khomeini, Ayatollah Ruhollah

Rumford (city in New Hampshire, U.S.): *see in index* Concord

runner (plant part)

plant *volume 10 page 96*

running (athletics)

sprinter *picture, volume 5 page 17*

track and field *volume 13 page 84, picture, volume 13 page 85*

running (locomotion)

ostrich *volume 9 page 154*

running track (athletics)

track and field *volume 13 page 84*

runoff (hydrology)

flood *volume 5 page 33*

Rupert's Land (historical region in Canada)

Northwest Territories *volume 9 page 96*

Russell, Charles Edward (U.S. journalist and writer)

1910 campaign poster *picture, volume 12 page 119*

Russia (country in Europe and Asia)

MAIN ARTICLE *volume 11 page 104*

MORE TO EXPLORE

arts

architecture

Cathedral of Saint Basil the Blessed *picture, volume 4 page 94*

kremlin: *see in index* kremlin

Hermitage *picture, volume 1 page 196*

geography

Asia *volume 1 page 200*

Belaya River *picture, volume 14 page 38*

small town *picture, volume 11 page 105*

Ural Mountains *volume 14 page 38*

Volga River *volume 14 page 103*

history

Alaska

Tlingit *picture, volume 13 page 72*

Estonia *volume 4 page 154*

exploration and settlement of the

Americas *volume 1 page 107*

feudalism *volume 5 page 14*

Finland *volume 5 page 23*

Helsinki *volume 6 page 36*

Kyrgyzstan *volume 7 page 94*

Latvia *volume 7 page 115*

Riga *volume 11 page 66*

Moldova

Chisinau *volume 3 page 107*

Napoleon I *volume 9 page 8*

Sweden *volume 12 page 214*

timeline *volume 11 page 104*

tsar *volume 13 page 103*

Vikings *volume 14 page 89*

World War I *volume 15 page 61*

natural gas *volume 5 page 92, picture, volume 5 page 92*

winter *picture, volume 11 page 105*

Russian Civil War (Russian history, 1918–20)

Russian Revolution *volume 11 page 108*

Russian Communist Party: *see in index* Communist Party of the Soviet Union

Russian Empire (historic Eurasian empire)

Helsinki *volume 6 page 36*

Kiev *volume 7 page 64*

Peter the Great *volume 10 page 67*

Poland *volume 10 page 108*

Tallinn *volume 13 page 13*

Tbilisi *volume 13 page 24*

Tlingit *volume 13 page 71*

Russian Orthodox church (Eastern Orthodoxy)

Eastern Orthodox Churches *volume 4 page 94, picture, volume 4 page 94*

Russian Revolution (Russian history, 1917)

MAIN ARTICLE *volume 11 page 108*

MORE TO EXPLORE

Lenin *volume 7 page 130, picture, volume 14 page 13*

Moscow *volume 8 page 187*

Nicholas II *volume 9 page 65*

protesters outside the tsar's palace in Petrograd *picture, volume 11 page 108*

Russia *volume 11 page 107*

Stalin *volume 12 page 176*

World War I *volume 15 page 64*

rust (plant disease)

parasite *volume 10 page 33*

Rutgers University (university system in New Jersey, U.S.)

football *volume 5 page 50*

Ruth, Babe (U.S. baseball player)

MAIN ARTICLE *volume 11 page 109, picture, volume 11 page 109*

rutting season (zoology): *see in index* mating season

Rwanda (country in Africa)

MAIN ARTICLE *volume 11 page 110*

MORE TO EXPLORE

open-air market *picture, volume 7 page 64*

women carrying baskets *picture, volume 11 page 110*

Rwandan Civil War (1990–1997)

Rwanda *volume 11 page 110*

rye (plant and food)

MAIN ARTICLE *volume 11 page 111*

MORE TO EXPLORE

cutting and threshing rye *picture, volume 11 page 111*

rye plants *picture, volume 11 page 111*

rye flour

rye *volume 11 page 111*



SA (Nazi organization): *see in index* Storm Troopers

Sabah family (Kuwaiti ruling family)

Kuwait *volume 7 page 91*

Sabbath (Judaism)

Judaism *volume 7 page 37*

saber-toothed cat (mammal subfamily)

extinct animals *volume 1 page 127*

Sabinio (extinct volcano in Central Africa)

Virunga Mountains *volume 14 page 97*

Sac (Native American people): *see in index* Sauk

Sacagawea (Native American explorer)

MAIN ARTICLE *volume 12 page 4, picture, volume 12 page 4*

MORE TO EXPLORE

Lewis and Clark Expedition *volume 7 page 137*

SACC (South African religious organization): *see in index* South African Council of Churches

saccharin (chemical compound)

sugar *volume 12 page 202*

sacrament (religious rite)

Roman Catholicism *volume 11 page 83*

Sacramento (state capital of California, U.S.)

MAIN ARTICLE *volume 12 page 5*

MORE TO EXPLORE

California *volume 3 page 11*

State Capitol *picture, volume 5*

page 133, picture, volume 12 page 5

sacred music: *see in index* religious music

Sadat, Anwar el- (president of Egypt)

MAIN ARTICLE *volume 12 page 5, picture, volume 12 page 6*

MORE TO EXPLORE

assassination *volume 1 page 211*

Egypt *volume 4 page 111*

Saddam Hussein (president of Iraq)

MAIN ARTICLE *volume 12 page 6, picture, volume 12 page 6*

MORE TO EXPLORE

Bush *volume 2 page 157*

Iran-Iraq War *volume 6 page 150*

Iraq *volume 6 page 153*

Persian Gulf War *volume 10 page 62*

terrorism *volume 13 page 49*

sadhu (Hindu ascetic)

saint *volume 12 page 9*

sadre (religious dress)

Zoroastrianism *volume 15 page 109*

Safavid Dynasty (Iranian dynasty)

Persia *volume 10 page 62*

safety (condition)

MAIN ARTICLE *volume 12 page 7, picture, volume 12 page 7*

MORE TO EXPLORE

automobile *volume 1 page 237*

safety (sports score)

football *volume 5 page 50*

safety warning

toy *volume 13 page 84*

saga (literature)

Vikings *volume 14 page 89*

sage (herb)

herb *volume 6 page 45*

Sagebrush State (state in the U.S.): *see in index* Nevada

Sagittarius (astronomy)

constellation *volume 3 page 188*

Lagoon Nebula *picture, volume 9 page 30*

zodiac signs *picture, volume 15 page 107*

saguaro (plant)

cactus *volume 3 page 6*

Tonto National Forest *picture, volume 10 page 75*

Sahara (desert in Africa)

MAIN ARTICLE *volume 12 page 8*

MORE TO EXPLORE

Algeria *volume 1 page 78*

palm trees in distant oasis *picture, volume 12 page 8*

Chad *volume 3 page 78*

desert *volume 4 page 40*

Mali *volume 8 page 32*

Mauritania *volume 8 page 79*

Niger *volume 9 page 67*

Sahel (region in Africa)

Chad *volume 3 page 78*

Sa'id, As- (region of the Nile Valley in Africa): *see in index* Upper Egypt

saiga (species of mammal)

antelope types *picture, volume 1 page 139*

Saigon (city in Vietnam): *see in index* Ho Chi Minh City

sail (watercraft part)

boat *volume 2 page 98*

navy *volume 9 page 26*

sailboat (watercraft) *picture, volume 7 page 102*

boat *volume 2 page 98, picture, volume 2 page 98*

race in Chesapeake Bay *picture, volume 8 page 69*

race on Lake Huron *picture, volume 5 page 147*

sailing (boating): *see in index* sailboat

sailplane (aircraft) *picture, volume 5 page 119*

Saimiri (primate): *see in index* squirrel monkey

saint (religion)

MAIN ARTICLE *volume 12 page 9, picture, volume 12 page 9*

MORE TO EXPLORE

common abbreviations *table, volume 1 page 8*

Roman Catholicism *volume 11 page 82*

Saint Andrew, Church of (church in Kiev, Ukraine) *picture, volume 7 page 63*

Saint Augustine (city in Florida, U.S.)

MAIN ARTICLE *volume 12 page 10, picture, volume 12 page 10*

MORE TO EXPLORE

United States *volume 14 page 27*

Saint Bartholomew's Day, Massacre of (French history)

Huguenots *volume 6 page 92*

Saint Basil, Cathedral of (church, Moscow, Russia) *picture, volume 4 page 94, picture, volume 8 page 186*

Moscow *volume 8 page 186*

Saint Bernard (breed of dog)

working dogs *table, volume 4 page 62*

Saint Christopher and Nevis (island country in the West Indies): *see in index* Saint Kitts and Nevis

Saint Clair, Lake (lake in Tasmania, Australia)

Tasmania *volume 13 page 19*

Saint Coleman's Cathedral (cathedral in Cobh, Ireland) *picture, volume 3 page 61*

Saint-Denis (capital city of Réunion, France)

Réunion *volume 11 page 56*

Saint-Domingue (former French colony in the West Indies): *see in index* Haiti

Saint George's (capital city of Grenada)

MAIN ARTICLE *volume 12 page 10, picture, volume 12 page 11*

MORE TO EXPLORE

Grenada *volume 5 page 160*

Saint Helens, Mount (volcano in Washington, U.S.) *picture, volume 5 page 97*

volcano *volume 14 page 102*

Saint Ignace (city in Michigan, U.S.)

Marquette *volume 8 page 57, picture, volume 7 page 31, picture, volume 8 page 57*

Saint Isaac's Cathedral (cathedral in Saint Petersburg, Russia)

Saint Petersburg *volume 12 page 16*

Saint Joe National Forest (national forest in Idaho, U.S.) *picture, volume 9 page 44*

Saint John's (capital city of Antigua and Barbuda)

MAIN ARTICLE *volume 12 page 11*

MORE TO EXPLORE

Antigua and Barbuda *volume 1 page 143*

Saint John's (provincial capital of Newfoundland and Labrador, Canada)

Newfoundland and Labrador *volume 9 page 45*

Saint Johns River (river in Florida, U.S.)

Florida *volume 5 page 34*

"Saint John the Evangelist" (painting by El Greco) *picture, volume 5 page 150*

Saint Kitts and Nevis (island country in the West Indies)

MAIN ARTICLE *volume 12 page 12*

Saint Lawrence, Gulf of (gulf in Canada)

Cartier *volume 3 page 49*

Saint Lawrence River (river in North America)

MAIN ARTICLE *volume 12 page 13, picture, volume 12 page 13*

MORE TO EXPLORE

Cartier *volume 3 page 48*

Champlain *volume 3 page 81*

Saint Lawrence Seaway (waterway in North America)

MAIN ARTICLE *volume 12 page 13*

MORE TO EXPLORE

Great Lakes *volume 5 page 148*

Erie *volume 4 page 149*

Huron *volume 6 page 103*

Michigan *volume 8 page 118*

Ontario *volume 9 page 141*

Ohio *volume 9 page 126*

Saint Louis (city in Missouri, U.S.)

Gateway Arch *picture, volume 8 page 146*

Saint Louis Cardinals (U.S. baseball team)

2004 World Series *picture, volume 2 page 30*

Saint Lucia (island country in the West Indies)

MAIN ARTICLE *volume 12 page 14, picture, volume 12 page 14*

Saint Mark's Basilica (church in Venice, Italy): *see in index* Basilica di San Marco

Saint Mark's Square (square in Venice, Italy): *see in index* San Marco, Piazza

Saint Marys River (river in North America)

Sault Sainte Marie canals *volume 12 page 46*

Saint Michael's Town (town in Barbados): *see in index* Bridgetown

Saint Naum, Monastery of (monastery, Macedonia) *picture, volume 8 page 5*

Saint Patrick's Day (feast day)

MAIN ARTICLE *volume 12 page 15, picture, volume 12 page 15*

Saint Paul (state capital of Minnesota, U.S.)

MAIN ARTICLE *volume 12 page 15, picture, volume 12 page 16*

MORE TO EXPLORE

Minnesota *volume 8 page 135*

Saint Paul, Cathedral of (cathedral in Saint Paul, Minnesota, U.S.) *picture, volume 12 page 16*

Saint Peter's Basilica (church in Vatican City)

"Pietà" *picture, volume 8 page 115*

Vatican City *volume 14 page 59*

Saint Petersburg (city in Russia)

MAIN ARTICLE *volume 12 page 16, picture, volume 12 page 17*

MORE TO EXPLORE

Hermitage museum *picture, volume 1 page 196*

Moscow *volume 8 page 187*

Peter the Great *volume 10 page 67*

Russian Revolution *volume 11*

page 108, picture, volume 11 page 108

Saint Sava Church (church in Belgrade, Serbia) *picture, volume 2 page 56*

Saints Peter and Paul, Cathedral of (cathedral in Saint Petersburg, Russia)

Saint Petersburg *volume 12 page 16*

Saint Valentine's Day: *see in index* Valentine's Day

Saint Vincent and the Grenadines

(island country in the West Indies)

MAIN ARTICLE *volume 12 page 18***Sakartvelo** (country in southwesternAsia): *see in index* Georgia, Republic of**Sakhy Shrine** (shrine in Kabul, Afghanistan)new year ceremony *picture, volume 7 page 43***saki** (monkey) *picture, volume 8 page 167***Sakkara** (archaeological site in Egypt): *see in index* Saqqarah**Sakti** (Hindu god): *see in index* Shakti**Saladin** (Muslim ruler)Crusades *volume 3 page 223***salamander** (amphibian order)MAIN ARTICLE *volume 12 page 19, picture, volume 12 page 19*

MORE TO EXPLORE

amphibian *volume 1 page 110***Salamis, Battle of** (Greek-Persian history)Persian Wars *volume 10 page 63***sale** (business): *see in index* selling**Salem** (city in Massachusetts, U.S.)Salem witch trials *volume 12 page 20***Salem** (state capital of Oregon, U.S.)MAIN ARTICLE *volume 12 page 19*

MORE TO EXPLORE

Oregon *volume 9 page 147*State Capitol *picture, volume 12 page 20***Salem witch trials** (American colonial history)MAIN ARTICLE *volume 12 page 20*

MORE TO EXPLORE

rye *volume 11 page 111*trial of two women *picture, volume 12 page 20***sales** (business): *see in index* selling**sales agent** (business)newspaper *volume 9 page 54***sales tax**tax *volume 13 page 21***saline lake**: *see in index* salt lake**Salisbury** (capital city of Zimbabwe): *see in index* Harare**Salish** (Native American people)British Columbia *volume 2 page 132***saliva** (biochemistry)digestive system *volume 4 page 47*mouth *volume 8 page 196***salivary gland** (anatomy)human digestive system *picture, volume 4 page 47*mumps *volume 8 page 206***salivary secretion** (biochemistry): *see in index* saliva**Salix** (plant genus): *see in index* willow**Salk, Jonas** (U.S. physician and researcher)MAIN ARTICLE *volume 12 page 21, picture, volume 12 page 21*

MORE TO EXPLORE

vaccine *volume 14 page 49***Salle, Sieur de La** (French explorer): *see in index* La Salle, Sieur de**salmon** (fish)MAIN ARTICLE *volume 12 page 22, picture, volume 12 page 22*

MORE TO EXPLORE

animal migration *volume 8 page 126***Salmonella** (bacteria) *picture, volume 5 page 46***salt** (acid-base reactions)acid and base *volume 1 page 17***salt** (sodium chloride)crystal *volume 3 page 226, picture, volume 3 page 226*Dead Sea *picture, volume 4 page 20*irrigation *volume 6 page 162*ocean *volume 9 page 117*salt flat *picture, volume 8 page 131***salt lake**Dead Sea *picture, volume 4 page 20*Great Salt Lake *picture, volume 14 page 45***Salt Lake City** (state capital of Utah, U.S.)MAIN ARTICLE *volume 12 page 23, picture, volume 12 page 23*

MORE TO EXPLORE

Mormon Temple *picture, volume 8 page 182*Utah *volume 14 page 44***Salto Angel** (waterfall in Venezuela): *see in index* Angel Falls**salt water**lake *volume 7 page 102***saltwater crocodile** (reptile): *see in index* estuarine crocodile**Salvia officinalis** (herb): *see in index* sage**Salzburg** (city in Austria) *picture, volume 1 page 234***samara** (plant reproductive body)elm *volume 4 page 128***Samarra** (city in Iraq)minaret of a mosque *picture, volume 6 page 151***Samaveda** (Hindu literature)Veda *volume 14 page 60***sambo** (sport)wrestling *volume 15 page 73***Samhain**: *see in index* Halloween**Sami** (people)father and son in traditional dress *picture, volume 9 page 98*Finland *volume 5 page 22, picture, volume 5 page 22*Norway *volume 9 page 97*reindeer *volume 11 page 42*Sweden *volume 12 page 213***Samoa** (island country in the Pacific Ocean)MAIN ARTICLE *volume 12 page 24*

MORE TO EXPLORE

village on the island of Savai'i *picture, volume 12 page 24***sample** (data gathering)statistics *volume 12 page 183***samurai** (Japanese warrior)MAIN ARTICLE *volume 12 page 25, picture, volume 12 page 25*

MORE TO EXPLORE

Japan's history *volume 7 page 14*martial arts *volume 8 page 64***San** (people)Kalahari *volume 7 page 45*Lesotho *volume 7 page 134*Namibia *volume 9 page 7***Sanaa** (capital city of Yemen)MAIN ARTICLE *volume 12 page 26, picture, volume 12 page 26*

MORE TO EXPLORE

Yemen *volume 15 page 90, picture, volume 15 page 90*

San Andreas Fault (geologic fault in North America)
earthquake *volume 4 page 92*

San Antonio (city in Texas, U.S.)
River Walk *picture, volume 13 page 52*

sand

MAIN ARTICLE *volume 12 page 26, picture, volume 12 page 27*

MORE TO EXPLORE

brick and tile *volume 2 page 128*

glass *volume 5 page 118*

sand dune *picture, volume 12 page 27*

soil *volume 12 page 125*

sand dune

MAIN ARTICLE *volume 12 page 27, picture, volume 12 page 27*

MORE TO EXPLORE

Algeria *picture, volume 1 page 78*

Death Valley *picture, volume 4 page 23*

desert *volume 4 page 40*

Lake Michigan *picture, volume 8 page 118*

Namibia *picture, volume 9 page 6*

sand *volume 12 page 27*

Texas *picture, volume 13 page 51*

San Diego (city in California, U.S.)
California missions *table, volume 8 page 140*
San Diego Zoo *picture, volume 15 page 107, picture, volume 15 page 108*

San Diego Zoo (zoo in San Diego, California, U.S.)
Hidden Jungle exhibit *picture, volume 15 page 107*

Sandinista (political and military organization in Nicaragua)
Nicaragua *volume 9 page 64*

sand painting

Navajo sand painting *picture, volume 9 page 23*

sandstone (rock)

rock *volume 11 page 76*

Treasury at Petra *picture, volume 7 page 34*

Sandstone Falls (waterfall in West Virginia, U.S.) *picture, volume 15 page 34*

sandstorm (weather): *see in index* dust storm

sand trap (golf): *see in index* bunker

Sandwich Islands (islands in the Pacific Ocean): *see in index* Hawaii

San Francisco (city in California, U.S.)
California missions *table, volume 8 page 140*
images
Golden Gate Bridge *picture, volume 3 page 12*
mural by Rivera *picture, volume 11 page 68*

San Francisco Bay (bay in California, U.S.)
Golden Gate Bridge *picture, volume 3 page 12*

San Francisco Giants (U.S. baseball team)
Mays *volume 8 page 84*

San Gabriel (city in California, U.S.)
California missions *table, volume 8 page 140*

sangha (Buddhism)
Buddha *volume 2 page 143*
Buddhism *volume 2 page 144*

San José (capital city of Costa Rica)
MAIN ARTICLE *volume 12 page 28, picture, volume 12 page 28*
MORE TO EXPLORE
Costa Rica *volume 3 page 203*

San Juan (capital city of Puerto Rico)
MAIN ARTICLE *volume 12 page 28, picture, volume 12 page 28*
MORE TO EXPLORE
Puerto Rico *volume 10 page 165*

San Juan Capistrano (city in California, U.S.)
California missions *table, volume 8 page 140*

San Luis Obispo (city in California, U.S.)
California missions *table, volume 8 page 140*

San Marco, Piazza (square in Venice, Italy)
Venice *volume 14 page 65*

San Marco Basilica (church in Venice, Italy): *see in index* Basilica di San Marco

San Marcos National Monument, Castillo de (monument in St. Augustine, Florida, U.S.): *see in index* Castillo de San Marcos National Monument

San Marino (country in Europe)
MAIN ARTICLE *volume 12 page 29, picture, volume 12 page 29*

San Marino (capital city of San Marino)
San Marino *volume 12 page 29*

San Martín, José de (Argentine revolutionary)
South America *volume 12 page 144*

San Rafael (city in California, U.S.)
California missions *table, volume 8 page 140*

San Rafael, Mount (mountain in Paraguay)
Paraguay *volume 10 page 30*

San Salvador (capital city of El Salvador)
MAIN ARTICLE *volume 12 page 30, picture, volume 12 page 30*
MORE TO EXPLORE
El Salvador *volume 4 page 129*

Santa Anna, Antonio López de (president of Mexico)
Gadsden Purchase *volume 5 page 80*
Mexico *volume 8 page 112*

Santa Barbara (city in California, U.S.)
California missions *table, volume 8 page 140*

Santa Catalina Island (island in California, U.S.)
island gray fox *picture, volume 2 page 73*

Santa Clara (city in California, U.S.)
California missions *table, volume 8 page 140*

Santa Claus (legendary person)
MAIN ARTICLE *volume 12 page 30, picture, volume 12 page 31*
MORE TO EXPLORE
Christmas *volume 3 page 115*

Santa Cruz (city in California, U.S.)
California missions *table, volume 8 page 140*

Santa Fe (state capital of New Mexico, U.S.)
MAIN ARTICLE *volume 12 page 31, picture, volume 12 page 31*
MORE TO EXPLORE
New Mexico *volume 9 page 51*
Santa Fe Trail *volume 12 page 33*

Santa Fe Museum of Fine Arts (museum in Santa Fe, New Mexico, U.S.) *picture, volume 12 page 31*

Santa Fe Trail (trade route in the U.S.)

MAIN ARTICLE *volume 12 page 32*

MORE TO EXPLORE

Santa Fe *volume 12 page 32*

“Santa María” (ship)

Columbus *volume 3 page 163*

Santa María la Menor, Cathedral of (cathedral, Santo Domingo, Dominican Republic) *picture, volume 12 page 34*

Santee (Native American people): *see in index* Dakota

Santiago (capital city of Chile)

MAIN ARTICLE *volume 12 page 33, picture, volume 12 page 33*

MORE TO EXPLORE

Chile *volume 3 page 98*

Santo Domingo (capital city of the Dominican Republic)

MAIN ARTICLE *volume 12 page 34*

MORE TO EXPLORE

Cathedral of Santa María la Menor *picture, volume 12 page 34*

Dominican Republic *volume 4 page 66*

Santos Football Club (Brazilian football club)

Pelé *volume 10 page 50*

San Vitale Basilica (church in Ravenna, Italy)

mosaic of Theodora *picture, volume 2 page 159*

São Paulo (state capital of São Paulo, Brazil)

MAIN ARTICLE *volume 12 page 35*

São Paulo fever (disease): *see in index* Rocky Mountain spotted fever

São Tomé (capital city of São Tomé and Príncipe)

MAIN ARTICLE *volume 12 page 35, picture, volume 12 page 36*

MORE TO EXPLORE

São Tomé and Príncipe *volume 12 page 36*

São Tomé and Príncipe (island country of Africa)

MAIN ARTICLE *volume 12 page 36, picture, volume 12 page 36*

sap (botany)

maple *volume 8 page 52*

sapphire (gemstone)

jewelry and gems *volume 7 page 24*

saprophyte (type of fungus)

fungus *volume 5 page 75*

sapsucker (bird)

woodpecker *volume 15 page 59*

Saqqarah (archaeological site in Egypt)

pyramid *picture, volume 1 page 168*

Sarajevo (capital city of Bosnia and Herzegovina)

MAIN ARTICLE *volume 12 page 37, picture, volume 12 page 37*

MORE TO EXPLORE

Bosnia and Herzegovina *volume 2 page 112*

Saratoga, Battles of (American Revolution, 1777)

American Revolution *volume 1 page 101*

General Burgoyne surrenders *picture, volume 1 page 101*

Sarcee (Native American people)

MAIN ARTICLE *volume 12 page 37, picture, volume 12 page 38*

SARS (respiratory disease)

MAIN ARTICLE *volume 12 page 38, picture, volume 12 page 38*

MORE TO EXPLORE

epidemic *volume 4 page 146, picture, volume 4 page 146*

Sarsi (Native American people): *see in index* Sarcee

Sasanian (people)

Persia *volume 10 page 61*

Saskatchewan (province in Canada)

MAIN ARTICLE *volume 12 page 39*

MORE TO EXPLORE

geography

Regina *picture, volume 12 page 40*

wheat field *picture, volume 12 page 40*

Sasquatch (legendary creature)

legendary animals *volume 1 page 129*

Sassacus (Pequot chief)

Mohegan *volume 8 page 152*

Satchmo (U.S. musician): *see in index*

Armstrong, Louis

satellite (natural or artificial orbiting object)

MAIN ARTICLE *volume 12 page 41*

MORE TO EXPLORE

artificial satellite

images of Hurricane Katrina *picture, volume 15 page 28*

television broadcasting *volume 13 page 41, picture, volume 13 page 40*

natural satellite

Earth *volume 4 page 90*

planets *volume 10 page 92*

Saturn *volume 12 page 42*

Uranus *volume 14 page 39*

satellite dish (electronics)

television *volume 13 page 41*

satellite radio

radio *volume 11 page 19*

satellite television (broadcasting)

transmission *picture, volume 13 page 40*

Saturn (planet)

MAIN ARTICLE *volume 12 page 41, picture, volume 12 page 42*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*

solar system *volume 12 page 127, picture, volume 12 page 127*

Sa‘ud family (Arabian dynasty)

Riyadh *volume 11 page 69*

Saudi Arabia (country in the Middle East)

MAIN ARTICLE *volume 12 page 43*

MORE TO EXPLORE

geography

Arabian Peninsula *volume 1 page 156*

Asia *volume 1 page 200*

people and culture

garden in Riyadh *picture, volume 11 page 69*

Internet café *picture, volume 12 page 44*

irrigation *picture, volume 6 page 161*

Kingdom Centre building *picture, volume 12 page 45*

King’s Camel Race *picture, volume 12 page 44*

petroleum plant *picture, volume 8 page 124*

timeline *volume 12 page 43*

Sauk (Native American people)

MAIN ARTICLE *volume 12 page 46, picture, volume 12 page 46*

MORE TO EXPLORE

Black Hawk *volume 2 page 86*
 Fox *volume 5 page 57*

Sauk and Fox tribe (Native American peoples)
 Fox *volume 5 page 57*

Sault Sainte Marie (city in Ontario, Canada)
 Sault Sainte Marie canals *volume 12 page 46*

Sault Sainte Marie (city in Michigan, U.S.)
 Sault Sainte Marie canals *volume 12 page 47*

Sault Sainte Marie canals (canals in North America)
 MAIN ARTICLE *volume 12 page 46*

Saurischia (dinosaur order)
 dinosaur *volume 4 page 51*, *picture, volume 4 page 50*

sauropod (dinosaur infraorder)
 dinosaur *volume 4 page 51*

Savai'i (island in Samoa)
 village on the island of Savai'i *picture, volume 12 page 24*

savanna (life zone)
 biome *volume 2 page 74*
 grassland *volume 5 page 143*
 places
 Africa *volume 1 page 40*, *picture, volume 5 page 143*
 South America *volume 12 page 140*
 tropics *volume 13 page 99*

Savannah (city in Georgia, U.S.)
 oak trees covered with Spanish moss
picture, volume 5 page 102

saving (economics)
 banking *volume 2 page 24*

sawfish (fish)
 ray *volume 11 page 30*

saw grass (plant)
 Everglades *volume 4 page 168*

Saxon (people)
 Alfred the Great *volume 1 page 76*
 Anglo-Saxon *volume 1 page 121*
 Holy Roman Empire *volume 6 page 75*

saxophone (musical instrument)
 wind instruments *picture, volume 8 page 217*

“Say Hey Kid” (U.S. baseball player): *see in index* Mays, Willie

scalawag (U.S. history)
 Reconstruction *volume 11 page 34*

scald (injury)
 MAIN ARTICLE *volume 2 page 152*

scale (animal anatomy)
 lizard *volume 7 page 169*
 reptile *volume 11 page 51*
 snake *volume 12 page 112*
 adder *picture, volume 11 page 51*

scale (mapmaking)
 map and globe *volume 8 page 49*

scallop (mollusk)
 bivalve *volume 2 page 84*
 shell *picture, volume 2 page 83*

scalpel (medical instrument)
 laser *volume 7 page 111*
 surgery *volume 12 page 207*

Scandinavia (region in northern Europe)
 Denmark *volume 4 page 37*
 Odin *volume 9 page 124*
 Sweden *volume 12 page 212*
 World War II *volume 15 page 66*

scarlet fever (disease)
 MAIN ARTICLE *volume 12 page 47*, *picture, volume 12 page 47*

scarlet ibis (bird)
 Trinidad and Tobago *volume 13 page 97*

scarlet king snake (reptile)
 various snakes *picture, volume 12 page 113*

Schism of 1054 (Christianity)
 Byzantine Empire *volume 2 page 159*

Schitsu'umsh (Native American people):
see in index Coeur d'Alene

schizophrenia (psychology)
 mental illness *volume 8 page 100*

Schönbrunn Palace (palace in Vienna, Austria)
picture, volume 14 page 82

school (animal behavior)
 Yellowspot emperor fish *picture, volume 5 page 27*

school (educational facility)
 education *volume 4 page 105*
 students in classroom *picture, volume 4 page 106*

school age (growth stage)
 child development *volume 3 page 97*

school library (education)
 librarian with students *picture, volume 7 page 142*
 library *volume 7 page 142*

school system
 education *volume 4 page 106*

school teaching: *see in index* teaching

Schulz, Charles (U.S. cartoonist)
 MAIN ARTICLE *volume 12 page 48*, *picture, volume 12 page 48*

MORE TO EXPLORE
 working on cartoon *picture, volume 3 page 49*

Schwarzkopf, H. Norman (U.S. general)
 Persian Gulf War, 1991 *picture, volume 10 page 62*

Schwarzwald (mountainous region in Germany): *see in index* Black Forest

science
 MAIN ARTICLE *volume 12 page 49*

MORE TO EXPLORE
 Enlightenment *volume 4 page 142*
 medical researchers working in a laboratory *picture, volume 12 page 49*
 Renaissance *volume 11 page 45*
 science fair project *picture, volume 12 page 50*
 submarine *volume 12 page 196*

science fiction (literature)
 MAIN ARTICLE *volume 12 page 50*

MORE TO EXPLORE
 robot *volume 11 page 75*
 “Star Trek III: The Search for Spock”
picture, volume 12 page 50
 utopia *volume 14 page 46*

science museum
 cloud exhibit *picture, volume 8 page 211*
 museum *volume 8 page 211*

scientific method
 science *volume 12 page 49*

scientific satellite (artificial orbiting object)
 satellite *volume 12 page 41*

sci-fi (literature): *see in index* science fiction

Scioto River (river in the U.S.)
 Columbus *picture, volume 3 page 162*

*To learn more about science,
look for these articles:*

<u>LIFE SCIENCES</u>	Atmosphere
Anatomy	Atom
Biology	Color
Botany	Conservation
Ecology	Crystal
Genetics	Ecosystem
Medicine	Electricity
Zoology	Energy
	Environment
<u>PHYSICAL SCIENCES</u>	Evolution
Astronomy	Force
Chemistry	Global Warming
Geology	Gravity
Mathematics	Greenhouse Effect
Physics	Human Origins
	Lens
<u>SOCIAL SCIENCES</u>	Light
Anthropology	Living Thing
Archaeology	Matter
Economics	Molecule
Geography	Motion
Psychology	Optics
Social Science	Pollution
Sociology	Recycling
	Sound
<u>OTHER SCIENCE TOPICS</u>	Technology and Invention
Acid and Base	Water
Acid Rain	Weather
Adaptation	Wind
Air	
Artificial Intelligence	

SCLC (U.S. organization): *see in index* Southern Christian Leadership Conference

sclera (part of eye)
eye *volume 4 page 175*, picture, *volume 4 page 175*

scoring (sports)
rugby *volume 11 page 103*

Scorpio (astrology): *see in index* Scorpius

scorpion (arachnid)
MAIN ARTICLE *volume 12 page 51*, picture, *volume 12 page 51*

Scorpius (astronomy)
constellation *volume 3 page 188*
zodiac signs picture, *volume 15 page 107*

Scot (ancient people)
Scotland *volume 12 page 53*

Scotland (part of the United Kingdom)
MAIN ARTICLE *volume 12 page 52*

MORE TO EXPLORE

England *volume 4 page 139*

golf *volume 5 page 126*

images

Scottish Exhibition and Conference

Centre picture, *volume 14 page 17*

Urquhart Castle picture, *volume 12 page 52*

Northern Ireland *volume 9 page 90*

United Kingdom *volume 14 page 16*

Scots pine (tree)
conifers picture, *volume 3 page 183*

Scott, Coretta (U.S. civil-rights activist):
see in index King, Coretta Scott

Scott, Dred (U.S. slave) picture, *volume 4 page 77*
Dred Scott decision *volume 4 page 77*

Scott, Robert F. (English officer and explorer)
Antarctica *volume 1 page 137*
polar exploration *volume 10 page 111*

Scottie (breed of dog): *see in index* Scottish terrier

Scottish Exhibition and Conference Centre (building in Glasgow, Scotland, United Kingdom) picture, *volume 14 page 17*

Scottish Highlands (region in Scotland, United Kingdom): *see in index* Highlands

Scottish Parliament (government in Scotland, United Kingdom)
Scotland *volume 12 page 53*

Scottish terrier (breed of dog)
terrier breeds table, *volume 4 page 62*

scouting (youth group activity)
MAIN ARTICLE *volume 12 page 53*

MORE TO EXPLORE

Cub Scout gathering newspapers for recycling picture, *volume 12 page 53*

Indonesian Girl Scouts picture, *volume 12 page 54*

Scouts (youth organization): *see in index* Boy Scouts

screech owl (bird) picture, *volume 2 page 80*

screenwriting (filmmaking)
movie *volume 8 page 198*

screw (machine component)
machine *volume 8 page 6*, picture, *volume 8 page 6*

Screw Auger Falls (waterfall in Maine, U.S.) picture, *volume 1 page 151*

“Screwtape Letters, The” (book by Lewis)
Lewis *volume 7 page 137*

scrimmage, line of (sports)
football *volume 5 page 49*

script: *see in index* screenwriting; writing

scroll painting (art)
Chinese scrolls picture, *volume 10 page 9*

scrotum (anatomy) picture, *volume 11 page 47*
reproductive system *volume 11 page 48*

scrum (sports)
rugby *volume 11 page 103*

scull (watercraft)
boat *volume 2 page 98*

sculling (sport): *see in index* scull

sculptor: *see in index* sculpture

sculpture
MAIN ARTICLE *volume 12 page 54*

MORE TO EXPLORE

abstract sculpture by Hepworth picture, *volume 12 page 57*

brass *volume 2 page 123*

bronze *volume 2 page 134*

Hermitage picture, *volume 1 page 196*

Olmec head picture, *volume 9 page 132*

Picasso's work in Chicago picture, *volume 10 page 79*

sculptor at work picture, *volume 12 page 55*

stone angel in Rome picture, *volume 12 page 55*

sculpture in the round (three-dimensional sculpture)
sculpture *volume 12 page 55*

SDI (United States defense system): *see in index* Strategic Defense Initiative

sea (body of water): *see in index* Aral Sea; Baltic Sea; Bering Sea; Black Sea; Caribbean Sea; Caspian Sea; Dead Sea; Mediterranean Sea; North Sea; Red Sea

sea, inland (physical feature): *see in index* lake

sea anemone (invertebrate order)

MAIN ARTICLE *volume 12 page 57*

MORE TO EXPLORE

anemone fish *picture, volume 5 page 28*

jewel anemone *picture, volume 12 page 57*

sea bass (fish)

bass *volume 2 page 37*

sea battle: *see in index* naval warfare

seabed: *see in index* ocean floor

sea cave (geology)

cave *volume 3 page 63*

sea eagle (bird)

eagle *volume 4 page 86*

sea elephant (mammal): *see in index*

elephant seal

seafloor: *see in index* ocean floor

sea horse (fish)

MAIN ARTICLE *volume 12 page 58, picture, volume 12 page 58*

sea ice (ice formation)

Arctic Ocean *volume 1 page 173*

Sea Knight helicopter (U.S. military

aircraft) *picture, volume 8 page 56*

seal (mammal)

MAIN ARTICLE *volume 12 page 59, picture, volume 12 page 59, picture, volume 12 page 59*

seal (art)

Indus Valley Civilization *picture, volume 6 page 136*

seal engraving (art): *see in index* seal

sea lion (mammal) *picture, volume 12*

page 59

seal *volume 12 page 59*

seaplane (aircraft) *picture, volume 1*

page 53

airplane *volume 1 page 53*

Sears Tower (building in Chicago, Illinois, U.S.): *see in index* Willis Tower

sea-run trout (fish): *see in index* rainbow

trout

sea serpent (mythical beast)

legendary animals *volume 1 page 128*

seashell

chalk *volume 3 page 79*

sea snake (snake)

MAIN ARTICLE *volume 12 page 60*

MORE TO EXPLORE

banded sea krait *picture, volume 12*

page 60

season (meteorological division)

MAIN ARTICLE *volume 12 page 60, picture, volume 12 page 61*

MORE TO EXPLORE

Demeter *volume 4 page 34*

Earth *volume 4 page 90*

Hades *volume 6 page 5*

sea stack (rock formation)

off the coast of Australia *picture, volume 14 page 78*

sea star (class of echinoderm): *see in index*

starfish

seat belt (safety device)

automobile *volume 1 page 237, picture, volume 12 page 7*

Seattle (city in Washington, U.S.)

trans-Pacific container ship *picture, volume 10 page 5*

sea turtle (reptile)

turtle *volume 13 page 117*

sea wasp (marine invertebrate)

jellyfish *volume 7 page 20*

sea water: *see in index* salt water

seaweed

farming *picture, volume 7 page 71*

Seb (Egyptian god): *see in index* Geb

second (unit of time)

time *volume 13 page 67*

secondary battery (electronics)

battery *volume 2 page 40*

secondary bow (multicolored arc in the sky)

rainbow *volume 11 page 23, picture, volume 11 page 22*

secondary consumer (biology)

food chain *volume 5 page 45*

secondary education

education *volume 4 page 106*

secondary rainbow (multicolored arc in

the sky): *see in index* secondary bow

secondary school: *see in index* secondary education

secondary tooth (anatomy): *see in index* permanent tooth

Second Battle of Wounded Knee (U.S.

history, 1973): *see in index* Wounded Knee, Second Battle of

Second Crusade (European, Christian and Islamic history): *see in index* Crusades

second-degree burn (injury)

burn and scald *volume 2 page 152*

second position (ballet)

ballet positions *picture, volume 2 page 14*

Second Reich (historic country in Europe): *see in index* German Empire

Second Seminole War (U.S. history, 1835–42)

Osceola *volume 9 page 153*

Seminole *volume 12 page 64*

Tyler *volume 13 page 124*

Van Buren *volume 14 page 55*

Second Temple (Judaism): *see in index* Jerusalem, Temple of

Secretariat (United Nations)

United Nations *volume 14 page 23*

Secret Intelligence Service (British government)

spy *volume 12 page 170*

section (mathematics)

map and globe *volume 8 page 51*

security (finance)

stock exchange *volume 12 page 185*

security and protection system

X-ray machine at airport *picture, volume 15 page 82*

Security Council (United Nations)

United Nations *volume 14 page 22*

security system: *see in index* security and protection system

seder (Judaism)

family and friends gather *picture, volume 10 page 40*

Passover *volume 10 page 40*

sedimentary rock (geology)

rock *volume 11 page 76*

seed (plant reproductive part)

MAIN ARTICLE *volume 12 page 62*

MORE TO EXPLORE

bean plant *picture, volume 10 page 96*

fruit *volume 5 page 72*

images

almond fruits *picture, volume 1 page 88*

Lawson cypress and English elm *picture, volume 13 page 94*

papaya *picture, volume 10 page 27*

pea *picture, volume 7 page 125, picture, volume 10 page 42*

Pomo woman *picture, volume 10 page 120*

sorghum *picture, volume 12 page 133*

plant *volume 10 page 95*

shell *volume 12 page 80*

seed coat (botany)

seed *volume 12 page 62*

Seeing Eye dog: *see in index* guide dog

Sef dynasty (African history)

Kanem-Bornu Empire *volume 7 page 46*

segmented worm (animal)

worm *volume 15 page 71*

segregation (social practice)

apartheid *volume 1 page 144, picture, volume 1 page 145*

United States

African Americans *volume 1 page 43*

civil rights movement *volume 3 page 129*

National Association for the Advancement of Colored People *volume 9 page 14*

people

Abernathy *volume 1 page 9*

Anderson *volume 1 page 117*

Evers *volume 4 page 169*

Marshall *volume 8 page 61*

Meredith *volume 8 page 103*

Parks *volume 10 page 36*

Tuskegee Airmen *volume 13 page 118*

Wells-Barnett *volume 15 page 29*

places

Alabama *picture, volume 8 page 177*

Seine River (river in France)

continental island *picture, volume 6 page 167*

Paris *volume 10 page 34*

seismic sea wave (giant wave): *see in index* tsunami

seismograph (device for measuring earthquakes)

earthquake *volume 4 page 93*

sei whale (mammal)

whale species *picture, volume 15 page 37*

seizure (medical disorder)

epilepsy *volume 4 page 147*

Sela (ancient city in Jordan): *see in index* Petra

Selective Service Act (U.S. legislation, 1917)

Wilson *volume 15 page 47*

self-pollination (botany) *picture, volume 10 page 116*

flower *volume 5 page 38*

pollen *volume 10 page 116*

"Self-Portrait with Straw Hat" (painting by Van Gogh) *picture, volume 14 page 56*

Seljuk Turks (Turkish dynasty)

Crusades *volume 3 page 223*

Islam *volume 6 page 165*

Turkey *volume 13 page 112*

Selle, Mount (mountain in Haiti)

elevation *volume 6 page 8*

selling (business)

advertising *volume 1 page 32*

selva (region in South America): *see in index* montaña

semen (biochemistry)

reproductive system *volume 11 page 48*

semicircular canal (anatomy)

ear *volume 4 page 87, picture, volume 4 page 87*

semiconductor (electronics)

electronics *volume 4 page 123*

semifinished material (industry): *see in index* raw material

Seminole (Native American people)

MAIN ARTICLE *volume 12 page 63*

MORE TO EXPLORE

Everglades *volume 4 page 168*

Florida *volume 5 page 36*

Osceola *volume 9 page 153*

Seminole traditional dress *picture, volume 12 page 64*

Seminole Wars (U.S. history): *see in index* First Seminole War; Second Seminole War; Third Seminole War

Semitic alphabet, North: *see in index* North Semitic

Senate (Roman history)

ancient Rome *volume 11 page 89*

republic *volume 11 page 54*

Senate (U.S. government)

Supreme Court nominee hearing *picture, volume 14 page 36*

United States government *volume 14 page 33*

Sendak, Maurice (U.S. artist and author)

MAIN ARTICLE *volume 12 page 64, picture, volume 12 page 64*

MORE TO EXPLORE

"Where the Wild Things Are" costumes *picture, volume 4 page 72*

Seneca (Native American people)

MAIN ARTICLE *volume 12 page 65*

MORE TO EXPLORE

Cornplanter *picture, volume 12 page 65*

Hiawatha *volume 6 page 49*

Iroquois *volume 6 page 160*

Senegal (country in Africa)

MAIN ARTICLE *volume 12 page 66, picture, volume 12 page 66, picture, volume 12 page 67*

MORE TO EXPLORE

Wolof Empire *volume 15 page 54*

Senegambia (confederation in Africa)

Gambia *volume 5 page 84*

Senegal *volume 12 page 67*

Sengen Shrine (shrine in Fujinomiya, Japan)

Mount Fuji *volume 5 page 74*

Senghor, Léopold (president of Senegal)

Senegal *volume 12 page 66*

Senior (father with same name as son)

common abbreviations *table, volume 1 page 8*

senses

MAIN ARTICLE *volume 12 page 68, picture, volume 12 page 68, picture, volume 12 page 68*

MORE TO EXPLORE

living thing *volume 7 page 168*

reptile *volume 11 page 52*

sensory nerve (anatomy) *picture, volume 9 page 36*
nervous system *volume 9 page 35*

sensory receptor (sense cell): *see in index* receptor

sentence (grammar)
language *volume 7 page 105*

Seoul (capital city of South Korea)
MAIN ARTICLE *volume 12 page 69, picture, volume 7 page 82*
MORE TO EXPLORE

images
Christmas tree *picture, volume 3 page 114*
Kyongbokkung Palace *picture, volume 12 page 69*
South Korea *volume 7 page 82*

sepal (flower part)
cabbage *volume 3 page 4*

separation of powers (political science and government): *see in index* powers, separation of

Separatist (religious group)
“Mayflower” *volume 8 page 83*
Plymouth Colony *volume 10 page 102*
Puritan *volume 10 page 168*

September 11 attacks (U.S. history, 2001)
bin Laden *volume 2 page 71*
Bush *volume 2 page 157*
damaged Pentagon building *picture, volume 13 page 49*
New York *volume 9 page 59*

septicemic plague (disease)
plague *volume 10 page 92*

Sequoia (tree genus)
MAIN ARTICLE *volume 12 page 70*

Sequoia National Park (national park in California, U.S.)
giant sequoia trees *picture, volume 5 page 113*

Sequoyah (Cherokee leader)
MAIN ARTICLE *volume 12 page 70, picture, volume 12 page 70*
MORE TO EXPLORE
Cherokee *volume 3 page 88*

“Serapis” (British naval ship)
Jones *volume 7 page 32, picture, volume 7 page 32*

Serb (people)
Belgrade *volume 2 page 56*
Serbia *volume 12 page 71*

Serbia (historical republic of Serbia and Montenegro)
Belgrade *picture, volume 12 page 72*

Serbia (country in Europe)
MAIN ARTICLE *volume 12 page 71, picture, volume 12 page 72*
MORE TO EXPLORE

history
Kosovo *volume 7 page 86*
Montenegro *volume 8 page 175*
World War I *volume 15 page 61*
Yugoslavia *volume 15 page 95*

Serbia and Montenegro (historic country in Europe)
Yugoslavia *volume 15 page 96*

Serbs, Croats, and Slovenes, Kingdom of (historical kingdom in Europe, 1918–29)
Yugoslavia *volume 15 page 95*

Serengeti National Park (park in Tanzania)
Tanzania *volume 13 page 15*

Serengeti Plain (region in Tanzania)
Tanzania *volume 13 page 15*

serfdom
feudalism *volume 5 page 14*
labor *volume 7 page 96*
Middle Ages *volume 8 page 122*
serfs giving animals to their lord *picture, volume 5 page 14*
serfs working in the Middle Ages *picture, volume 7 page 96*
slavery *volume 12 page 105*
Ukraine *volume 14 page 7*

serpent eagle (bird)
eagles *volume 4 page 86*

Serpent Mound (earthwork in Ohio, U.S.) *picture, volume 8 page 194*

Serra, Junípero (Spanish Franciscan missionary)
MAIN ARTICLE *volume 12 page 73*
MORE TO EXPLORE
Spanish missions *volume 8 page 140*

serve (sports)
tennis *volume 13 page 45*
volleyball *volume 14 page 104*

service (task done for another person)
economics *volume 4 page 100*
trade *volume 13 page 87*

service dog: *see in index* guide dog

service industry
industry *volume 6 page 134*

“Sesame Street” (U.S. television program)
Henson *volume 6 page 41*

Set (Egyptian god): *see in index* Seth

set (tennis)
tennis *volume 13 page 46*

set design (theater and filmmaking)
theater *volume 13 page 58*

Seth (Egyptian god)
Isis and Osiris *volume 6 page 163*

settlement colony (colonialism)
colony *volume 3 page 154*

settlement of the Americas: *see in index* Americas

Seurat, Georges (French painter)
painting *volume 10 page 10*

Seuss, Dr. (U.S. author and illustrator)
MAIN ARTICLE *volume 12 page 73, picture, volume 12 page 73*

MORE TO EXPLORE
literature for children *volume 7 page 164*

seven-spotted ladybug (insect)
types of beetles *picture, volume 2 page 49*

17-year cicada (insect)
locust *volume 7 page 173*

seventeen-year locust (insect): *see in index* 17-year cicada

Seventh Crusade (European, Christian and Islamic history): *see in index* Crusades

severe acute respiratory syndrome (respiratory disease): *see in index* SARS

Seville orange (fruit): *see in index* sour orange

Seward, William H. (U.S. government official)
Alaska *volume 1 page 64*

sewing

shop in Kinshasa *picture, volume 7 page 69*

sewing machine

shop in Kinshasa *picture, volume 7 page 69*

sex cell (biology): *see in index* gamete

sextant (navigation instrument) *picture, volume 9 page 25*

sexual reproduction (biology)

reproductive system *volume 11 page 47*

Seychelles (island country in the Indian Ocean)

MAIN ARTICLE *volume 12 page 74, picture, volume 12 page 74*

MORE TO EXPLORE

tropical forest *picture, volume 5 page 54*
Victoria *picture, volume 14 page 79*

Seychellois Creole (people)

Seychelles *volume 12 page 74*

Seymour, Jane (queen of England): *see in index* Jane Seymour

Shabazz, el-Hajj Malik el- (U.S. Muslim leader): *see in index* Malcolm X

Shabbat (Judaism): *see in index* Sabbath

Shackleton, Ernest Henry (English explorer)

Antarctica *volume 1 page 137*

polar exploration *volume 10*

page 111

shaddock (plant)

citrus fruits *volume 3 page 123*

shaft (animal anatomy)

feather *volume 5 page 8, picture, volume 5 page 8*

shagbark hickory (tree) *picture, volume 6 page 51*

hickory *volume 6 page 50*

Shah, Birendra (king of Nepal)

Nepal *volume 9 page 32*

Shah, Prithvi Narayan (king of Nepal)

Nepal *volume 9 page 32*

shahadah (Islam)

Muslim statement of faith in Arabic calligraphy *picture, volume 8 page 203*

Shah Jahan (Mughal emperor)

Mughal Empire *volume 8 page 202*

Taj Mahal *volume 13 page 11*

Shakespeare, William (English author)

MAIN ARTICLE *volume 12 page 75, picture, volume 12 page 75*

MORE TO EXPLORE

drama *volume 4 page 73*

Shakti (Hindu god)

Hinduism *volume 6 page 56*

shamrock (plant)

MAIN ARTICLE *volume 12 page 76, picture, volume 12 page 76*

MORE TO EXPLORE

Saint Patrick's Day *volume 12 page 15*

Shangdu (city in Mongolia)

Polo *volume 10 page 119*

Shang Dynasty (Chinese history, 1766-1122 BC)

China *volume 3 page 102*

Shanghai (city in China)

automated teller machine in Shanghai, China *picture, volume 2 page 25*

Shang-tu (city in Mongolia): *see in index* Shangdu

Shantungosaurus (dinosaur)

dinosaurs in scale *picture, volume 4 page 53*

Sharchops (Asian people)

Bhutan *volume 2 page 66*

share (finance): *see in index* stock

shark (fish)

MAIN ARTICLE *volume 12 page 76, picture, volume 12 page 76, picture, volume 12 page 77*

MORE TO EXPLORE

sensory reception *picture, volume 12 page 68*

symbiosis *volume 12 page 222, picture, volume 12 page 221*

vertebrate embryo development *picture, volume 5 page 109*

Sharp, Granville (English scholar and philanthropist)

Freetown *volume 5 page 65*

sharp-shinned hawk (bird)

hawk *volume 6 page 28*

Shasta daisy (flowering plant)

daisy *volume 4 page 6*

Shatt Al-'Arab (river in Iraq)

Euphrates River *volume 4 page 159*

Tigris River *volume 13 page 66*

Shauhaunapotinia (Iowa chief) *picture, volume 6 page 144*

Shaw, George Bernard (Irish dramatist)

drama *volume 4 page 74*

Shawnee (Native American people)

MAIN ARTICLE *volume 12 page 78, picture, volume 12 page 78*

MORE TO EXPLORE

Algonquian *volume 1 page 80*

Tecumseh *volume 13 page 29*

West Virginia *volume 15 page 35*

sheep (mammal)

MAIN ARTICLE *volume 12 page 78*

MORE TO EXPLORE

goat *volume 5 page 121*

images

ewe with two lambs *picture, volume 12 page 78*

grazing in the Cotswolds *picture, volume 4 page 140*

Swaledale *picture, volume 12 page 79*

New Zealand *volume 9 page 62*

sheepberry (tree)

viburnum *volume 14 page 76*

sheep laurel (shrub)

laurel *volume 7 page 116*

shelf fungus (organism): *see in index* bracket fungus

shell (animal anatomy)

MAIN ARTICLE *volume 12 page 79, picture, volume 12 page 79*

MORE TO EXPLORE

mollusk *volume 8 page 157*

bivalve *volume 2 page 84*

pearls *picture, volume 7 page 24*

scallop *picture, volume 2 page 83*

turtle *volume 13 page 117*

shell (watercraft): *see in index* scull

shellbark hickory (tree)

hickory *volume 6 page 50*

Shenandoah National Park (national park in Virginia, U.S.)

Blue Ridge Mountains *picture, volume 14 page 94*

Shepard, Alan B., Jr. (U.S. astronaut)

space exploration *volume 12 page 151*

Sherman, William Tecumseh (U.S. general)
 American Civil War *volume 1 page 97*
 Georgia *volume 5 page 102*

Sherman Antitrust Act (U.S. legislation, 1890)
 Harrison *volume 6 page 22*

Sherpa (people)
 Hillary *volume 6 page 54*
 Himalayas *volume 6 page 55*
 Mount Everest *volume 4 page 167*
 Tenzing Norgay *volume 13 page 46*

Shi'ah (Islam)
 Caliphate *volume 3 page 14*
 Iran *volume 6 page 148*
 Islam *volume 6 page 164*
 Kurds *volume 7 page 90*
 martyr *volume 8 page 67*

Shibuya (district in Tokyo, Japan) *picture, volume 13 page 76*

shield (armor) *picture, volume 15 page 9*

shield fern (fern genus) *picture, volume 5 page 12*

shield volcano (landform)
 volcano *volume 14 page 101, picture, volume 14 page 101*

Shi'ite (Islam): *see in index* Shi'ah

Shiloh, Battle of (1862, American Civil War)
 American Civil War *volume 1 page 96*

Shinjuku (district in Tokyo, Japan)
 Tokyo *volume 13 page 76*

Shinto (religion)
 MAIN ARTICLE *volume 12 page 80*
 MORE TO EXPLORE

Japan *volume 7 page 13*
 Meiji Shrine *picture, volume 8 page 95*
 Shinto temple *picture, volume 12 page 80*

Shintoist (religious adherent)
 Shinto *volume 12 page 80*

ship (large watercraft)
 MAIN ARTICLE *volume 12 page 81*
 MORE TO EXPLORE
 aircraft carrier *picture, volume 12 page 82*
 cargo ship *picture, volume 12 page 81*
 cruise ship *picture, volume 12 page 82*
 ocean liner *picture, volume 13 page 93*

passenger ship *picture, volume 9 page 24*
 "Lusitania" *picture, volume 7 page 185*
 Valletta *picture, volume 14 page 52*
 Phoenician ship *picture, volume 10 page 74*
 ship from Venice, Italy *picture, volume 5 page 31*

ship navigation
 navigation *volume 9 page 23*

shipping (of goods)
 Canadian port *picture, volume 13 page 87*
 freight train *volume 11 page 20*

shipping (water transportation)
 harbor *volume 6 page 17*
 iceberg *volume 6 page 107*
 North Sea *volume 9 page 92*
 Northwest Passage *volume 9 page 93*

Shira (volcano in Tanzania)
 Mount Kilimanjaro *volume 7 page 65*

Shiva (Hindu god): *see in index* Siva

Shlomo (king of Israel): *see in index* Solomon

shock (medical condition)
 burn and scald *volume 2 page 152*

shock wave (physics)
 earthquake *volume 4 page 91*
 radiation *volume 11 page 17*

shofar (musical instrument) *picture, volume 15 page 94*
 Rosh Hashana *picture, volume 11 page 98*

shogun (Japanese title)
 Meiji *volume 8 page 95*
 samurai *volume 12 page 25*

shogunate (Japanese history)
 Japan *volume 7 page 14*

Shona (people)
 Great Zimbabwe *volume 5 page 149*
 Zimbabwe *volume 15 page 105*

shooting star (astronomy): *see in index* meteor

shoplifting (crime)
 sign *picture, volume 3 page 216*

shorebird: *see in index* wading bird

shoreline (landform): *see in index* coastline

short-nosed echidna (mammal) *picture, volume 4 page 97*
 echidna *volume 4 page 97*

shortsightedness (visual disorder): *see in index* nearsightedness

short story (literature)
 fiction *volume 5 page 18*

short-tailed weasel (mammal): *see in index* stoat

short-term memory (mental function)
 memory *volume 8 page 98*

short-track speed skating (sport)
 ice skating *volume 6 page 110*

shortwave radio (communications)
 telecommunication antennas *picture, volume 13 page 34*

Shoshone (Native American people)
 MAIN ARTICLE *volume 12 page 83, picture, volume 12 page 83*

MORE TO EXPLORE
 Comanche *volume 3 page 164*
 Lewis and Clark Expedition *volume 7 page 138*
 Native Americans *volume 9 page 18*
 Sacagawea *volume 12 page 4*
 Wyoming *volume 15 page 80*

shot put (athletics)
 track and field *volume 13 page 86, picture, volume 13 page 85*

Show Me State (state in the U.S.): *see in index* Missouri

shrew (mammal)
 MAIN ARTICLE *volume 12 page 84, picture, volume 12 page 84*

shrew mole (mammal)
 mole *volume 8 page 155*

Shriver, Eunice Kennedy (U.S. philanthropist)
 Special Olympics *volume 12 page 161*

shul (place of worship): *see in index* synagogue

shutter (camera device)
 camera *volume 3 page 20, picture, volume 3 page 20*

Shwedagon Pagoda (temple buildings in Yangon, Myanmar)
 Yangon *volume 15 page 86*

Si (chemical element): *see in index* silicon

Siam (country in Southeast Asia): *see in index* Thailand

siamang (primate)
gibbon *volume 5 page 114*

Sian (city in China): *see in index* Xi'an

Siberia (region in Asia)
Asia *volume 1 page 200*
Russia *volume 11 page 104*

Siberian elm (tree)
elm *volume 4 page 128*

Siberian husky (breed of dog)
working dogs *table, volume 4 page 62*

Siberian iris (plant) *picture, volume 6 page 157*

Siberian tiger (mammal) *picture, volume 13 page 65*
tiger *volume 13 page 65*

Sicily (island in Italy)
Mount Etna *volume 4 page 157*

sickle-cell anemia (blood disorder)
human disease *volume 4 page 57*

sickness: *see in index* disease

Siddhartha Gautama (founder of Buddhism): *see in index* Buddha

Siddiq, al- (Muslim caliph): *see in index* Abu Bakr

side-striped jackal (mammal)
jackal *volume 7 page 4*

sidestroke (swimming)
swimming *volume 12 page 215*

sidewalk surfing (sport and hobby): *see in index* skateboarding

sidewinding (zoology)
reptile *volume 11 page 52*
snake *volume 12 page 114*

Sidon (city in Lebanon) *picture, volume 7 page 120*

Sierra Leone (country in Africa)
MAIN ARTICLE *volume 12 page 85*

MORE TO EXPLORE
voting line *picture, volume 4 page 35*

Sierra Nevada (mountain range in the U.S.)

MAIN ARTICLE *volume 12 page 86, picture, volume 12 page 86*

MORE TO EXPLORE

California *volume 3 page 11*
Nevada *volume 9 page 40*

sight (physiology and senses)
primate *volume 10 page 148*
senses *volume 12 page 68, picture, volume 12 page 68*

sign (promotion)
advertising *volume 1 page 32*

sign, street: *see in index* street sign

signature (publishing)
book and bookmaking *volume 2 page 109*

sign language (form of communication)
MAIN ARTICLE *volume 12 page 87, picture, volume 12 page 87*

MORE TO EXPLORE
deafness *volume 4 page 21*
language *volume 7 page 105*
teacher using sign language *picture, volume 12 page 87*

Sikhism (religion)
MAIN ARTICLE *volume 12 page 87*

MORE TO EXPLORE
Indira Gandhi *volume 5 page 85*
major world religions *table, volume 11 page 43*
monk *volume 8 page 166*
Sikh leader reading the Adi Granth *picture, volume 12 page 88*
Sikh temple *picture, volume 6 page 124*

Silenus (Greek mythology)
Midas *volume 8 page 121*

silica (chemical compound)
glass *volume 5 page 118*

silicon (chemical element)
electronics *volume 4 page 123*

silk (fiber)
MAIN ARTICLE *volume 12 page 88*

MORE TO EXPLORE
clothing *volume 3 page 142*
fibers *volume 5 page 16*
images
silk cloth *picture, volume 12 page 89*
silkworm *picture, volume 12 page 89*
insects *volume 6 page 140*
spiders *volume 12 page 164*

Silk Road (trade route)
Polo *volume 10 page 119*

silk *volume 12 page 89*
Uzbekistan *volume 14 page 47*

silkworm (caterpillar)
butterfly and moth *volume 2 page 158*
silk *volume 12 page 88, picture, volume 12 page 89*

silky anteater (mammal): *see in index* two-toed anteater

Silla (ancient kingdom in Korea)
North Korea *volume 7 page 80*
South Korea *volume 7 page 83*

“Silmarillion, The” (work by Tolkien)
Tolkien *volume 13 page 77*

silt (mineral)
soil *volume 12 page 125*

silver (chemical element)
Carson City *volume 3 page 45*
money *volume 8 page 160*

silverback (gorilla) *picture, volume 5 page 129*

silver fox (mammal)
fox *volume 5 page 57*

Silver State (state in the U.S.): *see in index* Nevada

Silverstein, Shel (U.S. author, poet, and cartoonist)
MAIN ARTICLE *volume 12 page 90, picture, volume 12 page 90*

Simien Mountains National Park (national park in Ethiopia)
walia ibex on a mountainside *picture, volume 4 page 155*

simple eye (anatomy)
insect anatomy *picture, volume 6 page 138*

simple fracture (of bone) *picture, volume 2 page 106*

simple machine
machine *volume 8 page 6, picture, volume 8 page 6*

simulator (training device)
space exploration *volume 12 page 151*

Sinai, Mount (mountain in Egypt)
Moses *volume 8 page 187*

Sinai Peninsula (peninsula in Egypt)
Egypt *volume 4 page 109*

Singapore (island nation in Southeast Asia)

MAIN ARTICLE *volume 12 page 91*

MORE TO EXPLORE

city-state *volume 3 page 126*

Malaysia *volume 8 page 28*

skyscrapers *picture, volume 12 page 104*

symbol of Singapore *picture, volume 12 page 91*

Singapore (capital city of Singapore)
Singapore *volume 12 page 91*

Singapore River (river in Singapore) *picture, volume 12 page 104*

Singapura (capital city of Singapore): *see in index* Singapore

Singh, Gobind (Sikh Guru): *see in index* Gobind Singh

Singh, Manmohan (prime minister of India)
India *volume 6 page 125*

Sinhalese (people): *see in index* Sinhalese

singing (vocal music)
music *volume 8 page 212*

singles (tennis)
tennis *volume 13 page 45*

Sinhalese (people)
Sri Jayawardenepura Kotte *volume 12 page 173*
Sri Lanka *volume 12 page 174*

Sino-Tibetan languages
language *volume 7 page 105*

Sinterklaas (legendary person): *see in index* Santa Claus

Sioux (Native American people)
MAIN ARTICLE *volume 12 page 92*
MORE TO EXPLORE
Crazy Horse *volume 3 page 211*
Custer *volume 3 page 233*
Native Americans *volume 9 page 16*
Sioux holding a bow and arrows *picture, volume 12 page 92*
Sitting Bull *volume 12 page 93, picture, volume 12 page 93*
South Dakota *volume 12 page 149*
Black Hills *volume 2 page 87*
Wounded Knee *volume 15 page 72*

Sioux Uprising (U.S. history)
Minnesota *volume 8 page 136*

Siqueiros, David Alfaro (Mexican painter)
Rivera *volume 11 page 69*

SIS (British government): *see in index* Secret Intelligence Service

Sistine Chapel (chapel in Vatican City)
Michelangelo *volume 8 page 115*
Vatican City *volume 14 page 59*

sit-in (social protest)
civil rights movement *volume 3 page 130*

Sitka (town in Alaska, U.S.)
Tlingit gathering *picture, volume 13 page 72*

Sitting Bull (chief of Sioux nation)
MAIN ARTICLE *volume 12 page 92, picture, volume 12 page 93*

MORE TO EXPLORE
Sioux *volume 12 page 92*

Siva (Hindu god)
Hinduism *volume 6 page 56*
shrine *picture, volume 6 page 56*

Six-Day War (Middle East, 1967)
Arab-Israeli Wars *volume 1 page 158*

Six Nations Reserve (Native American Reserve in Canada)
Tuscarora *volume 13 page 118*

Sixth Crusade (European, Christian and Islamic history): *see in index* Crusades

Skanderbeg (Albanian hero)
citadel at Krujë *picture, volume 1 page 65*

skate (fish)
ray *volume 11 page 30*

skate (sports equipment)
types of skates *picture, volume 6 page 109*

skateboarding (sport and hobby)
MAIN ARTICLE *volume 12 page 93, picture, volume 12 page 93*
MORE TO EXPLORE
skating *volume 12 page 94*

skate park
skateboarding *volume 12 page 94*

skating (sport)
MAIN ARTICLE *volume 12 page 94, picture, volume 12 page 94*

skating, roller (sport): *see in index* roller skating

skeletal muscle (anatomy)
bone and body movement *picture, volume 8 page 208*
human skeletal muscles *picture, volume 8 page 207*
muscle *volume 8 page 208*

skeletal system (anatomy and physiology)
MAIN ARTICLE *volume 12 page 95*

MORE TO EXPLORE
four animal skeletal systems *picture, volume 12 page 95*
human skeletal system *picture, volume 12 page 96*
knee joint in cross section *picture, volume 12 page 97*

skeleton (anatomy)
coral *volume 3 page 197*

Skelton, Martha Wayles (wife of Thomas Jefferson)
Jefferson *volume 7 page 17*

skiing (sport)
MAIN ARTICLE *volume 12 page 97*
MORE TO EXPLORE
Alpine skiing courses *picture, volume 12 page 98*
freestyle skiing courses *picture, volume 12 page 99*
Olympic Games *volume 9 page 134*
skiers in Vermont *picture, volume 14 page 69*
slalom ski racing *picture, volume 12 page 98*
snowboarding half-pipe course *picture, volume 12 page 100*

ski jumping (sport)
skiing *volume 12 page 98*

skin (anatomy)
MAIN ARTICLE *volume 12 page 101*
MORE TO EXPLORE
acne *volume 1 page 18*
amphibians *volume 1 page 109*
armadillo *volume 1 page 183*
burn and scald *volume 2 page 152*
human skin *picture, volume 12 page 101*
cosmetics *volume 3 page 202*

skin, human (anatomy)
skin *volume 12 page 101*

skin graft (physiology)
transplant *volume 13 page 91*

skipjack tuna (fish)tuna *volume 13 page 106***Skłodowska, Maria** (French physicist):*see in index* Curie, Marie**Skopje** (capital city of Macedonia)MAIN ARTICLE *volume 12 page 102*

MORE TO EXPLORE

Macedonia *volume 8 page 5***skull** (anatomy)MAIN ARTICLE *volume 12 page 102, picture, volume 12 page 102*

MORE TO EXPLORE

skeletal system *volume 12 page 97***skunk** (mammal)MAIN ARTICLE *volume 12 page 103, picture, volume 12 page 103***skunk bear** (mammal): *see in index* wolverine**skyscraper** (building)MAIN ARTICLE *volume 12 page 104*

MORE TO EXPLORE

architecture *volume 1 page 171*cities *volume 3 page 125*Chicago *volume 3 page 92, picture, volume 3 page 93, picture, volume 6 page 117*Hong Kong *picture, volume 6 page 78*Kuala Lumpur *picture, volume 7**page 88*Kuwait *picture, volume 7 page 92*New York City *picture, volume 9**page 59*Singapore *picture, volume 12 page 104*Tokyo *picture, volume 3 page 124*world's tallest buildings *picture, volume 12 page 104*steel *volume 12 page 184***slalom** (ski race) *picture, volume 12**page 98*Alpine skiing courses *picture, volume 12**page 98*skiing *volume 12 page 99***slate** (rock) *picture, volume 11 page 76***Slav** (people)Balkan Peninsula *volume 2 page 12*Yugoslavia *volume 15 page 95*Slovakia *volume 12 page 109***slave** (sociology)slavery *volume 12 page 105***slave rebellions**Turner *volume 13 page 116***slavery** (human practice)MAIN ARTICLE *volume 12 page 105*

MORE TO EXPLORE

abolitionist movement *volume 1 page 11*Africa *volume 1 page 42*Angola *volume 1 page 123*Ashanti *volume 1 page 197*Gabon *volume 5 page 78*Gambia *volume 5 page 84*Ghana *volume 5 page 111*Réunion *volume 11 page 57*civil rights *volume 3 page 128*empire *volume 4 page 131*human migration *volume 8 page 126*human rights *volume 6 page 97*

images

former slave houses *picture, volume 12 page 107*slave ship layout *picture, volume 12 page 106*slave ship memorial *picture, volume 12 page 105*labor *volume 7 page 96*North America *volume 9 page 81*South America *volume 12 page 144*Brazil *volume 2 page 127, volume 12 page 35*French Guiana *volume 5 page 68*Guyana *volume 5 page 173*

United States

African Americans *volume 1 page 43*Alabama *volume 1 page 61*American Civil War *volume 1 page 94*Brown *volume 2 page 136*Buchanan *volume 2 page 138*Columbus *volume 3 page 161*Confederacy *volume 3 page 176*Davis *volume 4 page 18*Douglass *volume 4 page 67*Dred Scott Decision *volume 4 page 76*Emancipation Proclamation *volume 4 page 130*Fillmore *volume 5 page 20*Fugitive Slave Acts *volume 5 page 73*Jefferson *volume 7 page 17*Kansas *volume 7 page 48*Topeka *volume 13 page 81*Kansas-Nebraska Act *volume 7**page 49*Lincoln *volume 7 page 155*Lincoln-Douglas debates *volume 7 page 157*Louisiana *volume 7 page 181*Mexican War *volume 8 page 109*Michigan *volume 8 page 117*Mississippi *volume 8 page 142*Missouri *volume 8 page 147*Missouri Compromise *volume 8 page 148*Monroe *volume 8 page 171*Mott *volume 8 page 193*Pierce *volume 10 page 80*Seminole *volume 12 page 64*South Carolina *volume 12 page 148*Stowe *volume 12 page 194*Taylor *volume 13 page 23*Truth *volume 13 page 102*Tubman *volume 13 page 105*Underground Railroad *volume 14 page 9*Virginia *volume 14 page 96*

West Indies

Grenada *volume 5 page 160*

Haiti

Toussaint Louverture *volume 13 page 83*Saint Vincent and the Grenadines *volume 12 page 18***slave trade**Ashanti *volume 1 page 197*Benin *volume 2 page 60*Porto-Novo *volume 10 page 132*colonization of the Americas *volume 1 page 104*Dahomey *volume 4 page 5*Dakar *volume 4 page 7*Luanda *volume 7 page 183*Nigeria *volume 9 page 69*Praia *volume 10 page 143*São Tomé *volume 12 page 35*slavery *volume 12 page 106, picture, volume 12 page 106***Slavic alphabet:** *see in index* Cyrillic alphabet**Slavic languages**Europe *volume 4 page 162*language *volume 7 page 105***sled**polar exploration *picture, volume 10 page 111***sled dog**dog breeds *table, volume 4 page 62*Iditarod *volume 6 page 113, picture, volume 6 page 113***sleep**MAIN ARTICLE *volume 12 page 107*

MORE TO EXPLORE

hibernation *volume 6 page 50*

sleight of hand (entertainment)

magic *volume 8 page 17*

Sleipnir (Norse mythology)

Odin *volume 9 page 124*

slime mold (organism) *picture, volume 10 page 158*

protist *volume 10 page 159*

slip casting (ceramics)

pottery *volume 10 page 139*

slippery elm (tree)

elm *volume 4 page 128*

sloth (mammal)

MAIN ARTICLE *volume 12 page 108, picture, volume 12 page 108*

sloth bear (mammal)

bear *volume 2 page 41*

Slovak (people)

Czechoslovakia *volume 3 page 238*

Slovakia (country in Europe)

MAIN ARTICLE *volume 12 page 109, picture, volume 12 page 109*

MORE TO EXPLORE

Bratislava *picture, volume 2 page 124*

Czechoslovakia *volume 3 page 238*

Slovakia (historical region in Europe)

Czechoslovakia *volume 3 page 238*

Slovene (people)

Slovenia *volume 12 page 110*

Slovenia (country in Europe)

MAIN ARTICLE *volume 12 page 110*

MORE TO EXPLORE

geography

Kranjska Gora and Julian Alps *picture, volume 12 page 110*

Lake Bled *picture, volume 2 page 13*

Ljubljana *picture, volume 7 page 171*

history

Serbia *volume 12 page 72*

Yugoslavia *volume 15 page 95*

slow loris (primate)

primate *picture, volume 10 page 149*

slug (mollusk)

MAIN ARTICLE *volume 12 page 111*

MORE TO EXPLORE

mollusk *volume 8 page 156*

sluice (passage through a dam)

dam *volume 4 page 10*

small intestine (anatomy)

cholera *volume 3 page 110*

digestive system *volume 4 page 48*

frog *picture, volume 4 page 48*

human *picture, volume 4 page 47, picture, volume 6 page 143*

proximity to liver *picture, volume 7 page 167*

intestines *volume 6 page 142*

pancreas *volume 10 page 24, picture, volume 10 page 24*

Small Magellanic Cloud (galaxy) *picture, volume 14 page 37***smallmouth black bass** (fish)

bass *volume 2 page 37*

smallpox (disease)

MAIN ARTICLE *volume 12 page 111*

MORE TO EXPLORE

Native Americans *volume 9 page 19*

vaccine *volume 14 page 49, picture, volume 12 page 111*

Small Temple (archaeological site in Egypt): *see in index* Abu Simbel**smart bomb** (military technology)

bomb *volume 2 page 104*

Smeaton, John (English engineer)

lighthouse *volume 7 page 150*

smell (sense)

nose *volume 9 page 99*

senses *volume 12 page 68, picture, volume 12 page 68*

smelting (metallurgy)

iron *volume 6 page 158*

metal *volume 8 page 106*

Smith, Abigail (first lady of the U.S.): *see in index* Adams, Abigail**Smith, Eleanor Rosalynn** (first lady of the U.S.): *see in index* Carter, Rosalynn Smith**Smith, John** (British explorer)

Pocahontas *volume 10 page 103*

Smith, Joseph (U.S. religious leader)

Mormons *volume 8 page 181*

Smith, Tommie (U.S. athlete)

1968 Olympic Games silent protest *picture, volume 1 page 44*

Smithfield (state capital of Washington, U.S.): *see in index* Olympia**Smithsonian Institution** (cultural institution in Washington, D.C., U.S.)

Adams *volume 1 page 25*

Washington, D.C. *volume 15 page 18*

smog (atmosphere)

pollution *volume 10 page 117*

smoking (tobacco)

human disease *volume 4 page 57*

Smoky Mountains (mountain range, North Carolina and Tennessee, U.S.): *see in index* Great Smoky Mountains**smooth muscle** (anatomy)

muscle *volume 8 page 209*

smothering (firefighting)

firefighting *volume 5 page 26*

smut (plant disease)

parasite *volume 10 page 33*

Sn (chemical element): *see in index* tin**snail** (mollusk)

MAIN ARTICLE *volume 12 page 111, picture, volume 12 page 112*

MORE TO EXPLORE

mollusk *volume 8 page 156*

muscular foot *picture, volume 8*

page 207

shell *volume 12 page 80*

Snake (Native American people): *see in index* Shoshone**snake** (reptile)

MAIN ARTICLE *volume 12 page 112*

MORE TO EXPLORE

ear *volume 4 page 88*

nose *volume 9 page 100*

reptile *volume 11 page 51*

scales *picture, volume 11 page 51*

sensory reception *picture, volume 12 page 68*

types of snakes

green mamba *picture, volume 12 page 115*

mangrove snake *picture, volume 12 page 114*

various snakes *picture, volume 12 page 113*

snake eagle (bird): *see in index* serpent eagle

Snake River (river in the U.S.)
Wyoming *picture, volume 15 page 79*

snapping turtle (reptile)
turtle *volume 13 page 117*

snare drum (musical instrument)
percussion instruments *picture, volume 8 page 215*

sneeze (reflex action) *picture, volume 1 page 84*

Snoopy (cartoon character)
Schulz *volume 12 page 48*

snout (anatomy)
pig *picture, volume 9 page 99*

snow (weather)
MAIN ARTICLE *volume 12 page 115, picture, volume 12 page 116*

MORE TO EXPLORE

avalanche *volume 1 page 238*
blizzard *picture, volume 12 page 192*
glacier *volume 5 page 117*
mountain region *picture, volume 12 page 115*
water cycle *picture, volume 15 page 23*
wind *picture, volume 15 page 48*

snow and ice climate: *see in index* polar climate

snowboarding (winter sport)
half-pipe course *picture, volume 12 page 100*
skiing *volume 12 page 99*

snowflake (precipitation)
crystal *volume 3 page 226*
snow *volume 12 page 115*

snowstorm (weather)
storm *volume 12 page 193*

“Snow White and the Seven Dwarfs”
(animated film by Disney)
animation *volume 1 page 131*

soccer (sport)
MAIN ARTICLE *volume 12 page 116*
MORE TO EXPLORE
images
2006 World Cup *picture, volume 12 page 118*
Beckham *picture, volume 2 page 45*
children at play *picture, volume 12 page 167*
field *picture, volume 12 page 117*
Hamm *picture, volume 12 page 118*

Pelé *volume 10 page 50, picture, volume 10 page 50*
rugby *volume 11 page 103*

social anthropology (science): *see in index* cultural anthropology

social class (sociology): *see in index* caste

social contract (political and government philosophy)
constitution *volume 3 page 189*

social dance
dance *volume 4 page 14*

social equality: *see in index* equal rights

social insect
insect *volume 6 page 139*

socialism (political and economic system)
MAIN ARTICLE *volume 12 page 119*

MORE TO EXPLORE

campaign poster *picture, volume 12 page 119*
capitalism *volume 3 page 34*
communism *volume 3 page 167*
economics *volume 4 page 101*
International Working Men's Association *picture, volume 12 page 120*
labor *volume 7 page 97*

social sciences
MAIN ARTICLE *volume 12 page 120*

MORE TO EXPLORE

family in a park *picture, volume 12 page 121*
science *volume 12 page 49*

Social Security (U.S. government program)
New Deal *volume 9 page 44*

Social Security Act (U.S. legislation, 1935)
Roosevelt *volume 11 page 93*

social welfare program
banking *picture, volume 2 page 25*

Society of Friends (religious group): *see in index* Quakers

sociology (science)
MAIN ARTICLE *volume 12 page 121, picture, volume 12 page 121*

sodium chloride (chemical compound):
see in index salt

sodium fluoride (chemical compound)
dentistry *volume 4 page 38*

Sofia (capital city of Bulgaria)
MAIN ARTICLE *volume 12 page 122*

MORE TO EXPLORE

Alexander Nevski Memorial Church
picture, volume 12 page 122
Bulgaria *volume 2 page 148*

softball (sport)
MAIN ARTICLE *volume 12 page 122, picture, volume 12 page 123, picture, volume 12 page 124*

softball (ball)
softball *volume 12 page 123*

soft magnet (physics)
magnet *volume 8 page 19*

soft palate (anatomy)
anatomy of mouth *picture, volume 8 page 197*

soft tick (arachnid)
tick and mite *volume 13 page 63*

software (computing)
computer *volume 3 page 172*
electronic games *volume 4 page 121*

softwood (type of tree)
forest *volume 5 page 53*

soil
MAIN ARTICLE *volume 12 page 124*

MORE TO EXPLORE

cross section of soil and glacial till *picture, volume 12 page 124*
erosion *volume 4 page 153*

Sojourner (U.S. Martian rover) *picture, volume 8 page 59*

solar cell (electricity)
solar energy *volume 12 page 125*

solar corona (sun): *see in index* corona

solar eclipse (astronomy)
comparison to lunar eclipse *picture, volume 4 page 98*
eclipse *volume 4 page 98*
total solar eclipse *picture, volume 4 page 98*

solar energy
MAIN ARTICLE *volume 12 page 125*
MORE TO EXPLORE
energy *volume 4 page 138*
flat-plate collectors *picture, volume 12 page 125*

solar flare (astronomy)

sun *volume 12 page 203*, *picture, volume 12 page 203*, *picture, volume 12 page 203*

solar furnace (technology)

solar energy *volume 12 page 125*

solar heating (technology)

solar energy *volume 12 page 125*

solar system (astronomy)

MAIN ARTICLE *volume 12 page 126*, *picture, volume 12 page 127*

MORE TO EXPLORE

gravity *volume 5 page 144*

planets *volume 10 page 92*

satellite *volume 12 page 41*

sun *volume 12 page 202*

solar flare *picture, volume 12 page 203*

sunspot *picture, volume 12 page 203*

solar wind (astronomy)

aurora *volume 1 page 228*

solar system *volume 12 page 127*

sun *volume 12 page 203*

soldier (military)

army *volume 1 page 189*

soldier (insect caste)

ants *volume 1 page 133*

termites *volume 13 page 48*

solid (state of matter)

matter *volume 8 page 78*, *picture, volume 8 page 78*

Solidarity (Polish organization)

demonstration *picture, volume 7 page 98*

labor *volume 7 page 98*

Poland *volume 10 page 109*

solidification (phase change): *see in index* freezing**solid state** (state of matter): *see in index* solid**solid waste** (biology): *see in index* feces**soliloquy** (dramatic device)

drama *volume 4 page 72*

Solomon (king of Israel)

Judaism *volume 7 page 38*

Solomon Islands (island country in the Pacific Ocean)

MAIN ARTICLE *volume 12 page 129*

MORE TO EXPLORE

coral reefs *picture, volume 12 page 129*

dancers in traditional clothing *picture, volume 6 page 79*

Solomon's Temple (Judaism): *see in index* Jerusalem, Temple of**solution cave** (geology)

cave *volume 3 page 62*

Solzhenitsyn, Aleksandr (Russian author)

Soviet Union *volume 14 page 12*

Somali (people)

Somalia *volume 12 page 130*

Somalia (country in Africa)

MAIN ARTICLE *volume 12 page 130*

MORE TO EXPLORE

nomads *picture, volume 9 page 76*

schoolchildren *picture, volume 8*

page 151, *picture, volume 12 page 130*

Somaliland (historical region in Africa)

Somalia *volume 12 page 131*

somma volcano (geology)

volcano *volume 14 page 101*, *picture, volume 14 page 101*

Somme, Battle of the (1916, France)

World War I *volume 15 page 62*

sonar (technology)

submarine *volume 12 page 197*

song (vocal music)

folk music *volume 5 page 41*

songbird (bird)

MAIN ARTICLE *volume 12 page 132*, *picture, volume 12 page 132*

MORE TO EXPLORE

communication *picture, volume 3 page 167*

song box (body part): *see in index* syrinx**Songhai empire** (historical empire in Africa)

MAIN ARTICLE *volume 12 page 132*

MORE TO EXPLORE

Mali *volume 8 page 32*

Niger *volume 9 page 67*

song sparrow (bird)

sparrow *volume 12 page 159*

Soninke (people)

Ghana Empire *volume 5 page 112*

sonnet (poetic form)

poetry *volume 10 page 106*

Sonni 'Ali (West African ruler)

Songhai empire *volume 12 page 133*

Sonoma (city in California, U.S.)

California missions *table, volume 8 page 140*

Sony Corporation (Japanese company)

baseball-throwing robot *picture, volume 11 page 74*

Soo Canals (canals in North America):

see in index Sault Sainte Marie canals

Soo Locks (locks in Michigan, U.S.)

Sault Sainte Marie canals *volume 12 page 47*

Sooner State (state in the U.S.): *see in index* Oklahoma**sorcery**: *see in index* witchcraft**Sorenstam, Annika** (Swedish golfer)

golf *volume 5 page 126*

sorghum (grain)

MAIN ARTICLE *volume 12 page 133*, *picture, volume 12 page 133*

sorghum (syrup)

sorghum *volume 12 page 134*

Sotho (people)

Lesotho *volume 7 page 134*

Maseru *volume 8 page 70*

traditional houses *picture, volume 7 page 134*

Soto, Hernando de (Spanish explorer): *see in index* de Soto, Hernando**Sotomayor, Sonia** (U.S. jurist)

Hispanic Americans *volume 6 page 63*

Soufrière (Saint Lucia) *picture, volume 12 page 14***Soufrière, Mount** (volcano in Saint Vincent and the Grenadines)

Saint Vincent and the Grenadines *volume 12 page 18*

soul music

Charles *volume 3 page 82*

sound (physics)

MAIN ARTICLE *volume 12 page 134*, *picture, volume 12 page 134*, *picture, volume 12 page 135*

MORE TO EXPLORE

language *volume 7 page 105*

poetry *volume 10 page 105*

radiation *volume 11 page 17*

sound recording *volume 12 page 135*

sound recording

MAIN ARTICLE *volume 12 page 135*

MORE TO EXPLORE

Edison phonograph *picture, volume 12 page 135*

MP3 player *picture, volume 12 page 136*

sound track (recording)

movie *volume 8 page 198*

sound wave (physics): *see in index* sound

sour-cherry (tree and fruit)

cherry *volume 3 page 89*

sour orange (fruit)

orange *volume 9 page 144*

South, the (region in the U.S.)

American Civil War *volume 1 page 94*

Charleston historic homes *picture, volume 12 page 148*

civil rights movement *volume 3 page 129*

Evers *volume 4 page 168*

home and church in Biloxi *picture, volume 8 page 142*

Louisiana plantation *picture, volume 7 page 181*

plantation slave homes *picture, volume 12 page 107*

Stowe *volume 12 page 195*

Turner *volume 13 page 116*

South Africa (country in Africa)

MAIN ARTICLE *volume 12 page 137*

MORE TO EXPLORE

African National Congress *volume 1 page 45*

geography

gold mining *picture, volume 8 page 133*

Kalahari: *see in index* Kalahari

history

civil rights

apartheid *volume 1 page 144*

discrimination *volume 4 page 54*

Gandhi *volume 5 page 86*

gold rush *volume 5 page 124*

Lesotho *volume 7 page 134*

Namibia *volume 9 page 7*

Windhoek *volume 15 page 49*

timeline *volume 12 page 137*

Tutu *volume 13 page 120*

people and culture

Roman Catholic worshippers *picture, volume 11 page 83*

school girls *picture, volume 12 page 137*

Zulu prince *picture, volume 12 page 138*

voting *volume 14 page 105, picture, volume 3 page 128*

South African Council of Churches

(South African religious organization)

Tutu *volume 13 page 120*

South African Republic (historical independent state in southern Africa)

South Africa *volume 12 page 138*

South African War (British-South African history, 1899-1902): *see in index* Boer War

South America (continent)

MAIN ARTICLE *volume 12 page 140*

MORE TO EXPLORE

geography

Amazon River *volume 1 page 91*

Andes mountains *volume 1 page 117, picture, volume 1 page 118, picture, volume 10 page 65*

Angel Falls *picture, volume 14 page 63*

Iguazú Falls *picture, volume 12 page 142*

Latin America *volume 7 page 112*

Ushuaia, Argentina *picture, volume 12 page 140*

history

abolitionist movement *volume 1 page 11*

Bolívar *volume 2 page 101*

exploration and settlement of the Americas *volume 1 page 102*

people and culture

Native Americans: *see in index* South American Indian

Peruvian farmer *picture, volume 12 page 143*

For more about South America, look for articles on these countries:

Argentina

Bolivia

Brazil

Chile

Colombia

Ecuador

Guyana

Paraguay

Peru

Suriname

Uruguay

Venezuela

South American Indian (Native American peoples)

Amazon River *volume 1 page 92*

arts: *see in index* Native American arts

Brazil *volume 2 page 126*

Peru *volume 10 page 64*

potato *volume 10 page 137*

South Asia (region in Asia)

Asia *volume 1 page 200*

South Atlantic Ocean (region of the Atlantic Ocean)

Atlantic Ocean *volume 1 page 220*

South Australia (state in Australia)

MAIN ARTICLE *volume 12 page 145, picture, volume 12 page 145*

South Beach (area in Miami, Florida, U.S.)

sidewalk café area *picture, volume 5 page 35*

South Carolina (state in the U.S.)

MAIN ARTICLE *volume 12 page 147*

MORE TO EXPLORE

geography

historic building in Columbia *picture, volume 3 page 160*

historic homes in Charleston *picture, volume 12 page 148*

Myrtle Beach *picture, volume 12 page 148*

South Dakota (state in the U.S.)

MAIN ARTICLE *volume 12 page 149*

MORE TO EXPLORE

geography

bison in state park *picture, volume 2 page 82*

Mount Rushmore *picture, volume 12 page 150*

State Capitol *picture, volume 10 page 82*

Southeast American Indian (Native American people): *see in index* Southeast Indian

Southeast Asia (region of Asia)

Asia *volume 1 page 200*

Southeast Indian (Native American people): *see in index* Caddo; Cherokee; Chickasaw; Choctaw; Creek; Natchez; Seminole

Southern Alps (mountains in New Zealand)

New Zealand *volume 9 page 61*

southern anaconda (reptile): *see in index* yellow anaconda

Southern Christian Leadership Conference (U.S. organization)Abernathy *volume 1 page 9*civil rights movement *volume 3 page 130*Jackson *volume 7 page 7*King *volume 7 page 66***Southern Europe** (region in Europe)Europe *volume 4 page 160***Southern Hemisphere** (geography)Earth *volume 4 page 90*equatorial division of Earth *picture, volume 4 page 147*hemisphere *volume 6 page 37*season *volume 12 page 61***southern lights** (atmospheric phenomenon): *see in index* aurora australis**southern magnolia** (plant)magnolia *volume 8 page 20***Southern Paiute** (Native American people)Paiute *volume 10 page 12***Southern Ponca** (Native American people)Ponca *volume 10 page 122***Southern Rhodesia** (historical British colony in Africa): *see in index* Zimbabwe**Southern States** (region in the U.S.): *see in index* South, the**Southern Uplands** (region in Scotland, United Kingdom)Scotland *volume 12 page 52***South Island** (island in New Zealand)New Zealand *volume 9 page 61***South Korea:** *see in index* Korea, South**South Pacific, University of the** (university in Suva, Fiji)Suva *volume 12 page 209***South Pole**Amundsen *volume 1 page 113*Antarctica *volume 1 page 135*polar exploration *volume 10 page 111*season *volume 12 page 62*weather station *picture, volume 3 page 137***South Vietnam:** *see in index* Vietnam**South West Africa:** *see in index* Namibia**South West Africa People's Organization** (political organization in Namibia)Namibia *volume 9 page 7***Southwest Asia** (region of Asia)Asia *volume 1 page 200***Southwest Indian** (Native American people)Utah *volume 14 page 45***South Yemen** (historical country in the Middle East): *see in index* People's Democratic Republic of Yemen**Soviet Union** (historic country in Eurasia): *see in index* Union of Soviet Socialist Republics**sow** (mammal)pig *volume 10 page 83***Soweto Rebellion** (South African history, 1976)apartheid *volume 1 page 145***soybean** (plant)bean *volume 2 page 41*legume *volume 7 page 125***soy sauce** (food)fermentation *volume 5 page 11, picture, volume 5 page 11***space** (astronomy)rocket *volume 11 page 77***spacecraft**Magellan *picture, volume 14 page 66*Mars *volume 8 page 59*Pluto *volume 10 page 102*rocket *volume 11 page 76*Saturn *volume 12 page 42*

Voyager 2

Neptune *picture, volume 9 page 33*Uranus *picture, volume 14 page 39***space exploration**MAIN ARTICLE *volume 12 page 151*

MORE TO EXPLORE

"Discovery" *picture, volume 12 page 151*exploration *volume 4 page 174*robots *picture, volume 12 page 152*

space programs

Apollo program *picture, volume 4 page 175*Magellan *picture, volume 14 page 66*Voyager 2 *picture, volume 14 page 39***space laboratory:** *see in index* space station**space navigation**navigation *volume 9 page 25***space probe** (unmanned exploratory spacecraft)exploration *volume 4 page 175*space exploration *volume 12 page 152***space program:** *see in index* space exploration; spacecraft**space race** (world history)space exploration *volume 12 page 151***space shuttle**"Discovery" *picture, volume 12 page 151*Ride *volume 11 page 65*rocket *volume 11 page 77*space exploration *volume 12 page 152***space station** (artificial satellite)satellite *volume 12 page 41*space exploration *volume 12 page 152***space suit**vacuum *volume 14 page 50***Spain** (country in Europe)MAIN ARTICLE *volume 12 page 153*

MORE TO EXPLORE

geography

Alhambra fortress and palace *picture, volume 12 page 156*Barcelona *picture, volume 12 page 154*Madrid *picture, volume 8 page 13*Pyrenees *volume 10 page 172, picture, volume 10 page 171, picture, volume 12 page 153*

history

Americas *volume 1 page 102*Arawak *volume 1 page 162*Argentina *volume 2 page 146*Aztec *picture, volume 1 page 240*Bolívar *volume 2 page 101*Bolivia *volume 2 page 103, volume 7 page 108, volume 12 page 198*Carib *volume 3 page 40*Central America *volume 3 page 75*Chile *volume 3 page 99, volume 12 page 34*Colombia *volume 2 page 100*conquistador *volume 3 page 186*Costa Rica *volume 3 page 203, volume 12 page 28*Creek *volume 3 page 213*Cuba *volume 6 page 25*Dominican Republic *volume 4 page 66*Ecuador *volume 4 page 103*

- El Salvador *volume 4 page 129, volume 12 page 30*
 Equatorial Guinea *volume 4 page 148*
 Guatemala *volume 5 page 167, volume 5 page 168*
 Haiti *volume 6 page 9*
 Honduras *volume 6 page 77, volume 13 page 32*
 Inca *volume 6 page 121*
 Jamaica *volume 7 page 10*
 Latin America *volume 7 page 112*
 Magellan *volume 8 page 16*
 Maya *volume 8 page 82*
 Mexico *volume 8 page 111, volume 8 page 114*
 Miwok *volume 8 page 150*
 Nicaragua *volume 8 page 38, volume 9 page 64*
 North America *volume 9 page 83*
 Panama *volume 10 page 22, volume 10 page 24*
 Paraguay *volume 1 page 216, volume 10 page 31*
 Peru *volume 7 page 152, volume 10 page 65*
 Pima *volume 10 page 86*
 Pomo *volume 10 page 120*
 Puerto Rico *volume 10 page 165, volume 12 page 28*
 Spanish mission *volume 8 page 139, table, volume 8 page 140*
 Tohono O'odham *volume 13 page 75*
 Uruguay *volume 14 page 43*
 Venezuela *volume 14 page 64*
 Yaqui *volume 15 page 88*
 Zuni *volume 15 page 110*
- Asia and the Pacific region
 Federated States of Micronesia *volume 8 page 119*
 Guam *volume 5 page 165*
 Palau *volume 10 page 16*
 Philippines *volume 8 page 43, volume 10 page 72*
- Europe
 Basques *volume 2 page 36*
 Gibraltar *volume 5 page 114*
 Hapsburgs *volume 6 page 16*
 Inquisition *volume 6 page 137*
 Moor *volume 8 page 180*
 Spanish Armada *volume 1 page 183*
 timeline *volume 12 page 153*
 United States *volume 14 page 27*
 Baton Rouge *volume 2 page 39*
 California *volume 3 page 13*
- Hopi people *volume 6 page 83*
 Los Angeles *volume 7 page 178*
 Saint Augustine *volume 12 page 10*
 Spanish-American War *volume 12 page 157*
 Texas *volume 13 page 51*
- people and culture
 flamenco dancer *picture, volume 12 page 154*
 traditional costume *picture, volume 4 page 162*
- Spalato** (city in Croatia): *see in index* Split
- spandex** (artificial fiber)
 fibers *volume 5 page 17*
- Spanish-American War** (Spanish-U.S. history)
 MAIN ARTICLE *volume 12 page 157*
 MORE TO EXPLORE
 Guam *volume 5 page 165*
 McKinley *volume 8 page 87*
 Philippines *volume 10 page 72*
 Puerto Rico *volume 10 page 165*
 Roosevelt *volume 11 page 94*
 soldiers *picture, volume 12 page 157*
 United States *volume 14 page 30*
- Spanish Armada** (Spanish naval fleet): *see in index* Armada, Spanish
- Spanish Civil War** (Spanish history)
 MAIN ARTICLE *volume 12 page 158, picture, volume 12 page 158*
- Spanish Guinea** (former Spanish colony in Africa): *see in index* Equatorial Guinea
- Spanish language**
 Central America *volume 3 page 75*
 North America *volume 9 page 81*
 Spain *volume 12 page 154*
- Spanish mission** (Spanish history): *see in index* mission, Spanish
- Spanish moss** (plant)
 oak trees in Georgia *picture, volume 5 page 102*
- Spanish Succession, War of the** (European history)
 Spain *volume 12 page 155*
- spark plug** (electrical device)
 automobile *volume 1 page 236*
 internal-combustion engine *volume 6 page 141*
- sparrow** (bird)
 MAIN ARTICLE *volume 12 page 159*
 MORE TO EXPLORE
 Eurasian tree sparrow *picture, volume 12 page 160*
 finch *volume 5 page 21*
- Sparta** (ancient city-state of Greece)
 MAIN ARTICLE *volume 12 page 160, picture, volume 12 page 160*
 MORE TO EXPLORE
 ancient Greece *volume 5 page 154, volume 5 page 156*
 city-state *volume 3 page 126*
- speaker** (House of Commons)
 Parliament *volume 10 page 37*
- speaker of the House** (U.S. government)
 United States government *volume 14 page 33*
- spear** (weapon)
 war *picture, volume 15 page 9*
- special effect** (technology)
 movie *volume 8 page 198*
 "Return of the Jedi" *picture, volume 8 page 198*
 "Titanic" *picture, volume 8 page 199*
- special hospital** (medical facility)
 hospital *volume 6 page 88*
- Special Olympics** (international athletic organization)
 MAIN ARTICLE *volume 12 page 161, picture, volume 12 page 161*
- species diversity** (environmental science): *see in index* biodiversity
- speckled trout** (fish)
 trout *volume 13 page 99*
- spectacled bear** (mammal)
 bear *volume 2 page 41*
- spectacles** (optical aid): *see in index* eyeglasses
- spectral tarsier** (primate): *see in index* Sulawesi tarsier
- spectrum** (physics)
 light *volume 7 page 148*
 prism *volume 10 page 153*
- speech** (ability to talk)
 MAIN ARTICLE *volume 12 page 161, picture, volume 12 page 162*
 MORE TO EXPLORE
 child development *volume 3 page 97*

communication *volume 3 page 167*
 language *volume 7 page 104*
 tongue *volume 13 page 80*
 writing *volume 15 page 76*

speech disorder (medical condition)
 speech *volume 12 page 162*

speed (mechanics)
 motion *volume 8 page 192*
 sound *volume 12 page 134, picture, volume 12 page 134*

speedboat (water vessel)
 pirate *volume 10 page 90*

speed skate (sports equipment)
 ice skating *volume 6 page 109*
 speed skating *picture, volume 6 page 110*
 types of skates *picture, volume 6 page 109*

speed skating (sport) *picture, volume 6 page 110*
 ice skating *volume 6 page 110*
 types of skates *picture, volume 6 page 109*

spelunker (cave explorer): *see in index* cave exploration

spelunking: *see in index* cave exploration

sperm (reproductive cell)
 chromosome *volume 3 page 116*
 egg *volume 4 page 108*
 gender determination *picture, volume 5 page 93*
 genetics *volume 5 page 93*
 pollen *volume 10 page 116*
 reproductive system *volume 11 page 48*

spermatozoa (reproductive cell): *see in index* sperm

sperm whale (mammal)
 whale species *picture, volume 15 page 37*

sphagnum moss (plant): *see in index* peat moss

sphere (mathematics)
 geometry *volume 5 page 99*

sphinx (mythology)
 MAIN ARTICLE *volume 12 page 163, picture, volume 12 page 163*

MORE TO EXPLORE
 Alexandria, Egypt *picture, volume 1 page 75*

Sphinx of Thebes (Greek mythology)
 sphinx *volume 12 page 163*

spice (food)
 MAIN ARTICLE *volume 12 page 163, picture, volume 12 page 164*

MORE TO EXPLORE
 East Indies *picture, volume 4 page 95*
 pepper *volume 10 page 59*

Spice, Isle of (island country in the West Indies): *see in index* Grenada

Spice Islands (islands in the Indian and Pacific Oceans): *see in index* East Indies; Moluccas

spider (arachnid)
 MAIN ARTICLE *volume 12 page 164, picture, volume 12 page 164*

MORE TO EXPLORE
 heart *volume 6 page 32*
 silk *volume 12 page 89*

spider crab (crustacean)
 crustacean *volume 3 page 225*

Spike (cartoon character)
 Schulz *volume 12 page 48*

spike (plant part)
 wheat *volume 15 page 39*

spillway (construction)
 dam *volume 4 page 10*

spin (ice skating)
 figure skating *picture, volume 6 page 110*

spin (physics): *see in index* rotation

spinach (plant and food)
 MAIN ARTICLE *volume 12 page 165, picture, volume 12 page 165*

spinal cord (anatomy) *picture, volume 9 page 36*
 nervous system *volume 9 page 34, picture, volume 9 page 35*

Spindletop (oilfield in Texas, U.S.)
 Texas *volume 13 page 52*

spine (anatomy)
 meningitis *volume 8 page 99*
 skeletal system *volume 12 page 96*

spinneret (animal anatomy)
 spider *volume 12 page 164*

spinning jenny (textiles)
 Industrial Revolution *volume 6 page 133*

spiny anteater (mammal): *see in index* echidna

spiny hedgehog (mammal)
 hedgehog *volume 6 page 33*

spiracle (anatomy)
 exoskeleton *volume 4 page 173*
 grasshopper respiratory system *picture, volume 11 page 54*

spiral galaxy (astronomy)
 galaxy *volume 5 page 81*
 Whirlpool Galaxy *picture, volume 5 page 81*

spire (architecture)
 twin-spired cathedral *picture, volume 15 page 100*

Spirit (Christianity): *see in index* Holy Spirit

Spirit (Mars rover)
 Mars *volume 8 page 60*

“Spirit of Saint Louis” (aircraft) *picture, volume 7 page 157*
 Lindbergh *volume 7 page 157*

spiritual (music)
 gospel music *volume 5 page 130*

spitting cobra (snake)
 cobra *volume 3 page 145*

spleen (anatomy)
 cardiovascular system *volume 3 page 39*
 lymphatic system *picture, volume 7 page 189*
 malaria *volume 8 page 25*

Split (city in Croatia)
 outdoor café *picture, volume 3 page 219*

“Split Sides” (dance by Cunningham)
 picture, *volume 4 page 11*

spoils system (politics)
 Hayes *volume 6 page 30*

Spokane (Native American people)
 MAIN ARTICLE *volume 12 page 166, picture, volume 12 page 166*

Spokane War (U.S. history, 1858)
 Spokane *volume 12 page 166*

spoken language: *see in index* speech

sponge (animal)
 MAIN ARTICLE *volume 12 page 166, picture, volume 12 page 167*

sponge gourd (gourd): *see in index* loofah

spongy bone (anatomy)
 arm *picture, volume 2 page 106*

bone *volume 2 page 106*

spoonbill (bird)

ibis *volume 6 page 106*

spore (seedlike reproductive body)

ferns *volume 5 page 12*

fungus *volume 5 page 75*

moss *volume 8 page 190*

plant *volume 10 page 95*

protist *volume 10 page 159*

sport fishing (recreation): *see in index*
fishing

sporting breed (dog group)

dog *volume 4 page 63, table, volume 4*
page 62

sports

MAIN ARTICLE *volume 12 page 167*

MORE TO EXPLORE

children playing soccer *picture, volume 12 page 167*

Native American ball game *picture, volume 3 page 109*

To learn about some famous athletes, look for these articles:

Aaron, Hank	Paige, Satchel
Ali, Muhammad	Payton, Walter
Armstrong, Lance	Pelé
Ashe, Arthur	Robinson, Jackie
Beckham, David	Rudolph, Wilma
Bell, Cool Papa	Ruth, Babe
Gretzky, Wayne	Thorpe, Jim
Johnson, Jack	Williams, Venus
Johnson, Magic	and Serena
Jordan, Michael	Woods, Tiger
Mays, Willie	Zaharias, Babe
Owens, Jesse	Didrikson

spotted hyena (mammal) *picture, volume 6 page 104*

hyena *volume 6 page 104*

spotted-tailed native cat (mammal)

marsupial *picture, volume 8 page 63*

spring (machine component)

clock *volume 3 page 140*

spring (place where water naturally flows from the ground)

Budapest *volume 2 page 141*

Reykjavik *volume 11 page 59*

Tbilisi *volume 13 page 24*

volcano *volume 14 page 101*

For more about sports, look for these articles:

Archery	Martial Art
Baseball	Olympic Games
Basketball	Rugby
Boxing	Skateboarding
Cricket	Skating
Cycling	Skiing
Football	Soccer
Golf	Softball
Gymnastics	Swimming
Hockey, Ice	Tennis
Ice Skating	Track and Field
Iditarod	Volleyball
Lacrosse	Wrestling
Marathon	

spring (season)

season *volume 12 page 61*

springbok (mammal)

herd in Kalahari desert *picture, volume 7*
page 44

spring equinox (astronomy): *see in index*
vernal equinox

Springfield (state capital of Illinois, U.S.)

MAIN ARTICLE *volume 12 page 168*

MORE TO EXPLORE

Illinois *volume 6 page 116*

images

Lincoln Home National Historic Site
picture, volume 6 page 118

Lincoln statue *picture, volume 12*
page 169

sprinkler system (irrigation tool)

farm in France *picture, volume 6*
page 162

irrigation *volume 6 page 161*

sprint (bicycle race)

cycling *volume 3 page 235*

sprint (footrace)

track and field *volume 13 page 84*

Spruce Knob (mountain in West Virginia, U.S.)

Allegheny Mountains *volume 1 page 83*

Sputnik 1 (Soviet artificial satellite)

rocket *volume 11 page 77*

satellite *volume 12 page 41*

space exploration *volume 12 page 151*

spy (intelligence)

MAIN ARTICLE *volume 12 page 169, picture, volume 12 page 169*

Squanto (Native American interpreter and guide)

MAIN ARTICLE *volume 12 page 170, picture, volume 12 page 170*

square (mathematics)

geometry *volume 5 page 98*

Square Deal (U.S. history)

Roosevelt *volume 11 page 94*

squash (plant and food)

MAIN ARTICLE *volume 12 page 171, picture, volume 12 page 171*

squid (mollusk)

MAIN ARTICLE *volume 12 page 171, picture, volume 12 page 172*

MORE TO EXPLORE

mollusk *volume 8 page 156, picture, volume 8 page 156*

squire (rank)

knight *volume 7 page 74*

squirrel (rodent)

MAIN ARTICLE *volume 12 page 172, picture, volume 12 page 172*

MORE TO EXPLORE

nest *volume 9 page 37*

tail *volume 13 page 6*

squirrel monkey (primate)

monkey *volume 8 page 168*

Sr. (father with same name as son): *see in index* Senior

Sri Jayewardenepura Kotte (judicial and legislative capital of Sri Lanka)

MAIN ARTICLE *volume 12 page 173*

MORE TO EXPLORE

Colombo *volume 3 page 154*

Sri Lanka *volume 12 page 174*

Sri Lanka (island country in the Indian Ocean)

MAIN ARTICLE *volume 12 page 174*

MORE TO EXPLORE

Colombo *picture, volume 3 page 154*

hospital *volume 6 page 88*

stilt fishers *picture, volume 12 page 174*

woman picking tea leaves *picture, volume 12 page 175*

St. (abbreviation): *see in index* saint

Stabroek (Dutch colonial city in Guyana): *see in index* Georgetown

stadium (architecture)

track and field *volume 13 page 84*

stag beetle (insect)

types of beetles *picture, volume 2*
page 49

stage (theater)

theater *volume 13* page 57

stage direction (theater)

drama *volume 4* page 72

stage manager (theater)

theater *volume 13* page 58

stage race (bicycle race)

cycling *volume 3* page 234

stainless steel (metal)

steel *volume 12* page 184

staircase (architectural feature)

decorated with tiles *picture, volume 2*
page 129

stalactite (mineral formation)

cave *volume 3* page 63, *picture, volume 3*
page 63

stalagmite (mineral formation)

Carlsbad Caverns *picture, volume 3*
page 62
cave *volume 3* page 63, *picture, volume 3*
page 63

Stalin, Joseph (prime minister of the Soviet Union)

MAIN ARTICLE *volume 12* page 176, *picture, volume 12* page 176

MORE TO EXPLORE

Soviet Union *volume 14* page 13
terrorism *volume 13* page 49
World War II *volume 15* page 70
meeting at Yalta *picture, volume 15*
page 70

Stalinabad (capital city of Tajikistan): *see in index* Dushanbe**Stalingrad, Battle of** (World War II)

World War II *volume 15* page 68

Stalwart (U.S. political faction)

Garfield *volume 5* page 88
Hayes *volume 6* page 30

stamen (botany)

flower *volume 5* page 38
images
cross-pollination *picture, volume 10*
page 117
parts of a flower *picture, volume 5*
page 38

self-pollination *picture, volume 10*
page 116

stammering (speech disorder): *see in index* stuttering**stamp** (postage)

MAIN ARTICLE *volume 12* page 177

MORE TO EXPLORE

images

Black Heritage *picture, volume 2*
page 26
Gadsden Purchase *picture, volume 5*
page 80
Khwarizmi, al- *picture, volume 7*
page 62
upside down picture *picture, volume 12* page 177
postal service *volume 10* page 136

Stamp Act (British law, 1765)

American Revolution *volume 1* page 99
Franklin *volume 5* page 64

stamp collecting (hobby) *picture, volume 6* page 65

stamp *volume 12* page 177
unusual stamp *picture, volume 12*
page 177

standard (measurement)

measurement *volume 8* page 88

standard language (legal designation): *see in index* official language**Standing Bear** (Ponca chief) *picture, volume 10* page 122**Stanley** (capital of Falkland Islands, United Kingdom)

Falkland Islands *volume 5* page 5

Stanley, Sir Henry Morton (British explorer)

exploration *volume 4* page 174
Kinshasa *volume 7* page 70

Stanton, Elizabeth Cady (U.S. suffragette)

MAIN ARTICLE *volume 12* page 178, *picture, volume 12* page 178

MORE TO EXPLORE

Anthony *volume 1* page 140
Mott *volume 8* page 194
women's rights *volume 15* page 57

stanza (literature)

poetry *volume 10* page 105

star (astronomy)

MAIN ARTICLE *volume 12* page 179, *picture, volume 12* page 179, *picture, volume 12* page 179

MORE TO EXPLORE

black hole *volume 2* page 88
celestial navigation *picture, volume 9*
page 25
constellation *picture, volume 3* page 188
galaxy *volume 5* page 81
Milky Way *volume 8* page 129
new stars forming *picture, volume 14*
page 37
prism *volume 10* page 154

starboard (nautical term)

boat *volume 2* page 97, *picture, volume 2*
page 97

starfish (class of echinoderm)

MAIN ARTICLE *volume 12* page 180, *picture, volume 12* page 180

MORE TO EXPLORE

mutation occurrence *picture, volume 8*
page 220

Starkey, Richard (British musician): *see in index* Starr, Ringo**Star Mosque** (building in Dhaka, Bangladesh)

Dhaka *volume 4* page 42

Starr, Ellen Gates (U.S. social reformer)

Addams *volume 1* page 28

Starr, Ringo (British musician)

the Beatles *volume 2* page 43

“Starry Night” (work by Van Gogh)

Van Gogh *volume 14* page 56

Stars and Stripes (U.S. flag) *volume 5* page 29

flag *volume 5* page 29
Independence Day parade *picture, volume 6* page 122
Ross *volume 11* page 98, *picture, volume 11* page 99

“Star-Spangled Banner, The” (U.S. national anthem)

Key *volume 7* page 60
national anthem *volume 9* page 12
sheet music *picture, volume 7* page 60

“Star Trek III: The Search for Spock”

(motion picture) *picture, volume 12*
page 50

Star Wars (United States defense system):
see in *index* Strategic Defense Initiative

state (U.S. political subdivision)
electoral college *volume 4 page 119*

State, Department of (U.S. government agency)
government executive departments
table, volume 14 page 35

State College of Agricultural and the Mechanic Arts (university in Orono, Maine, U.S.): see in *index* Maine, University of

State Department (U.S. government agency): see in *index* State, Department of

state education: see in *index* public education

state government
MAIN ARTICLE *volume 12 page 181, picture, volume 12 page 181, picture, volume 12 page 182*

State House (building in Concord, New Hampshire, U.S.) *picture, volume 3 page 175*

State House (building in Trenton, New Jersey, U.S.) *picture, volume 13 page 95*

Staten Island (island and borough in New York City, New York, U.S.)
New York City *volume 9 page 60*

State of Israel (country in the Middle East): see in *index* Israel

states' rights (government)
state government *volume 12 page 182*

static electricity (physics)
effect on a child's hair *picture, volume 4 page 121*
electricity *volume 4 page 120*

static equilibrium (physiology): see in *index* equilibrium

statistician: see in *index* statistics

statistics (science of analyzing numerical information)
MAIN ARTICLE *volume 12 page 182, picture, volume 12 page 182, table, volume 12 page 183*

statue (sculpture)
Great Sphinx at Giza *picture, volume 12 page 163*

Lincoln *picture, volume 12 page 169*
merlion *picture, volume 12 page 91*
monument in downtown Ashgabat *picture, volume 1 page 199*
Ramses II *picture, volume 10 page 69*

Statue of Liberty National Monument (monument in New York City, New York, U.S.): see in *index* Liberty, Statue of

Staufer dynasty (German dynasty): see in *index* Hohenstaufen family

stave (literature): see in *index* stanza

steam
boiling water *picture, volume 4 page 166*
states of matter *picture, volume 8 page 78*
water *volume 15 page 22*

steamboat (vessel) *picture, volume 8 page 141*
technology and invention *volume 13 page 27*

"Steamboat Willy" (animated film by Disney)
animation *volume 1 page 131*
Disney *volume 4 page 58*

steam engine (machine)
Industrial Revolution *volume 6 page 133*
navy *volume 9 page 26*
railroad *volume 11 page 21*
"Rocket" steam locomotive *picture, volume 11 page 21*
technology and invention *volume 13 page 26*
transportation *volume 13 page 92*

steel (metal alloy)
MAIN ARTICLE *volume 12 page 184, picture, volume 12 page 184*
MORE TO EXPLORE
alloy *volume 1 page 87*
architecture *volume 1 page 168*
iron *volume 6 page 158*
metal *volume 8 page 106*
skyscraper *volume 12 page 104*
steel sculpture by Picasso *picture, volume 10 page 79*
technology and invention *volume 13 page 26*

steel, stainless (metal): see in *index* stainless steel

steel industry
fire *picture, volume 5 page 25*
Pennsylvania *volume 10 page 57*
steel rolls in a mill *picture, volume 12 page 184*

steeplechase (athletics)
track and field *volume 13 page 86*

Stegosaurus (dinosaur)
MAIN ARTICLE *volume 12 page 184, picture, volume 12 page 185*

MORE TO EXPLORE
dinosaur *volume 4 page 51, picture, volume 4 page 53*
Ornithischian dinosaurs *picture, volume 4 page 50*

stem (plant part)
seed *volume 12 page 62*
vegetable *volume 14 page 60*

stem lettuce (vegetable)
lettuce *volume 7 page 135*

step (dance)
ballet *volume 2 page 13*

Stephen I (king of Hungary)
Hungary *volume 6 page 101*
statue in Budapest *picture, volume 2 page 141*

Stephenson, George (British inventor)
railroad *volume 11 page 21*
"Rocket" steam locomotive *picture, volume 11 page 21*

Stephenson, Robert (British engineer)
"Rocket" steam locomotive *picture, volume 11 page 21*

steppe (grassland)
grassland *volume 5 page 143*
Russia *volume 11 page 105*

Stepped pyramid (pyramid at Saqqarah in Egypt): see in *index* Step Pyramid

Step Pyramid (pyramid at Saqqarah in Egypt)
pyramid *volume 10 page 171*

steps (architectural feature): see in *index* staircase

stern (watercraft part)
boat *volume 2 page 97, picture, volume 2 page 97*
ship *volume 12 page 81*

stethoscope (instrument) *picture, volume 9 page 111*

Steuben, Frederick William, baron von
(U.S. military officer)
Valley Forge picture, volume 1 page 101

Stevenson, Robert Louis (British author)
Apia volume 1 page 149

Stewart, Henry (British lord): *see in index*
Darnley, Henry Stewart, Lord

stick insect (insect): *see in index* walking-stick

Stieler, Josef Karl (German painter)
Beethoven portrait picture, volume 2 page 47

still-life painting
painting volume 10 page 8

still rings (gymnastics): *see in index* rings

stingray (fish) picture, volume 11 page 30
ray volume 11 page 30

stink badger (mammal)
badger volume 2 page 6

stoat (mammal) picture, volume 15 page 27

stock (finance)
stock exchange volume 12 page 185

Stockbridge Indians (Native American people)
Mohican volume 8 page 153

stock exchange (finance)
MAIN ARTICLE volume 12 page 185, picture, volume 12 page 186

Stockholm (capital city of Sweden)
MAIN ARTICLE volume 12 page 187
MORE TO EXPLORE
Riddar Island picture, volume 12 page 187
Sweden volume 12 page 212, picture, volume 12 page 213

Stockholm Bloodbath (Swedish history)
Sweden volume 12 page 214

stock market (finance): *see in index* stock exchange

Stock Market Crash of 1929 (U.S. history)
stock exchange volume 12 page 186

Stoicism (philosophy)
human rights volume 6 page 97

stolen base (baseball)
Bell volume 2 page 59

stolon (plant part): *see in index* runner

stomach (anatomy)
MAIN ARTICLE volume 12 page 187, picture, volume 12 page 188

MORE TO EXPLORE
digestive system volume 4 page 47
frog picture, volume 4 page 48
grasshopper picture, volume 4 page 48
human picture, volume 4 page 47
proximity to liver picture, volume 7 page 167

stone (material)
architecture volume 1 page 168
Stonehenge picture, volume 12 page 190
quarrying picture, volume 11 page 7
sculpture volume 12 page 55

Stone Age (prehistoric period)
MAIN ARTICLE volume 12 page 188
MORE TO EXPLORE

Bronze Age volume 2 page 134
prehistoric life volume 10 page 146
technology and invention volume 13 page 25, picture, volume 13 page 25

stone fruit (botany): *see in index* drupe

Stonehenge (ancient monument in England, United Kingdom)
MAIN ARTICLE volume 12 page 190, picture, volume 12 page 190

Stone Mountain Park (park in Georgia, U.S.)
sculpture of Confederate leaders picture, volume 5 page 102

“Stone Soup” (U.S. magazine)
magazine cover picture, volume 8 page 14

stone-tool industry (archaeology)
Stone Age volume 12 page 188

stoneware (ceramics)
pottery volume 10 page 139

Stonies (Native American people): *see in index* Assiniboin

stony coral (invertebrate order)
coral volume 3 page 197

stopwatch
athletics picture, volume 13 page 67

storage (computing)
computer volume 3 page 173

stork (bird family)
MAIN ARTICLE volume 12 page 190
MORE TO EXPLORE
wood stork picture, volume 12 page 191

storm (weather)
MAIN ARTICLE volume 12 page 191, picture, volume 12 page 192, picture, volume 12 page 192

Storms, Cape of (promontory of South Africa): *see in index* Good Hope, Cape of

Storm Troopers (Nazi organization) picture, volume 9 page 26

storytelling (art form)
MAIN ARTICLE volume 12 page 193, picture, volume 12 page 193, picture, volume 12 page 194

MORE TO EXPLORE
mythology picture, volume 8 page 222

Stowe (town in Vermont, U.S.) picture, volume 14 page 68

Stowe, Harriet Beecher (U.S. writer and educator)
MAIN ARTICLE volume 12 page 194, picture, volume 12 page 195
MORE TO EXPLORE
abolitionist movement volume 1 page 12

straight angle (mathematics)
geometry volume 5 page 98

Strategic Defense Initiative (United States defense system)
Reagan volume 11 page 33

stratosphere (atmospheric region)
atmosphere volume 1 page 223

stratovolcano (landform)
volcano volume 14 page 101, picture, volume 14 page 101

stratus cloud
cloud volume 3 page 144, picture, volume 3 page 143

straw (agriculture)
grass volume 5 page 141

strawberry (plant and fruit)
MAIN ARTICLE volume 12 page 195, picture, volume 12 page 195
MORE TO EXPLORE
plant volume 10 page 96

strawweight (weight class in boxing)
boxing volume 2 page 118

- streaked tulip** (botany)
tulip *volume 13 page 106*
- stream of consciousness** (literary technique)
literature *volume 7 page 162*
- street** (transportation): *see in index* road
- street sign**
Quebec *picture, volume 11 page 9*
- street-style skateboarding** (sport)
skateboarding *volume 12 page 94*
- strep throat** (bacterial infection)
MAIN ARTICLE *volume 12 page 196, picture, volume 12 page 196*
- Streptococcus** (bacteria genus)
strep throat *volume 12 page 196*
- stress** (psychological and biological factor)
endocrine system *volume 4 page 136*
use of art therapy *picture, volume 8 page 101*
- striated muscle** (anatomy): *see in index* skeletal muscle
- strike** (baseball and softball)
baseball *volume 2 page 31*
softball *volume 12 page 123*
- strike** (employer-employee relations)
Coolidge *volume 3 page 194*
- strikeout** (baseball)
baseball *volume 2 page 31*
- striker** (cricket position) *picture, volume 3 page 215*
cricket *volume 3 page 214, picture, volume 3 page 214*
- striker** (soccer position): *see in index* forward
- strike zone** (sports)
baseball *volume 2 page 31*
- stringed instrument**
African stringed instrument *picture, volume 8 page 214*
modern orchestra seating arrangement *picture, volume 9 page 145*
music *volume 8 page 213*
musical instruments *volume 8 page 215, picture, volume 8 page 216*
orchestra *volume 9 page 145*
- string quartet** (music)
classical music *volume 3 page 132*
- stringybark tree**: *see in index* eucalyptus
- striped hyena** (mammal)
hyena *volume 6 page 104*
- striped skunk** (mammal) *picture, volume 12 page 103*
- strip mining**
coal *volume 3 page 144*
- Stroessner, Alfredo** (president of Paraguay)
Paraguay *volume 10 page 31*
- stroke play** (golf)
golf *volume 5 page 126*
- stronghold** (military science): *see in index* fortress
- strophe** (literature): *see in index* stanza
- Strzelecki Desert** (desert in South Australia, Australia) *picture, volume 12 page 145*
- Stuart, Gilbert** (U.S. painter)
George Washington *picture, volume 15 page 19*
- Stuart, Mary** (queen of Scotland): *see in index* Mary, Queen of Scots
- Student Nonviolent Coordinating Committee** (U.S. organization)
civil rights movement *volume 3 page 130*
- studio painting** (art): *see in index* easel painting
- stun gun** (weapon)
weapon *volume 15 page 26*
- stupa** (Buddhist monument)
architecture *volume 1 page 169*
- surgeon** (fish)
Caspian Sea *volume 3 page 51*
- stuttering** (speech disorder)
speech *volume 12 page 162*
- style of life**: *see in index* lifestyle
- stylus** (writing implement)
Braille *volume 2 page 121*
- sub** (ship): *see in index* submarine
- subacute meningitis** (disease): *see in index* viral meningitis
- subatomic particle** (physics)
atom *volume 1 page 224*
- subirrigation** (agriculture): *see in index* subsurface irrigation
- submarine** (ship)
MAIN ARTICLE *volume 12 page 196, picture, volume 12 page 197*
MORE TO EXPLORE
navy *volume 9 page 25*
oceanography *picture, volume 9 page 119*
World War I *volume 15 page 63*
- submarine canyon** (geological feature)
canyon formation *volume 3 page 31*
- subsoil** (geology)
soil *volume 12 page 125*
- substrate** (enzymatic reactions)
enzyme *volume 4 page 144*
- subsurface irrigation** (agriculture)
irrigation *volume 6 page 161*
- subsurface water** (water below Earth's surface): *see in index* groundwater
- suburb** *picture, volume 3 page 124*
city *volume 3 page 124*
- subway** (railroad)
railroad *volume 11 page 20*
- succulent** (type of plant)
cactus *volume 3 page 6*
- suckling** (physiology): *see in index* nursing
- Sucre** (judicial capital city of Bolivia)
MAIN ARTICLE *volume 12 page 198, picture, volume 12 page 198*
MORE TO EXPLORE
Bolivia *volume 2 page 102*
- sucrose** (chemical compound): *see in index* sugar
- Sudan, The** (country in Africa)
MAIN ARTICLE *volume 12 page 199*
MORE TO EXPLORE
geography
Khartoum mosque *picture, volume 7 page 61*
Middle East *volume 8 page 124*
village near the Nile River *picture, volume 12 page 200*
Sudanese man herding cattle *picture, volume 12 page 200*
- Sudanese Republic**: *see in index* Mali
- Sudetenland** (historical region in Europe)
Czechoslovakia *volume 3 page 238*

"Sue" (dinosaur fossil) *picture, volume 8 page 212*

Suez, Isthmus of (isthmus in Egypt)
Suez Canal *volume 12 page 201*

Suez Canal (canal in Egypt)
MAIN ARTICLE *volume 12 page 201*

MORE TO EXPLORE

canal *volume 3 page 28*
Egypt *volume 4 page 109*
Mediterranean Sea *volume 8 page 94*
Port Louis *volume 10 page 131*
Queen Victoria *volume 14 page 77*
Red Sea *volume 11 page 37*
transportation *volume 13 page 93*

suffrage (right to vote)
South Africa *picture, volume 3 page 128*
voting *volume 14 page 105*

sugar (chemical compound)
MAIN ARTICLE *volume 12 page 201, picture, volume 12 page 202*

MORE TO EXPLORE

crystal *volume 3 page 226, picture, volume 3 page 226*
Mauritius *volume 8 page 80*
sugarcane *picture, volume 12 page 201*

sugar beet (plant)
beet *volume 2 page 46*
root *picture, volume 11 page 96*
sugar *volume 12 page 202*

sugarcane (plant)
chopped stalks *picture, volume 12 page 201*
sugar *volume 12 page 202*

sugar glider (mammal)
marsupial *picture, volume 8 page 63*

Sugarhill Gang (U.S. music group)
hip-hop *volume 6 page 59*
rap music *volume 11 page 26*

Sugar Loaf (mountain in Brazil)
Rio de Janeiro *volume 11 page 67, picture, volume 11 page 67*

sugar maple (tree) *picture, volume 8 page 51*
maple *volume 8 page 52*

Suharto (president of Indonesia)
Indonesia *volume 6 page 131*

suicide bombing (violence)
terrorism *volume 13 page 49*

suit (law): *see in index* lawsuit

Sukarno (president of Indonesia)
Indonesia *volume 6 page 131*

Sukhothai (historical kingdom in Thailand)
Thailand *volume 13 page 55*

Sukuma (people)
Tanzania *volume 13 page 15*

Sulawesi tarsier (primate)
primate *picture, volume 10 page 149*

Sule Pagoda (pagoda in Yangon, Myanmar) *picture, volume 15 page 86*

Süleyman the Magnificent (Ottoman sultan)
Ottoman Empire *volume 9 page 156*

sulfuric acid (chemical compound)
acid and base *volume 1 page 17*

Sullivan, Anne (U.S. teacher): *see in index* Macy, Anne Sullivan

Sullivan, Louis (U.S. architect)
architecture *volume 1 page 171*

Sultan of Swat (U.S. baseball player): *see in index* Ruth, Babe

Sultan Zayed Mosque (mosque in Abu Dhabi, United Arab Emirates) *picture, volume 1 page 15*

Sumatra (island in Indonesia)
boy carrying jackfruit *picture, volume 6 page 131*

Sumatran rhinoceros (mammal)
rhinoceros *volume 11 page 59*

Sumer (ancient region in Iraq)
Mesopotamia *volume 8 page 104*

Sumerian (people)
abacus *volume 1 page 7*
army *volume 1 page 190*
Iraq *volume 6 page 152*
mythology *volume 8 page 223*
writing *volume 15 page 77*

Sumerian calendar
calendar *volume 3 page 10*

summer (season)
Rocky Mountains *picture, volume 11 page 79*
season *volume 12 page 61*

Summer Olympics: *see in index* Olympic Games

summer solstice (astronomy)
season *volume 12 page 61, picture, volume 12 page 61*

summer squash (plant and food) *picture, volume 12 page 171*
squash *volume 12 page 171*

sumo (sport) *picture, volume 15 page 73*
wrestling *volume 15 page 73*

Sumter, Fort (fort in Charleston, South Carolina, U.S.)
American Civil War *volume 1 page 96*
Davis *volume 4 page 19*

sun (astronomy)
MAIN ARTICLE *volume 12 page 202, picture, volume 12 page 203, picture, volume 12 page 203*

MORE TO EXPLORE

aurora *volume 1 page 228*
celestial navigation *picture, volume 9 page 25*
eclipse *volume 4 page 97, picture, volume 4 page 98, picture, volume 4 page 98*
energy *volume 4 page 137, picture, volume 4 page 139*
greenhouse effect *picture, volume 5 page 157*
heat *volume 6 page 32*
light *volume 7 page 148*
Milky Way *volume 8 page 129, picture, volume 8 page 129*
planets *volume 10 page 92, picture, volume 10 page 93*
season *volume 12 page 61, picture, volume 12 page 61*
solar system *volume 12 page 127*
tides *picture, volume 13 page 64*
time
clock *volume 3 page 141*
sundial *volume 12 page 204, picture, volume 12 page 204*
water *volume 15 page 23*

sun bear (mammal)
bear *volume 2 page 41*

sundial (timekeeping device)
MAIN ARTICLE *volume 12 page 204, picture, volume 12 page 204*
MORE TO EXPLORE
time *volume 13 page 69*

Sundiata (king of Mali)
Ghana Empire *volume 5 page 112*
Mali empire *volume 8 page 33*

sunflower (plant and flower)

MAIN ARTICLE *volume 12 page 204, picture, volume 12 page 204*

MORE TO EXPLORE

sunflower crop in Kansas *picture, volume 7 page 47*

Sunflower State (state in the U.S.): *see in index* Kansas

sun (mammal)

antelope types *picture, volume 1 page 139*

sunlight (solar radiation)

climate *volume 3 page 137*

energy source *picture, volume 4 page 139*

photosynthesis *volume 10 page 78*

rainbow *volume 11 page 22*

Sunnite (Islam)

Caliphate *volume 3 page 14*

Islam *volume 6 page 164*

Kurds *volume 7 page 90*

Sun Records (U.S. record company)

Presley *volume 10 page 147*

Sunshine State (state in the U.S.): *see in index* Florida

sunspot (astronomy)

sun *volume 12 page 203, picture, volume 12 page 203*

Sun Yat-sen (Chinese leader)

MAIN ARTICLE *volume 12 page 205, picture, volume 12 page 205*

MORE TO EXPLORE

China *volume 3 page 104*

Super Bowl (U.S. football championship)

football *volume 5 page 50*

supercomputer

computer *volume 3 page 172*

supergiant slalom (ski race)

Alpine skiing courses *picture, volume 12 page 98*

skiing *volume 12 page 99*

superhighway (road): *see in index* expressway

Superior, Lake (lake in North America)

MAIN ARTICLE *volume 12 page 206, picture, volume 12 page 206*

MORE TO EXPLORE

facts about North America *volume 9 page 83*

Great Lakes *volume 5 page 147*

supernova (astronomy)

star *volume 12 page 180*

supply (economic force): *see in index* supply and demand

supply and demand (economic force)

economics *volume 4 page 100*

village market *picture, volume 4 page 100*

supportive tissue (anatomy): *see in index* skeleton

supreme being: *see in index* god

Supreme Court of the United States: *see in index* United States Supreme Court

sura (chapter of Koran)

Koran *volume 7 page 78*

surface irrigation (agriculture)

irrigation *volume 6 page 161*

surface runoff (hydrology): *see in index* runoff

surfing (water sport)

skateboarding *volume 12 page 94*

surgeon (medical doctor)

operating room *picture, volume 12 page 207*

surgery *volume 12 page 207*

surgery (medical procedure)

MAIN ARTICLE *volume 12 page 207, picture, volume 12 page 207*

MORE TO EXPLORE

X-ray *picture, volume 8 page 93*

Suriname (country in South America)

MAIN ARTICLE *volume 12 page 208*

MORE TO EXPLORE

Paramaribo *picture, volume 10 page 32*
Presidential Palace in Paramaribo *picture, volume 12 page 208*

Surrealism (art and literature)

painting *volume 10 page 11*

survival of the fittest (biology)

mimicry *volume 8 page 131*

Suryavarman II (king of Khmer empire)

Angkor Wat *volume 1 page 120*

suspension bridge (transportation structure)

bridge *volume 2 page 130, picture, volume 2 page 130*

suspension system (vehicles)

automobile *volume 1 page 236*

Susu (people)

Ghana Empire *volume 5 page 112*

Guinea *volume 5 page 169*

Suthu (people): *see in index* Sotho

Suto (people): *see in index* Sotho

Sutter, John Augustus (U.S. pioneer)
Sacramento *volume 12 page 5*

Suva (capital city of Fiji)

MAIN ARTICLE *volume 12 page 209*

MORE TO EXPLORE

Fiji *volume 5 page 19*

Parliament House *picture, volume 12 page 209*

Sveti Stefan (resort and former monastery in Adriatic Sea, Montenegro) *picture, volume 8 page 175*

Swahili language (African language)
Tanzania *volume 13 page 16*

Swaledale (breed of sheep) *picture, volume 12 page 79*

swallowing (physiology)

tongue *volume 13 page 80*

Swallow's Nest Castle (castle in Yalta, Ukraine) *picture, volume 4 page 164*

swamp (wetland)

MAIN ARTICLE *volume 12 page 209, picture, volume 12 page 209*

MORE TO EXPLORE

marsh *volume 8 page 60*

wetland *volume 15 page 36*

swan (waterfowl)

MAIN ARTICLE *volume 12 page 210*

MORE TO EXPLORE

building a nest *picture, volume 4 page 101*

goose *volume 5 page 127*

mute swan *picture, volume 12 page 210*

"Swan Lake" (ballet by Tchaikovsky)
picture, volume 2 page 14

SWAPO (political party in Namibia): *see in index* South West Africa People's Organization

swarming (animal behavior)

krill *volume 7 page 88, picture, volume 7 page 87*

locust *volume 7 page 173*

Swazi (people)Swaziland *volume 12 page 211***Swaziland** (kingdom in Africa)MAIN ARTICLE *volume 12 page 211*

MORE TO EXPLORE

Mbabane market *picture, volume 8 page 85*Reed Dance ceremony *picture, volume 12 page 211***sweat gland** (anatomy)skin *volume 12 page 101***Sweden** (country in Europe)MAIN ARTICLE *volume 12 page 212*

MORE TO EXPLORE

geography

Baltic Sea *picture, volume 2 page 17*Kristianstad *picture, volume 12 page 212*railway station *picture, volume 12 page 213*Stockholm *picture, volume 12 page 187, picture, volume 12 page 213*

history

Finland *volume 5 page 23*Norway *volume 9 page 98*Peter the Great *volume 10 page 67*polar exploration *volume 10 page 110*timeline *volume 12 page 212***sweet almond** (tree and nut)almond *volume 1 page 87***sweet bay** (tree and shrub): *see in index laurel***sweet-cherry** (tree and fruit)cherry *volume 3 page 89***sweet orange** (fruit)orange *volume 9 page 143***sweet pepper** (plant): *see in index bell pepper***sweet potato** (plant and edible root)MAIN ARTICLE *volume 12 page 215, picture, volume 12 page 215*

MORE TO EXPLORE

Carver *volume 3 page 51***Swift, Jonathan** (Irish author and clergyman)literature for children *volume 7 page 163***Swilling, Jack** (U.S. pioneer)Phoenix *volume 10 page 75***swimming** (sport)MAIN ARTICLE *volume 12 page 215*

MORE TO EXPLORE

Olympic Games *volume 9 page 133***swimming** (form of locomotion)fish *volume 5 page 28***swing** (music)jazz *volume 7 page 16***Swiss chard** (plant)beet *volume 2 page 46***Switzerland** (country in Europe)MAIN ARTICLE *volume 12 page 218*

MORE TO EXPLORE

small village near the Alps *picture, volume 12 page 218***swordfish** (fish)MAIN ARTICLE *volume 12 page 220, picture, volume 12 page 220***Sydney** (city in New South Wales, Australia)MAIN ARTICLE *volume 12 page 220*

MORE TO EXPLORE

colony *picture, volume 3 page 155*New South Wales *volume 9 page 53*Sydney Opera House *picture, volume 12 page 221***Sydney Harbour Bridge** (bridge in Sydney, North South Wales, Australia)Sydney *volume 12 page 220***Sydney Opera House** (building in Sydney, New South Wales, Australia) *picture, volume 12 page 221*New South Wales *volume 9 page 53*Sydney *volume 12 page 220***symbiosis** (biological process)MAIN ARTICLE *volume 12 page 221, picture, volume 12 page 221*

MORE TO EXPLORE

lichen *volume 7 page 146***symbol, chemical** (scientific abbreviation): *see in index chemical symbol***symphony** (music)Beethoven *volume 2 page 47*classical music *volume 3 page 132*music *volume 8 page 213***“Symphony No. 9 in D Minor”** (work by Beethoven): *see in index “Ninth Symphony”***synagogue** (place of worship)MAIN ARTICLE *volume 12 page 222, picture, volume 12 page 222*

MORE TO EXPLORE

Judaism *volume 7 page 37*temple *volume 13 page 42*Torah *volume 13 page 82***synthetic gem** (chemical compound)jewelry and gems *volume 7 page 25***Syria** (country in the Middle East)MAIN ARTICLE *volume 12 page 223, picture, volume 12 page 224, picture, volume 12 page 224*

MORE TO EXPLORE

geography

Damascus *picture, volume 4 page 10*Middle East *volume 8 page 124*

history

Arab-Israeli Wars *volume 1 page 158*Israel *volume 6 page 169*Lebanon *volume 7 page 121*World War I *volume 15 page 63***Syrian Desert** (desert in the Middle East)Syria *volume 12 page 223***syrinx** (bird anatomy)songbird *volume 12 page 132***systematics** (biological classification): *see in index taxonomy***systemic circulation** (physiology)cardiovascular system *volume 3 page 39***tabasco** (plant)pepper *volume 10 page 59***tabby** (cat)cat *volume 3 page 56***table beet** (plant): *see in index garden beet***table salt** (sodium chloride): *see in index salt***tackle** (sports)rugby *volume 11 page 103*soccer *volume 12 page 117*

tadpole (animal stage)
 frog *volume 5 page 71*
 metamorphosis *volume 8 page 108, picture, volume 8 page 107*
 toad *volume 13 page 73*

Tadzhik (people): *see in index* Tajik

tae kwon do (martial art)
 martial arts *volume 8 page 65*

Taft, William Howard (president and chief justice of the U.S.)
 MAIN ARTICLE *volume 13 page 4, picture, volume 13 page 4*
 MORE TO EXPLORE
 timeline *volume 13 page 4*

Tagore, Rabindranath (Bengali poet)
 national anthem *volume 9 page 13*

Tahat, Mount (mountain in Algeria)
 Algeria *volume 1 page 78*

Tahoe, Lake (lake in the U.S.)
 Nevada *volume 9 page 40*

taiga (life zone)
 MAIN ARTICLE *volume 13 page 5, picture, volume 13 page 5*
 MORE TO EXPLORE
 biome *volume 2 page 74*
 Russia *volume 11 page 104*

taikonaut (space explorer): *see in index* astronaut

tail (anatomy)
 MAIN ARTICLE *volume 13 page 6*
 MORE TO EXPLORE
 opossum *picture, volume 13 page 6*

tail (aircraft structure)
 airplane *volume 1 page 54*

tail feather (bird anatomy)
 feather *volume 5 page 9*

tail rotor (helicopter part)
 helicopter *volume 6 page 35*
 parts of a helicopter *picture, volume 6 page 35*

Taino (Native American people)
 Arawak *volume 1 page 162*
 Cuba *volume 3 page 228*
 Puerto Rico *volume 10 page 165*

Taipei (capital city of Taiwan)
 MAIN ARTICLE *volume 13 page 7, picture, volume 13 page 7*
 MORE TO EXPLORE
 Taiwan *volume 13 page 8*

Taipei 101 (building in Taipei, Taiwan)
 four of the world's tallest buildings *picture, volume 12 page 104*

Taitu (empress of Ethiopia)
 Addis Ababa *volume 1 page 29*

Taiwan (self-governing island in Asia)
 MAIN ARTICLE *volume 13 page 8*
 MORE TO EXPLORE
 Buddha statues *picture, volume 13 page 9*
 Chiang *volume 3 page 92*
 Taipei *picture, volume 13 page 7*

Tajik (people)
 Afghanistan *volume 1 page 36*
 Tajikistan *volume 13 page 10*

Tajikistan (country in Asia)
 MAIN ARTICLE *volume 13 page 10*
 MORE TO EXPLORE
 monument in Dushanbe *picture, volume 4 page 83*
 snow-covered peaks of Pamir Mountains *picture, volume 13 page 10*

Taj Mahal (mausoleum in Agra, India)
 MAIN ARTICLE *volume 13 page 11, picture, volume 13 page 11*
 MORE TO EXPLORE
 architecture *volume 1 page 171*

Tajumulco Volcano (mountain in Guatemala)
 Central America *volume 3 page 74*
 Guatemala *volume 5 page 166*

Talbot, William Henry Fox (British inventor)
 camera *volume 3 page 21*
 photography *volume 10 page 77*

Taleban (Islamic militia): *see in index* Taliban

"Tale of Genji, The" (work by Murasaki)
 literature *volume 7 page 161*

"Tale of Two Cities, A" (work by Dickens)
 Dickens *volume 4 page 45*

"Tales, Told for Children" (work by Andersen)
 Andersen *volume 1 page 116*

"Tales of Mother Goose" (fairy tales by Perrault)
 Mother Goose *volume 8 page 191*

Taliban (Islamic militia and ruling faction in Afghanistan)
 Afghanistan *volume 1 page 37*
 Kabul *volume 7 page 43*

Tallahassee (state capital of Florida, U.S.)
 MAIN ARTICLE *volume 13 page 11, picture, volume 13 page 12*
 MORE TO EXPLORE
 Florida *volume 5 page 34*

Tallchief, Maria (U.S. dancer)
 MAIN ARTICLE *volume 13 page 12, picture, volume 13 page 12*

Tall Corn State (state in the U.S.): *see in index* Iowa

Tallinn (capital city of Estonia)
 MAIN ARTICLE *volume 13 page 13*
 MORE TO EXPLORE

Alexander Nevsky Cathedral *picture, volume 13 page 13*
 Estonia *volume 4 page 154*

tally system (mathematics)
 numbers and number systems *volume 9 page 106*

Talmud (Judaism)
 MAIN ARTICLE *volume 13 page 13, picture, volume 13 page 14*
 MORE TO EXPLORE
 Judaism *volume 7 page 37*

talon (anatomy): *see in index* claw

tamarack (tree): *see in index* eastern larch

tamarin (monkey) *picture, volume 8 page 167*

Tamerlane (Mongol conqueror): *see in index* Timur Lenk

Tamesis (river in England, United Kingdom): *see in index* Thames River

Tamias (mammal genus): *see in index* chipmunk

Tamil (people)
 Sri Lanka *volume 12 page 174*

taming of animals: *see in index* domestication of animals and plants

Tananarive (capital city of Madagascar): *see in index* Antananarivo

Tanganyika (former British territory in Tanzania)
 Tanzania *volume 13 page 15*

Tanganyika, Lake (lake in Africa)

MAIN ARTICLE *volume 13 page 14*

tango (dance) *picture, volume 4 page 12*

tank (military vehicle) *picture, volume 15 page 10*

World War I *volume 15 page 63*

tanker (ship)

ship *volume 12 page 82*

unloading petroleum in California *picture, volume 10 page 68*

tanker truck (fire truck)

firefighting *volume 5 page 26*

tannin (biochemistry)

hemlock *volume 6 page 38*

mangrove *volume 8 page 42*

Paraguay *volume 10 page 30*

Tantrism (Buddhism and Hinduism)

Hinduism *volume 6 page 57*

Tanzania (country in Africa)

MAIN ARTICLE *volume 13 page 15*

MORE TO EXPLORE

geography

Dar es Salaam *picture, volume 4 page 16*

Mount Kilimanjaro *volume 7 page 65, picture, volume 7 page 65*

Ngorongoro Crater *picture, volume 13 page 15*

Masai men rest from herding cattle *picture, volume 13 page 16*

Taoism (Chinese philosophy and religion): *see in index* Daoism

Taos (city in New Mexico, U.S.)

adobe Taos Pueblo *picture, volume 1 page 30*

“Tao-te Ching” (Chinese literature): *see in index* “Daodejing”

tape cassette: *see in index* cassette

tape recorder (audio equipment)

sound recording *volume 12 page 136*

tapestry (handweaving)

unicorn design *picture, volume 1 page 129*

tapir (mammal)

MAIN ARTICLE *volume 13 page 17, picture, volume 13 page 17*

taproot (root system)

root *volume 11 page 96*

sugar beet *picture, volume 11 page 96*

Tara Masjid (building in Dhaka, Bangladesh): *see in index* Star Mosque

Tarawa Atoll (atoll of Gilbert Islands of Kiribati, Pacific Ocean) *picture, volume 2 page 10*

Bairiki *volume 2 page 10*

target archery: *see in index* archery

target cell (biology)

hormone *volume 6 page 84*

Tarheel State (state in the U.S.): *see in index* North Carolina

tarsier (primate)

MAIN ARTICLE *volume 13 page 17, picture, volume 13 page 17*

tartar (dentistry)

dentistry *volume 4 page 38*

tart cherry (tree and fruit): *see in index* sour-cherry

Tashkent (capital city of Uzbekistan)

MAIN ARTICLE *volume 13 page 18*

MORE TO EXPLORE

Tashkent museum *picture, volume 13 page 18*

Uzbekistan *volume 14 page 47*

Tasman, Abel (Dutch explorer and navigator)

Australia *volume 1 page 231*

Tasmania *volume 13 page 20*

Tasmania (island state in Australia)

MAIN ARTICLE *volume 13 page 19, picture, volume 13 page 20*

Tasmanian tiger (extinct mammal): *see in index* thylacine

Tasmanian wolf (extinct mammal): *see in index* thylacine

taste (sense)

senses *volume 12 page 68, picture, volume 12 page 68*

tongue *volume 13 page 80*

taste bud (anatomy)

senses *volume 12 page 68*

tongue *volume 13 page 80, picture, volume 13 page 80*

Tatar (Eurasian people)

Crimea *volume 3 page 217*

Genghis Khan *volume 5 page 95*

Taufa’ahau (king of Tonga): *see in index* George Tupou I

Taurus (astronomy)

constellation *volume 3 page 188*

zodiac signs *picture, volume 15 page 107*

tax (economics): *see in index* taxation

taxation (economics)

MAIN ARTICLE *volume 13 page 20, picture, volume 13 page 22*

MORE TO EXPLORE

American Revolution *volume 1 page 99*

Millennium Park, Chicago, Illinois, U.S. *picture, volume 13 page 21*

state government *volume 12 page 182*

taxonomy (biological classification)

kingdom *picture, volume 7 page 168*

living thing *volume 7 page 169*

Taylor, Zachary (president of U.S.)

MAIN ARTICLE *volume 13 page 22, picture, volume 13 page 22*

MORE TO EXPLORE

Mexican War *volume 8 page 109*

Battle of Buena Vista *picture, volume 8 page 109*

timeline *volume 13 page 22*

Ta Yün-ho (canal in China): *see in index* Grand Canal

TB (disease): *see in index* tuberculosis

Tbilisi (capital city of Georgia)

MAIN ARTICLE *volume 13 page 23, picture, volume 13 page 24*

MORE TO EXPLORE

Georgia *volume 5 page 103*

T cell (part of the immune system)

immune system *volume 6 page 119*

lymphatic system *volume 7 page 191*

Tchaikovsky, Pyotr Ilyich (Russian composer)

ballet *volume 2 page 14*

classical music *volume 3 page 132*

tea (drink)

MAIN ARTICLE *volume 13 page 24*

Teach, Edward (English pirate): *see in index* Blackbeard

teacher: *see in index* teaching

teaching

education history *volume 4 page 107*

elementary school classroom *picture*,
volume 4 page 106

team sports

sports *volume 12 page 168*

tea plant

farmworker in Sri Lanka *picture*, *vol-*
ume 12 page 175

tea *volume 13 page 24*

tea harvest in Malaysia *picture*, *vol-*
ume 13 page 24

Teapot Dome Scandal (U.S. history)

Harding *volume 6 page 18*

technology

MAIN ARTICLE *volume 13 page 25*

MORE TO EXPLORE

dialysis machine *picture*, *volume 13*
page 29

Edison with lightbulb *picture*, *vol-*
ume 13 page 27

Stone Age tool *picture*, *volume 13*
page 25

windmill and waterwheel *picture*, *vol-*
ume 13 page 26

*For more about technology, look for
these articles:*

Airplane	Internet
Automobile	Irrigation
Battery	Laser
Binoculars	Machine
Calendar	Microscope
Camera	Morse Code
Catapult	Printing
Clock	Radar
Compact Disc	Radio
Computer	Railroad
Electricity	Robot
Electronic	Rocket
Games	Telecommunica-
Fiber Optics	tion
Gyroscope	Telegraph
Helicopter	Telephone
Internal-	Telescope
Combustion	Television
Engine	X-rays

tectonics (geology): *see in index* plate
tectonics

Tecumseh (Shawnee chief)

MAIN ARTICLE *volume 13 page 29*, *picture*,
volume 13 page 30

MORE TO EXPLORE

Harrison *volume 6 page 22*

Shawnee *volume 12 page 78*

teeing ground (golf)

golf *volume 5 page 124*

teenager (stage of human development):

see in index adolescence

teeth (anatomy): *see in index* tooth

Tegucigalpa (capital city of Honduras)

MAIN ARTICLE *volume 13 page 32*, *picture*,
volume 13 page 32

MORE TO EXPLORE

Honduras *volume 6 page 77*

Teheran (Iran): *see in index* Tehran

Tehillim (biblical text): *see in index*

Psalms

Tehran (capital city of Iran)

MAIN ARTICLE *volume 13 page 32*

MORE TO EXPLORE

bazaar *picture*, *volume 13 page 33*

Iran *volume 6 page 147*

Tel Aviv-Yafo (city in Israel)

MAIN ARTICLE *volume 13 page 33*, *picture*,
volume 13 page 33

telecommunication

MAIN ARTICLE *volume 13 page 34*

MORE TO EXPLORE

communication *volume 3 page 167*

industry *volume 6 page 135*

radiation *volume 11 page 17*

radio *volume 11 page 19*

telecommunication antennas *picture*,
volume 13 page 34

telecommunications systems: *see in*
index telecommunication

telegraph (communications system)

MAIN ARTICLE *volume 13 page 35*, *picture*,
volume 13 page 35

MORE TO EXPLORE

Edison *volume 4 page 105*

Marconi *volume 8 page 54*, *picture*, *vol-*
ume 8 page 53

Morse Code *volume 8 page 185*

technology and invention *volume 13*
page 27

telecommunication *volume 13 page 34*

telephone (communication device)

MAIN ARTICLE *volume 13 page 36*, *picture*,
volume 13 page 37

MORE TO EXPLORE

Bell *volume 2 page 58*, *picture*, *volume 2*
page 58

fiber optics *volume 5 page 15*

technology and invention *volume 13*
page 27

telecommunication *volume 13 page 34*

telescope (instrument)

MAIN ARTICLE *volume 13 page 38*, *picture*,
volume 13 page 38, *picture*, *volume 13*
page 39

MORE TO EXPLORE

astronomy *volume 1 page 215*, *picture*,
volume 1 page 214

Galileo *volume 5 page 82*

Uranus *volume 14 page 38*

X-ray *volume 15 page 82*

television (broadcasting)

MAIN ARTICLE *volume 13 page 39*

MORE TO EXPLORE

censorship *volume 3 page 69*

deafness *volume 4 page 21*

plasma display *picture*, *volume 13*
page 40

retail business competition *picture*, *vol-*
ume 3 page 34

telecommunication *volume 13 page 34*

transmission *picture*, *volume 13 page 40*

video recording *volume 14 page 80*

Tell, the (region in Algeria)

Algeria *volume 1 page 78*

Temasek (island nation in Southeast

Asia): *see in index* Singapore

Temne (people)

Sierra Leone *volume 12 page 85*

temperance movement (social history)

Anthony *volume 1 page 140*

temperate desert (geography): *see in*

index cold desert

temperate rain forest (botany)

rain forest *volume 11 page 23*

temperate rainforest (botany): *see in*

index temperate rain forest

temperature (measurement of hotness or

coldness)

climate *volume 3 page 137*

season *volume 12 page 61*

weather *volume 15 page 27*

temple (building for worship)

MAIN ARTICLE *volume 13 page 42*

MORE TO EXPLORE

Baha'i temple *picture*, *volume 2 page 7*

Buddhist temples *picture, volume 1 page 121, picture, volume 1 page 203, picture, volume 8 page 81, picture, volume 8 page 221, picture, volume 13 page 42, picture, volume 14 page 83*
 Mayan temple *picture, volume 3 page 75*
 Shinto temple *picture, volume 12 page 80*
 Temple Square *picture, volume 8 page 182*

Temple of: *see in index under the specific part of the name, for example, Apollo, Temple of*

tempo (music)
 music *volume 8 page 212*

Temuchin (Mongolian emperor): *see in index* Genghis Khan

Temüjin (Mongolian emperor): *see in index* Genghis Khan

Ten Commandments (Old Testament)
 Judaism *volume 7 page 37*
 Moses *volume 8 page 188*

tendon (anatomy)
 knee joint in cross section *picture, volume 12 page 97*
 muscle *picture, volume 8 page 208*
 skeletal system *volume 12 page 97*

Tennessee (state in the U.S.)
 MAIN ARTICLE *volume 13 page 43*
 MORE TO EXPLORE
 Jackson *volume 7 page 5*
 Nashville *picture, volume 13 page 44*

Tennessee River (river in the U.S.)
 Ohio River *volume 9 page 127*

Tennessee Valley Authority (U.S. government agency)
 New Deal *volume 9 page 44*
 Tennessee *volume 13 page 44*

Tenniel, Sir John (English artist)
 “Alice’s Adventures in Wonderland” *picture, volume 3 page 43*

tennis (sport)
 MAIN ARTICLE *volume 13 page 45, picture, volume 13 page 45, picture, volume 13 page 46*
 MORE TO EXPLORE
 Williams sisters *volume 15 page 44*

tennis ball (sports equipment)
 tennis *volume 13 page 45*

Tenochtitlán (historic city in Mexico)
 Aztec *volume 1 page 240*
 Cortés *volume 3 page 201, picture, volume 3 page 201*

tension (psychological and biological factor): *see in index* stress

tentacle (invertebrate anatomy)
 jellyfish *volume 7 page 19*
 sea anemone *volume 12 page 57*

“Tenth Muse, The” (poems by Bradstreet) *picture, volume 2 page 120*
 Bradstreet *volume 2 page 120*

Tenzing Norgay (Nepalese mountaineer)
 MAIN ARTICLE *volume 13 page 46*
 MORE TO EXPLORE
 Hillary *volume 6 page 54*
 Himalayas *volume 6 page 55*
 Mount Everest *volume 4 page 167*

Tenzin Gyatso (14th Dalai Lama) *picture, volume 4 page 7*
 Dalai Lama *volume 4 page 8*

Teotihuacán (ancient city in Mexico)
 pyramids *volume 10 page 171, picture, volume 8 page 110*

tepee (dwelling)
 Blackfoot *volume 2 page 85*
 Chipewyan *picture, volume 3 page 106*
 Crow *volume 3 page 222*
 Flathead *volume 5 page 32*
 Wichita *volume 15 page 43*
 Yakama *picture, volume 15 page 85*

Teresa, Mother (Roman Catholic nun)
 MAIN ARTICLE *volume 13 page 47, picture, volume 13 page 47*

termite (insect)
 MAIN ARTICLE *volume 13 page 47, picture, volume 13 page 48*
 MORE TO EXPLORE
 aardvark *volume 1 page 6*
 insect *volume 6 page 139*
 nest *volume 9 page 37*

tern (bird)
 gull *volume 5 page 171*

terrace cultivation (agriculture)
 Machu Picchu *volume 8 page 8*

terra-cotta tile (building material)
 brick and tile *volume 2 page 129*

Terrell, Ernie (U.S. boxer)
 fighting Ali *picture, volume 1 page 82*

terrestrial planet (astronomy)
 planets *volume 10 page 92, picture, volume 10 page 93*

terrier (dog group)
 dog *table, volume 4 page 62*

territorial behavior (biology)
 mammal *volume 8 page 36*
 dog *volume 4 page 63*
 songbird *volume 12 page 132*

Territory of: *see in index under the specific part of the name, for example, Guam*

Terror, Reign of (French history)
 French Revolution *volume 5 page 70*
 Robespierre *picture, volume 5 page 70*

terrorism
 MAIN ARTICLE *volume 13 page 48*
 MORE TO EXPLORE

bin Laden *volume 2 page 71*
 crime *volume 3 page 216*
 Libya *volume 7 page 145*
 London *volume 7 page 176*
 terrorist attack investigation *picture, volume 10 page 112*
 NATO *volume 9 page 84*
 Pakistan *volume 10 page 15*
 police *volume 10 page 112*
 Spain *volume 12 page 156*
 Madrid *volume 8 page 14*
 United States *volume 14 page 31*
 Bush *volume 2 page 157*
 New York City *volume 9 page 60*
 Pentagon after 9/11 attack *picture, volume 13 page 49*

testa (botany): *see in index* seed coat

testes (anatomy)
 endocrine system *volume 4 page 136, picture, volume 4 page 135*
 reproductive system *volume 11 page 47*
 human reproductive system *picture, volume 11 page 47*

Teton (Native American people): *see in index* Lakota

Teton Range (mountain range in Wyoming, U.S.)
 Wyoming *picture, volume 15 page 79*

tetragon (mathematics): *see in index* quadrilateral

Teutonic Order (religious order)
 Prussia *volume 10 page 161*

tewaraathon (sport): *see in index* lacrosse

Texas (state in the U.S.)

MAIN ARTICLE *volume 13 page 50*

MORE TO EXPLORE

geography

Gulf coast *picture, volume 13 page 51*

Rio Grande *picture, volume 9 page 79*

San Antonio café *picture, volume 13 page 52*

history

Alamo *volume 1 page 62*

Bush *volume 2 page 156*

Mexican War *volume 8 page 109, volume 8 page 112*

Polk *volume 10 page 116*

Tyler *volume 13 page 124*

United States *volume 14 page 29*

Texas longhorn (breed of cattle): *see in index* longhorn

Texas Medical Center (medical center in Houston, Texas, U.S.)
Houston *volume 6 page 89*

textile

MAIN ARTICLE *volume 13 page 53, picture, volume 13 page 53*

MORE TO EXPLORE

images

power looms *picture, volume 6 page 134*

shop in Nouakchott *picture, volume 9 page 100*

silk cloth *picture, volume 12 page 89*

technology and invention *volume 13 page 26*

Thailand (country in Southeast Asia)

MAIN ARTICLE *volume 13 page 54, picture, volume 13 page 54, picture, volume 13 page 55*

MORE TO EXPLORE

geography

Asia *volume 1 page 200*

Bangkok *picture, volume 2 page 20, picture, volume 13 page 42*

traditional dance *picture, volume 4 page 13*

Thames, Battle of the (War of 1812)
Harrison *volume 6 page 23*

Thames River (river in England, United Kingdom)

MAIN ARTICLE *volume 13 page 56, picture, volume 13 page 56*

MORE TO EXPLORE

London Eye *picture, volume 7 page 176*

Thanksgiving (holiday)

MAIN ARTICLE *volume 13 page 56, picture, volume 13 page 57*

MORE TO EXPLORE

Massasoit *volume 8 page 75*

thatching (construction method)

Natchez house *picture, volume 9 page 12*

That Luang (temple in Vientiane, Laos)
picture, volume 14 page 83

Thayendanegea (Mohawk chief): *see in index* Brant, Joseph

theater (art form and building)

MAIN ARTICLE *volume 13 page 57*

MORE TO EXPLORE

“A Midsummer Night’s Dream” *picture, volume 4 page 73*

architecture

Afghanistan *picture, volume 13 page 59*

Globe Theater *picture, volume 13 page 58*

Roman theater in Jordan *picture, volume 1 page 108*

Roman theater in Libya *picture, volume 7 page 145*

Bunraku puppet theater *picture, volume 13 page 59*

“The Piano Lesson” *picture, volume 4 page 74*

“Where the Wild Things Are” *picture, volume 4 page 72*

theater-in-the-round (theater): *see in index* arena stage

theatrical dance

dance *volume 4 page 13*

Thebes (ancient city in Egypt)

ancient Egypt *volume 4 page 113*

Theodora (Byzantine empress)

mosaic portrait *picture, volume 2 page 159*

Theodore Roosevelt National Park

(national park in North Dakota, U.S.)
Badlands region *picture, volume 9 page 88*

Theophrastus (Greek philosopher)

botany *volume 2 page 115*

theory

science *volume 12 page 50*

Theotokópoulos, Doménikos (Cretan-born Spanish painter): *see in index* Greco, El

Thera (island in Greece)

Oía *picture, volume 5 page 152*

Theravada (Buddhism)

Buddhism *volume 2 page 144*

thermal spring (place where water naturally flows from the ground): *see in index* spring

thermometer (measuring instrument)

weather *volume 15 page 28*

thermonuclear bomb (fusion device)

bomb *volume 2 page 104*

thermos (insulated flask): *see in index* vacuum bottle

thermosphere (atmospheric region)

atmosphere *volume 1 page 223*

theropod (dinosaur suborder)

dinosaur *volume 4 page 51*

Tyrannosaurus rex *volume 13 page 125*

Theropoda (dinosaur suborder): *see in index* theropod

“The Three Little Pigs” (fable): *see in index* “Three Little Pigs, The”

Thimphu (capital city of Bhutan)

MAIN ARTICLE *volume 13 page 60, picture, volume 13 page 60*

MORE TO EXPLORE

Bhutan *volume 2 page 66*

Third Crusade (European, Christian and Islamic history): *see in index* Crusades

third-degree burn (injury)

burn and scald *volume 2 page 152*

third molar (anatomy): *see in index* wisdom tooth

third position (ballet)

ballet positions *picture, volume 2 page 14*

Third Reich (historic empire in Europe)

Germany *volume 5 page 106*

Hitler *volume 6 page 65*

Third Seminole War (U.S. history, 1855-58)

Seminole *volume 12 page 64*

Thirteen colonies (British and U.S. history): *see in index* American colonies

Thirteenth Amendment (U.S. Constitution)
abolitionist movement *volume 1 page 12*
African Americans *volume 1 page 43*
slavery *volume 12 page 107*

thistle (plant and flower)
MAIN ARTICLE *volume 13 page 60*, picture,
volume 13 page 61

thobe (article of clothing) *picture, volume 11 page 4*

Thocmectony (Native American educator, author and lecturer): *see in index*
Winnemucca, Sarah

tholos (ancient Greek architecture)
temple remains at Delphi *picture, volume 5 page 154*

Thomas Point Lighthouse (lighthouse in Chesapeake Bay, Maryland, U.S.) *picture, volume 7 page 149*

Thomson's gazelle (mammal)
antelope types *picture, volume 1 page 139*

thoracic basket (anatomy): *see in index*
rib cage

thorax (anatomy)
ant *volume 1 page 133*
insect *volume 6 page 138*, *picture, volume 6 page 138*

thorn (botany)
hawthorn *volume 6 page 28*

Thoroughbred (breed of horse)
evolution *picture, volume 4 page 170*
horse *volume 6 page 86*

Thorpe, Jim (U.S. athlete)
MAIN ARTICLE *volume 13 page 61*, *picture, volume 13 page 61*

“Thousand and One Nights, The”
(Middle Eastern tales): *see in index* “Arabian Nights”

Thousand Days, The War of a (Colombian history)
Colombia *volume 3 page 153*

Thrace (ancient region in Europe)
Bulgaria *volume 2 page 149*

Thracian (people)
Sofia *volume 12 page 122*

thread (sewing material)
lace making *picture, volume 7 page 100*

Three Affiliated Tribes (Native American tribal group)
Arikara *volume 1 page 177*
Hidatsa *volume 6 page 53*
Mandan *volume 8 page 40*

three-day measles (disease): *see in index*
rubella

Three Gorges (area in China)
Xiling Gorge *picture, volume 3 page 102*

Three Gorges Dam (dam in China)
Yangtze River *volume 15 page 87*

Three Kingdoms period (Korean history)
North Korea *volume 7 page 80*
South Korea *volume 7 page 83*

“Three Little Pigs, The” (fable) *picture, volume 5 page 4*
fable *volume 5 page 4*

Three Sisters (geological formation in New South Wales, Australia) *picture, volume 9 page 53*

three-toed sloth (mammal) *picture, volume 12 page 108*

throat (anatomy): *see in index* pharynx

throne (furniture)
Nepalese throne *picture, volume 8 page 159*

“Through the Looking-Glass” (work by Carroll)
Carroll *volume 3 page 43*

throughway (road): *see in index* expressway

throwing (athletics)
track and field *volume 13 page 86*

thrush family (birds): *see in index* bluebird; Old World blackbird; robin

thrust (physics)
airplane *volume 1 page 56*

thrust stage (theater)
theater *volume 13 page 57*

thumb (anatomy)
hand *volume 6 page 12*
primate *volume 10 page 148*

thunderstorm (weather)
storm *volume 12 page 191*

Thutmose I (king of Egypt)
Nubia *volume 9 page 103*

Thutmose III (king of Egypt)
ancient Egypt *volume 4 page 114*
Hatshepsut *volume 6 page 24*

thylacine (extinct mammal) *picture, volume 1 page 127*

thymine (chemical compound)
DNA *volume 4 page 61*

thymus (gland)
lymphatic system *volume 7 page 191*,
picture, volume 7 page 189

thyroid gland (anatomy)
endocrine system *volume 4 page 135*,
picture, volume 4 page 135

Tiananmen (gateway in Beijing, China)
Beijing *volume 2 page 50*

Tiananmen Square (square in Beijing, China)
Beijing *volume 2 page 50*

Tiananmen Square incident (Chinese history)
Beijing *volume 2 page 51*

Tian Shan (mountains in Central Asia)
Asia *picture, volume 1 page 202*

Tiantan (temple in Beijing, China): *see in index* Heaven, Temple of

Tiantan Park (park in Beijing, China)
Beijing *volume 2 page 50*

Tiberius (Roman emperor)
ancient Rome *volume 11 page 90*

Tibet (autonomous region in China)
MAIN ARTICLE *volume 13 page 62*

MORE TO EXPLORE
history
Bhutan *volume 2 page 66*
Dalai Lama *volume 4 page 7*
Mount Everest *volume 4 page 167*
Potala Palace *picture, volume 13 page 62*

Tibet, Plateau of (plateau in Asia)
Tibet *volume 13 page 62*

Tibetan Buddhism (religion)
Dalai Lama *volume 4 page 7*, *picture, volume 4 page 7*
Tibet *volume 13 page 62*

Tibeto-Chinese languages: *see in index*
Sino-Tibetan languages

tibia (bone)
knee *volume 7 page 73*
leg *volume 7 page 123*

tick (arachnid)

MAIN ARTICLE *volume 13 page 63, picture, volume 13 page 63*

MORE TO EXPLORE

Lyme disease *volume 7 page 188*

typhus *volume 13 page 124*

Ticonderoga, Fort (fort in New York, U.S.)

capture by Ethan Allen *picture, volume 1 page 83*

tidal wave (giant sea wave): *see in index* tsunami

tide (oceanic movement)

MAIN ARTICLE *volume 13 page 63, picture, volume 13 page 64*

MORE TO EXPLORE

ocean *volume 9 page 117*

Tien Shan (mountain range in Asia): *see in index* Tian Shan

Tierra del Fuego (archipelago in South America)

MAIN ARTICLE *volume 13 page 64*

Tiffany, Louis Comfort (U.S. designer)
glass vase *picture, volume 4 page 25*

tiger (animal)

MAIN ARTICLE *volume 13 page 65, picture, volume 13 page 65*

tiger cat (mammal): *see in index* spotted-tailed native cat

tiger shark

shark *volume 12 page 77*

Tigray (Eritrean people)

Eritrea *volume 4 page 151*

Tigre (Eritrean people)

Eritrea *volume 4 page 151*

Tigris River (river in the Middle East)

MAIN ARTICLE *volume 13 page 66*

MORE TO EXPLORE

Iraq *volume 6 page 151*

Tikriti, Saddam Hussein al- (president of Iraq): *see in index* Saddam Hussein

Tilden, Samuel J. (U.S. politician)

Hayes *volume 6 page 29*

tile (building material)

MAIN ARTICLE *volume 2 page 128, picture, volume 2 page 129*

MORE TO EXPLORE

ceramics *picture, volume 3 page 76*

till (geology): *see in index* glacial till

timber (natural substance): *see in index* wood

timber wolf (mammal): *see in index* gray wolf

timbre (sound)

sound *volume 12 page 135, picture, volume 12 page 135*

Timbuktu (city in Mali)

Songhai empire *volume 12 page 133*

time (physics)

MAIN ARTICLE *volume 13 page 66, picture, volume 13 page 67*

MORE TO EXPLORE

clock *volume 3 page 140*

sundial *volume 12 page 204*

timepiece (timekeeping device): *see in index* clock; watch

time zone

time *volume 13 page 67*

timpani (musical instrument)

percussion instruments *picture, volume 8 page 215*

Timpanogos (lake in Utah, U.S.): *see in index* Great Salt Lake

Timur Lenk (Mongol conqueror)

Mongol Empire *volume 8 page 162*

tin (chemical element)

bronze *volume 2 page 134*

Tionontati (Native American people)

Ontario *volume 9 page 140*

tipi (dwelling): *see in index* tepee

Tippecanoe, battle of (U.S. history)

Harrison *volume 6 page 23*

Tiranë (capital city of Albania)

MAIN ARTICLE *volume 13 page 69, picture, volume 13 page 69*

MORE TO EXPLORE

Albania *volume 1 page 65*

tire

automobile *volume 1 page 236*

Tirthankara (Jainism)

Jainism *volume 7 page 8*

Tishcohan (Delaware chief) *picture, volume 4 page 29*

Tisquantum (American Indian interpreter and guide): *see in index* Squanto

Titan (Greek mythology)

MAIN ARTICLE *volume 13 page 70, picture, volume 13 page 71*

MORE TO EXPLORE

Aphrodite *volume 1 page 148*

Apollo *volume 1 page 150*

Artemis *volume 1 page 191*

Atlas *volume 1 page 222*

Demeter *volume 4 page 34*

Hades *volume 6 page 5*

Hera *volume 6 page 43*

Hermes *volume 6 page 47*

Hestia *volume 6 page 48*

Poseidon *volume 10 page 135*

Prometheus *volume 10 page 155*

Zeus *volume 15 page 104*

Titan (moon of Saturn)

Saturn *volume 12 page 42*

Titania (moon of Uranus)

Uranus *volume 14 page 39*

“Titanic” (British ocean liner)

MAIN ARTICLE *volume 13 page 70, picture, volume 13 page 70*

MORE TO EXPLORE

model used for a movie *picture, volume 8 page 199*

Titano, Mount (mountain in San

Marino) *picture, volume 12*

page 29

Titian (Italian painter)

portrait of young woman *picture, volume 10 page 9*

Titicaca, Lake (lake in South America)

Bolivia *volume 2 page 103*

Peru *volume 10 page 64*

Tito, Josip Broz (president of Yugoslavia)

Yugoslavia *volume 15 page 95*

Titograd (capital city of Montenegro): *see in index* Podgorica

Tituba (West Indian slave)

Salem witch trials *volume 12 page 20*

Tlaxcala (Native American people)

Cortés *volume 3 page 201, picture, volume 3 page 201*

Tlingit (Native American people)

MAIN ARTICLE *volume 13 page 71*

MORE TO EXPLORE

- Native Americans *volume 9 page 18*
 Tlingit traditional clothing *picture, volume 13 page 72*
 totem pole *picture, volume 9 page 18*

toad (amphibian)

MAIN ARTICLE *volume 13 page 72*

MORE TO EXPLORE

- amphibian *volume 1 page 110*
 natterjack toad *picture, volume 13 page 72*
 Oriental fire-bellied toad *picture, volume 13 page 73*
 protective coloration *picture, volume 10 page 157*

“To Anacreon in Heaven” (English drinking song): *see in index* “Star-Spangled Banner, The”

tobacco (plant)

MAIN ARTICLE *volume 13 page 73, picture, volume 13 page 73*

Tobago (island in the West Indies): *see in index* Trinidad and Tobago

“To Be Young, Gifted, and Black” (play by Nemiroff)
 Hansberry *volume 6 page 14*

toddlerhood (growth stage) *picture, volume 3 page 96*
 child development *volume 3 page 97*

toe (anatomy)

foot *volume 5 page 47*

toenail (anatomy): *see in index* nail

Togo (country in Africa)

MAIN ARTICLE *volume 13 page 74, picture, volume 13 page 74*

MORE TO EXPLORE

Lomé *picture, volume 7 page 174*

Togoland (historical colony in Africa): *see in index* Togo

“To His Excellency, General Washington” (poem by Wheatley)
 Wheatley *volume 15 page 40*

Tohono O’odham (Native American people)

MAIN ARTICLE *volume 13 page 75, picture, volume 13 page 75*

MORE TO EXPLORE

Pima *volume 10 page 85*

Tokugawa period (Japanese history)

Tokyo *volume 13 page 76*

Tokugawa shogunate (Japanese history)

Japan *volume 7 page 14*

Tokyo (capital city of Japan)

MAIN ARTICLE *volume 13 page 75, picture, volume 3 page 124*

MORE TO EXPLORE

Japan *volume 7 page 12*
 Shibuya *picture, volume 13 page 76*

Tokyo Stock Exchange

stock exchange *volume 12 page 186*

Toleration Act (1689, England)

Puritan *volume 10 page 169*

Tolkien, J. R. R. (English author)

MAIN ARTICLE *volume 13 page 76, picture, volume 13 page 77*

Toltec (Native American people)

MAIN ARTICLE *volume 13 page 77*

MORE TO EXPLORE

Toltec telamon statues at Tula *picture, volume 13 page 77*

tomato (plant and fruit)

MAIN ARTICLE *volume 13 page 78, picture, volume 13 page 78*

tomb (funerary architecture)

ancient Egypt *picture, volume 4 page 113, picture, volume 6 page 53*
 India *picture, volume 1 page 170*
 Pakistan *picture, volume 10 page 14*
 Petra *picture, volume 7 page 34*
 pyramid *volume 10 page 170*

Tombaugh, Clyde (U.S. astronomer)

Pluto *volume 10 page 102*

Tombs of the Kings, Valley of the

(archaeological site in Egypt): *see in index* Kings, Valley of the

tone (sound)

music *volume 8 page 212*

Tonga (African people)

Zambia *volume 15 page 101*

Tonga (island country in the Pacific Ocean)

MAIN ARTICLE *volume 13 page 79, picture, volume 13 page 79*

MORE TO EXPLORE

Royal Palace *picture, volume 9 page 105*

Tongass National Forest (forest, Alaska, U.S.)

pine trees *picture, volume 10 page 86*

Tongatapu Island (largest island in Tonga)

Nuku’alofa *volume 9 page 105*
 Tonga *volume 13 page 79*

Tonghak (Korean religion): *see in index*

Chondogyo

tongue (anatomy)

MAIN ARTICLE *volume 13 page 80, picture, volume 13 page 80*

MORE TO EXPLORE

frog’s digestive system *picture, volume 4 page 48*
 human digestive system *picture, volume 4 page 47*
 mouth *volume 8 page 197*

Tonkin Gulf Resolution (U.S. policy, 1964): *see in index* Gulf of Tonkin Resolution

tonsillitis (medical disorder)

MAIN ARTICLE *volume 13 page 81, picture, volume 13 page 81*

tonsils (anatomy)

lymphatic system *picture, volume 7 page 189*
 tonsillitis *volume 13 page 81, picture, volume 13 page 81*

Tonto National Forest (forest in Arizona, U.S.) *picture, volume 10 page 75*

tool

culture *volume 3 page 231*
 Iron Age *volume 6 page 159, picture, volume 6 page 158*

tooth (anatomy)

MAIN ARTICLE *volume 13 page 30, picture, volume 13 page 31*

MORE TO EXPLORE

dentistry *volume 4 page 38, picture, volume 4 page 38*
 human digestive system *picture, volume 4 page 47*
 mouth *volume 8 page 197, picture, volume 8 page 197*

tooth decay

dentistry *volume 4 page 38*

toothed whale (mammal)

whale *volume 15 page 36*

tope (Buddhist monument): *see in index*
stupa

Topeka (state capital of Kansas, U.S.)
MAIN ARTICLE *volume 13 page 81, picture,*
volume 13 page 82

MORE TO EXPLORE
Kansas *volume 7 page 47*

Topkapi Palace Museum (museum,
Istanbul, Turkey)
Istanbul *volume 6 page 171*

topographic map (cartography)
geography *volume 5 page 97*
map and globe *volume 8 page 49*

topsoil (geology)
erosion *picture, volume 4 page 152*
soil *volume 12 page 125*

Torah (biblical text)
MAIN ARTICLE *volume 13 page 82, picture,*
volume 13 page 82

MORE TO EXPLORE
Bible *volume 2 page 67*
Judaism *volume 7 page 37*
Moses *volume 8 page 188*
synagogue *volume 12 page 222*

tornado (weather) *picture, volume 12*
page 192
storm *volume 12 page 192*

Toronto (provincial capital of Ontario,
Canada)
Ontario *volume 9 page 139*
outdoor skating rink *picture, volume 9*
page 140
skyscrapers and Lake Ontario *picture,*
volume 9 page 81

Torquemada, Tomás de (Spanish inquisi-
tor)
Inquisition *volume 6 page 137*

Torres Channel (arm of Lake Atlin in
British Columbia, Canada)
Coast Mountains *picture, volume 2*
page 133

tortoise (reptile)
desert tortoise *picture, volume 13*
page 117
shell *volume 12 page 80*

tortoiseshell (cat coloration)
cat *volume 3 page 56*

Tory (U.S. and Canadian history): *see in*
index loyalist

total deafness
deafness *volume 4 page 21*

total eclipse (astronomy)
eclipse *volume 4 page 98*

totalitarianism (form of government)
dictatorship *volume 4 page 46*

totem pole
Tlingit *picture, volume 9 page 18*

Toubkal, Mount (mountain in Morocco)
Morocco *volume 8 page 183*

touch (sense)
senses *volume 12 page 68, picture, vol-*
ume 12 page 68

touchdown (sports)
football *volume 5 page 49*

Tour de France (bicycle race)
Armstrong *volume 1 page 187*
cycling *volume 3 page 234*

Tour Eiffel (tower in Paris, France): *see in*
index Eiffel Tower

touring bicycle (vehicle)
bicycle *volume 2 page 69*

tourism
Africa
Kenya *volume 7 page 59*
Namibia *volume 9 page 7*
Caribbean Sea *volume 3 page 41*
Jamaica *volume 7 page 10, volume 7*
page 68
Europe
Monaco *volume 8 page 158*
Rome *volume 11 page 87*
San Marino *volume 12 page 29*
Switzerland *volume 12 page 219*
Venice *volume 14 page 65*
Indian Ocean
Réunion *volume 11 page 57*
Seychelles *volume 12 page 74*
North America
Lake Superior *volume 12 page 206*
Nevada *volume 9 page 41*
Pennsylvania *volume 10 page 56*
Rocky Mountains *volume 11 page 79*
Sierra Nevada *volume 12 page 86*
South Carolina *volume 12 page 147*
Tennessee *volume 13 page 44*
Utah *volume 14 page 44*
Virginia *volume 14 page 95*
Oceania *volume 9 page 121*
Rio de Janeiro *volume 11 page 67*
Tasmania *picture, volume 13 page 20*

Tbilisi *volume 13 page 24*
Thailand *volume 13 page 55*

tournament (competitive event)
wrestling *picture, volume 15 page 74*

tournament (medieval military games)
picture, volume 7 page 74

tourney (competitive event): *see in index*
tournament

tourney (medieval military games): *see in*
index tournament

Toussaint Louverture (Haitian leader)
MAIN ARTICLE *volume 13 page 83, picture,*
volume 13 page 83

Tower of London (building in London,
United Kingdom): *see in index* London,
Tower of

Townshend, Charles (British chancellor)
American Revolution *volume 1 page 99*

Townshend Acts (British law, 1767)
American Revolution *volume 1 page 99*

toxic chemical: *see in index* poison

toy
MAIN ARTICLE *volume 13 page 83, picture,*
volume 13 page 84
MORE TO EXPLORE
kites *picture, volume 7 page 72*

toy dog (dog group)
dog *volume 4 page 63, table, volume 4*
page 62

“Toy Story” (animated film)
animation *volume 1 page 131, picture,*
volume 1 page 130

trachea (anatomy)
lung *volume 7 page 184, picture, vol-*
ume 7 page 184
respiratory system *volume 11 page 55*

track and field (sports)
MAIN ARTICLE *volume 13 page 84*
MORE TO EXPLORE
hurdling *picture, volume 13 page 86*
Olympic Games *volume 9 page 133*
pole vault *picture, volume 13 page 86*
stopwatch *picture, volume 13 page 67*
track and field events *picture, volume 13*
page 85

track meet (athletics)
track and field *volume 13 page 84*

track race (bicycle race)
cycling *volume 3 page 235*

trade (economics)
MAIN ARTICLE *volume 13 page 87, picture, volume 13 page 87*
MORE TO EXPLORE

boys trading baseball cards *picture, volume 13 page 88*
capitalism *volume 3 page 34*

trade guild (trade association): *see in index guild*

trade limit (economics)
trade *volume 13 page 88*

trader nomad (people): *see in index craftsman-handyman-trader nomad*

trade route (transportation and economics)
Atlantic Ocean *volume 1 page 221*
Red Sea *volume 11 page 37*
trade *volume 13 page 89*

trade unionism: *see in index organized labor*

trade wind (air current)
wind *volume 15 page 48*

trading (economics): *see in index market*

traditional animation (motion pictures)
animation *volume 1 page 130, picture, volume 1 page 130*
cartoon *volume 3 page 50*

tragedy (literature and theater)
drama *volume 4 page 73*
Shakespeare *volume 12 page 75*

T'ai Chi ch'uan (martial art) *picture, volume 8 page 64*
martial arts *volume 8 page 65*

Trail of Tears (U.S. history)
MAIN ARTICLE *volume 13 page 89, picture, volume 13 page 89*

MORE TO EXPLORE
Cherokee *volume 3 page 88*
Jackson *volume 7 page 7*
Native Americans *volume 9 page 19*

train (railway vehicle)
city transportation *picture, volume 13 page 92*
railroad *volume 11 page 20*

trait (biology)
genes and eye color *picture, volume 5 page 94*

genetics *volume 5 page 93*

Trakai Castle (castle in Lithuania) *picture, volume 7 page 165*

trampoline (tumbling equipment)
gymnastics *volume 5 page 175*

Transantarctic Mountains (mountains in Antarctica)
Antarctica *volume 1 page 135*

Transcaucasian Soviet Federated Socialist Republic (historical state in Eurasia)
Armenia *volume 1 page 185*

transcontinental railroad
railroad *volume 11 page 21*

Transylvania (region in Romania): *see in index Transylvania*

transistor (electronics)
computer *volume 3 page 173*
electronics *volume 4 page 123*

Transjordan: *see in index Jordan*

transmigration (religious belief): *see in index reincarnation*

transmission (construction)
automobile *volume 1 page 236, picture, volume 1 page 235*

transmitter (electronics)
radar *volume 11 page 15*
radio *volume 11 page 19*
telegraph *volume 13 page 35*

transplant (surgery)
MAIN ARTICLE *volume 13 page 91*

MORE TO EXPLORE
artificial hip joint *picture, volume 13 page 91*
hepatitis *volume 6 page 42*

transportation
MAIN ARTICLE *volume 13 page 91, picture, volume 13 page 92, picture, volume 13 page 93*

MORE TO EXPLORE
technology and invention *volume 13 page 27*

Transportation, Department of (U.S. government agency)
government executive departments
table, volume 14 page 35

Transylvania (region in Romania)
Romania *volume 11 page 84*

trapeze (circus act equipment): *see in index flying trapeze*

treacle (syrup): *see in index molasses*

treason (crime)
crime *volume 3 page 216*

Treasure State (state in the U.S.): *see in index Montana*

Treasury (tomb at Petra in Jordan) *picture, volume 7 page 34*

Treasury, Department of the (U.S. government agency)
government executive departments
table, volume 14 page 35

Treaty of: *see in index under the specific part of the name, for example, Versailles, Treaty of*

tree (woody plant)
MAIN ARTICLE *volume 13 page 93, picture, volume 13 page 94, picture, volume 13 page 94*

MORE TO EXPLORE
bark *volume 2 page 28, picture, volume 2 page 28*
leaf: *see in index leaf*
mistletoe *picture, volume 10 page 33*
rain forest *picture, volume 11 page 24*
tree conservation replanting *picture, volume 3 page 187*
wind *picture, volume 15 page 48*

tree climbing (locomotion): *see in index climbing*

tree farm
agriculture *volume 1 page 48*

tree fern (plant)
tree *volume 13 page 93*

tree frog (amphibian)
green tree frog *picture, volume 1 page 110*
tree frog in the rain *picture, volume 11 page 21*

tree peony (plant)
peony *volume 10 page 58*

tree sloth (mammal): *see in index sloth*

tree squirrel (rodent)
squirrel *volume 12 page 172*

trembling aspen (tree): *see in index quaking aspen*

trench (marine geology)
ocean *volume 9 page 118*

trench warfare
World War I *volume 15 page 62, picture, volume 15 page 63*

Trent, Council of (Roman Catholicism)
Reformation *volume 11 page 39*

Trenton (state capital of New Jersey, U.S.)

MAIN ARTICLE *volume 13 page 95*

MORE TO EXPLORE

New Jersey *volume 9 page 49*

State House *picture, volume 13 page 95*

Trenton and Princeton, Battles of (U.S. War of Independence)
American Revolution *volume 1 page 101*
Trenton *volume 13 page 95*

Trevi Fountain (fountain in Rome, Italy)
picture, volume 11 page 87

Trevithick, Richard (British engineer)
railroad *volume 11 page 21*
technology and invention *volume 13 page 27*

triangle (mathematics)
geometry *volume 5 page 98*

Triassic period (geochronology)
dinosaur *picture, volume 4 page 53*

tributary (part of river system)
river *volume 11 page 68*

triceps muscle (anatomy)
skeletal muscle *picture, volume 8 page 208*

Triceratops (dinosaur genus)
MAIN ARTICLE *volume 13 page 96, picture, volume 13 page 96*

MORE TO EXPLORE

dinosaur *volume 4 page 51, picture, volume 4 page 53*

trichinosis (disease)
parasite *volume 10 page 33*

trickle irrigation (agriculture): *see in index* drip irrigation

trickster tale (folklore)
folktale *volume 5 page 42*

trident (weapon)
Poseidon *volume 10 page 135, picture, volume 10 page 135*

trigon (mathematics): *see in index* triangle

trilobite (prehistoric marine animal)
prehistoric life *volume 10 page 145*

Trinidad and Tobago (island country in the West Indies)

MAIN ARTICLE *volume 13 page 97*

MORE TO EXPLORE

carnival celebration *picture, volume 13 page 97*

Port of Spain *picture, volume 10 page 132*

Trinity (Christian doctrine)
Christianity *volume 3 page 112*
Saint Patrick's Day *volume 12 page 15*

Trinity College (university in Dublin, Ireland): *see in index* Dublin, University of

Triomphe, Arc de (arch in Paris, France):
see in index Arc de Triomphe

Triple Alliance (European alliance): *see in index* Central Powers

Triple Entente (European alliance): *see in index* Allied Powers

triple jump (athletics)
track and field *volume 13 page 86, picture, volume 13 page 85*

Tripoli (capital city of Libya)
MAIN ARTICLE *volume 13 page 98, picture, volume 13 page 98*

MORE TO EXPLORE

Libya *volume 7 page 144, picture, volume 7 page 144*

Triratna (Buddhism)
Buddhism *volume 2 page 144*

Triton (moon of Neptune)
Neptune *volume 9 page 33*

Trojan War (ancient Greek legend and history)
ancient Greece *volume 5 page 154*
Homer *volume 6 page 76*

trombone (musical instrument)
wind instruments *picture, volume 8 page 217*

Troodon (dinosaur)
dinosaurs in scale *picture, volume 4 page 53*

troop (scouting group)
scouting *volume 12 page 54*

tropical climate
climate *volume 3 page 138*

tropical cyclone (weather)
storm *volume 12 page 192*

tropical easterlies (air current): *see in index* trade wind

tropical forest
forest in Seychelles *picture, volume 5 page 54*

tropical rain forest
biome *volume 2 page 74*
rain forest *volume 11 page 23*
South America *volume 12 page 140*
tropics *volume 13 page 99*

tropical zone (geography): *see in index* tropics

Tropic of Cancer (geography): *see in index* Cancer, Tropic of

Tropic of Capricorn (geography): *see in index* Capricorn, Tropic of

tropics (geography)
MAIN ARTICLE *volume 13 page 98*
MORE TO EXPLORE
desert *volume 4 page 40*
rain forest *picture, volume 11 page 24*

troposphere (atmospheric region)
atmosphere *volume 1 page 223*

trot (animal locomotion)
horse *volume 6 page 86*

trout (fish)
MAIN ARTICLE *volume 13 page 99*
MORE TO EXPLORE
rainbow trout *picture, volume 7 page 103, picture, volume 13 page 99*

Trucial States: *see in index* United Arab Emirates

truck (vehicle)
quarrying *picture, volume 11 page 7*

true buzzard (bird): *see in index* common buzzard

true daisy (flowering plant): *see in index* English daisy

true dolphin (mammal)
dolphin *volume 4 page 64*

true seal (mammal): *see in index* earless seal

true tortoise (reptile): *see in index* tortoise

Truman, Harry S. (president of the U.S.)

MAIN ARTICLE *volume 13 page 100, picture, volume 13 page 100*

MORE TO EXPLORE

timeline *volume 13 page 100*

Truman Doctrine

Truman's presidency *volume 13 page 101*

trumpet (musical instrument)

wind instruments *picture, volume 8 page 217*

trumpeter swan (waterfowl)

swan *volume 12 page 210*

trumpet pitcher plant (plant): *see in index* yellow pitcher plant

trunk (zoology) *picture, volume 9*

page 100
elephant *volume 4 page 124*

truss (architecture)

architecture *volume 1 page 167*

truss bridge (transportation structure)

bridge *volume 2 page 130, picture, volume 2 page 130*

Trusteeship Council (United Nations)

United Nations *volume 14 page 22*

Truth, Sojourner (U.S. evangelist and social reformer)

MAIN ARTICLE *volume 13 page 102, picture, volume 13 page 102*

try (rugby)

rugby *volume 11 page 103*

tsar (Russian ruler)

MAIN ARTICLE *volume 13 page 103*

MORE TO EXPLORE

Lenin *volume 7 page 129*

Russian Revolution *volume 11 page 108*

Tselinograd (capital city of Kazakhstan):

see in index Astana

Tshwane (executive capital city of South Africa): *see in index* Pretoria

Tshwane Metropolitan Municipality

(governing unit of South Africa)
Pretoria *volume 10 page 148*

Tsiolkovsky, Konstantin E. (Russian scientist)

rocket *volume 11 page 77*

tsunami (giant sea wave)

MAIN ARTICLE *volume 13 page 103, picture, volume 13 page 104*

MORE TO EXPLORE

earthquake *volume 4 page 92*

Indonesia *volume 6 page 131*

Lisbon *volume 7 page 159*

Maldives *volume 8 page 30*

Male *volume 8 page 31*

Sri Lanka *volume 12 page 175*

Tsuu T'ina (Native American people): *see in index* Sarcee

Tswana (people)

Botswana *volume 2 page 116*

tuba (musical instrument)

wind instruments *picture, volume 8 page 217*

tube foot (zoology)

starfish *volume 12 page 180*

tuber (part of plant)

vegetable *volume 14 page 61*

tuberculosis (disease)

MAIN ARTICLE *volume 13 page 104, picture, volume 13 page 104*

MORE TO EXPLORE

animal disease *volume 4 page 55*

lung *volume 7 page 184*

tube worm (marine animal) *picture, volume 9 page 118*

Tubman, Harriet (U.S. abolitionist)

MAIN ARTICLE *volume 13 page 105, picture, volume 13 page 105*

MORE TO EXPLORE

African Americans *volume 1 page 43*

Underground Railroad *volume 14 page 9*

Tudor, Henry, earl of Richmond (king of England): *see in index* Henry VII

Tudor, Mary (queen of England): *see in index* Mary I

tug-of-war (athletic contest)

force in action *picture, volume 5 page 50*

Tukulor (people)

Senegal *volume 12 page 67*

Tula (ancient city in Mexico)

Toltec *volume 13 page 77*

tulip (plant and flower)

MAIN ARTICLE *volume 13 page 106, picture, volume 13 page 106*

MORE TO EXPLORE

girl carrying tulips *picture, volume 9 page 39*

tumor (medical disorder)

cancer *volume 3 page 30, picture, volume 3 page 30*

tuna (fish)

MAIN ARTICLE *volume 13 page 106, picture, volume 13 page 107*

tundra (life zone)

MAIN ARTICLE *volume 13 page 107, picture, volume 13 page 107*

MORE TO EXPLORE

biome *volume 2 page 74*

Russia *volume 11 page 104*

taiga *volume 13 page 5*

tundra swan (waterfowl): *see in index* whistling swan

tungsten (chemical element)

Yukon *volume 15 page 97*

tunicate (small marine animal)

bioluminescence *picture, volume 7 page 148*

Tunis (capital city of Tunisia)

MAIN ARTICLE *volume 13 page 108, picture, volume 13 page 108*

MORE TO EXPLORE

Tunisia *volume 13 page 109*

Tunisia (country in Africa)

MAIN ARTICLE *volume 13 page 109*

MORE TO EXPLORE

climate *picture, volume 3 page 138*

Ribat of Harthema, Monastir, Tunisia
picture, volume 13 page 110

Tunis *picture, volume 13 page 108*

tunnel (construction)

mining *volume 8 page 132, picture, volume 8 page 133*

Tupamaro (guerrilla organization in Uruguay)

Uruguay *volume 14 page 43*

turban (headdress)

Sikhism *volume 12 page 88*

turbine engine

internal-combustion engine *volume 6 page 141*

Turk (people)

archery *volume 1 page 166*

Islam *volume 6 page 165*

Turkey *volume 13 page 112*

Turkey (country in Europe and Asia)

MAIN ARTICLE *volume 13 page 111*

MORE TO EXPLORE

agriculture

apricot *volume 1 page 154*

fig *volume 5 page 18*

architecture

Atatürk Mausoleum *picture, volume 1 page 131*

Hagia Sophia *picture, volume 13 page 112*

geography

Asia *volume 1 page 200*

Black Sea *picture, volume 2 page 89*

Middle East *volume 8 page 124*

mountainous area *picture, volume 13 page 111*

history

Cyprus *volume 3 page 236*

Nicosia *volume 9 page 66*

Dardanelles *volume 4 page 16*

Greece *volume 5 page 152*

Kurds *volume 7 page 90*

Ottoman Empire: *see in index* Ottoman Empire

timeline *volume 13 page 111*

turkey (bird)

MAIN ARTICLE *volume 13 page 114*

MORE TO EXPLORE

common turkey *picture, volume 13 page 114*

Turkic peoples (people): *see in index* Turk

Turkish Republic of Northern Cyprus

(political division in Cyprus)

Cyprus *volume 3 page 237*

Turkmen (people)

Turkmenistan *volume 13 page 115*

Turkmenistan (country in Central Asia)

MAIN ARTICLE *volume 13 page 115*

MORE TO EXPLORE

market *picture, volume 13 page 115*

monument in downtown Ashgabat *picture, volume 1 page 199*

Turkoman (people): *see in index* Turkmen

Turner, J. M. W. (English painter)

painting *volume 10 page 10*

Turner, Nat (U.S. slave)

MAIN ARTICLE *volume 13 page 116*

turtle (reptile)

MAIN ARTICLE *volume 13 page 116*

MORE TO EXPLORE

images

desert tortoise *picture, volume 13 page 117*

eastern box turtle *picture, volume 11 page 53*

reptile *volume 11 page 51*

shell *volume 12 page 80*

Tuscarora (Native American people)

MAIN ARTICLE *volume 13 page 117*

MORE TO EXPLORE

Iroquois *volume 6 page 160*

Tuscarora dancer *picture, volume 13 page 117*

Tusitala (British author): *see in index*

Stevenson, Robert Louis

tusk (anatomy)

elephant *volume 4 page 124*

walrus *volume 15 page 6*

Tuskegee Airmen (U.S. military unit)

MAIN ARTICLE *volume 13 page 118, picture, volume 13 page 118*

Tuskegee University (university in

Tuskegee, Alabama, U.S.)

Carver *volume 3 page 51*

Washington *volume 15 page 17*

Tutankhamen (king of Egypt)

MAIN ARTICLE *volume 13 page 119*

MORE TO EXPLORE

ancient Egypt *volume 4 page 113*

gold mask *picture, volume 13 page 119*

pharaoh *volume 10 page 69*

Tutsi (African people)

Burundi *volume 2 page 153*

Kigali *volume 7 page 64*

Rwanda *volume 11 page 110, picture, volume 11 page 110*

Tutu, Desmond (South African archbishop and activist)

MAIN ARTICLE *volume 13 page 120, picture, volume 13 page 120*

Tuvalu (island country in the Pacific Ocean)

MAIN ARTICLE *volume 13 page 121*

MORE TO EXPLORE

traditional hut *picture, volume 13 page 121*

TV (broadcasting): *see in index* television

TVA (U.S. government agency): *see in index* Tennessee Valley Authority

Twa (African people)

Rwanda *volume 11 page 110*

Twain, Mark (U.S. author)

MAIN ARTICLE *volume 13 page 122, picture, volume 13 page 122*

MORE TO EXPLORE

home in Connecticut *picture, volume 3 page 185*

Mississippi River *volume 8 page 143*

“’Twas the Night Before Christmas”

(poem by Moore): *see in index* “Visit from Saint Nicholas, A”

Twelve, The (Christianity): *see in index* Apostles

“Twenty Thousand Leagues Under the Sea” (book by Verne)

Captain Nemo *picture, volume 14 page 70*

Verne *volume 14 page 70*

twin

identical twins *picture, volume 5 page 94*

two-cycle engine: *see in index* two-stroke engine

two-dimensional (art)

painting *volume 10 page 8*

two-party system (politics)

political party *volume 10 page 114*

two-stroke engine

internal-combustion engine *volume 6 page 141*

2000 presidential election (U.S. history)

electoral college *volume 4 page 120*

two-toed anteater (mammal)

anteater *volume 1 page 138*

“Two Towers, The” (work by Tolkien)

Tolkien *volume 13 page 77*

Tyler, John (president of the U.S.)

MAIN ARTICLE *volume 13 page 122, picture, volume 13 page 123*

MORE TO EXPLORE

Harrison *volume 6 page 23*

timeline *volume 13 page 122*

tympanic cavity (anatomy): *see in index* middle ear

tympanic membrane (anatomy): *see in index* eardrum

type (printing): *see in index* movable type

type I diabetes (disease)
diabetes *volume 4 page 43*

type II diabetes (disease)
diabetes *volume 4 page 43*

typhoid fever (disease)
MAIN ARTICLE *volume 13 page 124*

Typhoid Mary (U.S. typhoid carrier)
typhoid fever *volume 13 page 124*

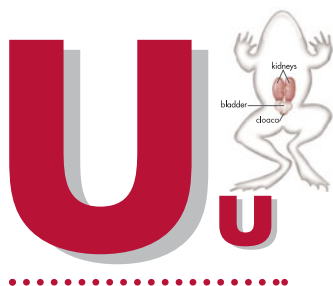
typhoon (tropical storm)
Pacific Ocean *volume 10 page 5*
storm *volume 12 page 192*

typhus (disease)
MAIN ARTICLE *volume 13 page 124*

Tyrannosaurus rex (dinosaur)
MAIN ARTICLE *volume 13 page 125, picture, volume 13 page 125*

MORE TO EXPLORE
dinosaur *volume 4 page 51, picture, volume 4 page 53*

Tyrrhenians (people): *see in index* Etruscans



U.A.E.: *see in index* United Arab Emirates

U.S. Supreme Court: *see in index* United States Supreme Court

UFO: *see in index* unidentified flying object

Uganda (country in Africa)
MAIN ARTICLE *volume 14 page 4, picture, volume 14 page 4, picture, volume 14 page 5*

Ugarte, Augusto Pinochet (president of Chile): *see in index* Pinochet, Augusto

“Ugly Duckling, The” (story by Andersen)
book illustration *picture, volume 1 page 116*

Ukraine (country in Europe)
MAIN ARTICLE *volume 14 page 6, picture, volume 14 page 6, picture, volume 14 page 7*

MORE TO EXPLORE
geography
Church of Saint Andrew *picture, volume 7 page 63*
Yalta *picture, volume 4 page 164*

Ulaanbaatar (capital city of Mongolia)
MAIN ARTICLE *volume 14 page 8, picture, volume 14 page 8*

MORE TO EXPLORE
Mongolia *volume 8 page 163*

Ulaid (former province of Ireland): *see in index* Ulster

ulna (bone)
arm *volume 1 page 182, picture, volume 1 page 182*

Ulster (ancient kingdom in Ireland)
MAIN ARTICLE *volume 14 page 8*
MORE TO EXPLORE

Northern Ireland *volume 9 page 89*

ultraviolet radiation (physics)
radiation *volume 11 page 17*
types of electromagnetic radiation
picture, volume 11 page 18

ultraviolet ray (physics): *see in index* ultraviolet radiation

Uluru/Ayers Rock (rock formation in Northern Territory, Australia) *picture, volume 1 page 13, picture, volume 9 page 91*
Northern Territory *volume 9 page 91*

Uluru-Kata Tjuta National Park (park in Northern Territory, Australia) *picture, volume 1 page 230*

Ulyanov, Vladimir Ilich (leader of the Soviet Union): *see in index* Lenin, Vladimir Ilich

umami (flavor)
tongue *volume 13 page 80*

‘Umar I (Muslim caliph)
Caliphate *volume 3 page 14*

Umayyad Caliphate (Islamic history)
Caliphate *volume 3 page 14*
gold coin *picture, volume 3 page 14*

umbilical cord (embryology)
reproductive system *volume 11 page 49*

umbrella tree
magnolia *volume 8 page 20*

Umbriel (moon of Uranus)
Uranus *volume 14 page 39*

Umhlanga (Swazi ceremony): *see in index* Reed Dance

umpire (sports)
baseball *volume 2 page 31*

UN (international organization): *see in index* United Nations

Unanax (Native American people): *see in index* Aleut

unarmed martial arts
martial arts *volume 8 page 65*

Uncas (Mohegan chief)
Mohegan *volume 8 page 152*

“Uncle Tom’s Cabin” (work by Stowe)
abolitionist movement *volume 1 page 12*
Stowe *volume 12 page 194*

undercoat (feather): *see in index* down

underdeveloped area (economics): *see in index* developing nation

underground cable (electronics)
cable television *picture, volume 13 page 40*

underground political party (politics)
political party *volume 10 page 114*

Underground Railroad (U.S. history)
MAIN ARTICLE *volume 14 page 9, picture, volume 14 page 9*

MORE TO EXPLORE
abolitionist movement *volume 1 page 12*
African Americans *volume 1 page 43*
Douglass *volume 4 page 68*
Fugitive Slave Acts *volume 5 page 74*
Michigan *volume 8 page 117*
Mott *volume 8 page 194*
slavery *volume 12 page 107*
Stowe *volume 12 page 194*
Tubman *volume 13 page 105*

underground train: *see in index* subway

undersea exploration
bathyscaphe *picture, volume 4 page 174*

understory (vegetation)
rain forest *volume 11 page 24, picture, volume 11 page 24*

underwater navigation
navigation *volume 9 page 24*

underworld (Greek mythology)

Demeter and Persephone *volume 4*
page 34

Hades *volume 6* *page 4*

unemployment

Great Depression *picture, volume 5*
page 146

uneven parallel bars (gymnastics)

gymnastics *volume 5* *page 175, picture,*
volume 5 *page 176*

UNHCR (international humanitarian agency): *see in index* United Nations

High Commissioner for Refugees,
Office of the

Uni (Roman goddess): *see in index* Juno**UNIA:** *see in index* Universal Negro Improvement Association**unicorn** (mythical creature)

legendary animals *volume 1* *page 129*
tapestry *picture, volume 1* *page 129*

unidentified flying object

MAIN ARTICLE *volume 14* *page 10, picture,*
volume 14 *page 10*

Union (U.S. history)

American Civil War *volume 1* *page 96*
Reconstruction *volume 11* *page 33*
United States *volume 14* *page 29*

union (labor): *see in index* organized labor**Union, Act of** (Great Britain and Ireland, 1801)

Ireland *volume 6* *page 156*

Union Army (American Civil War)

107th U.S. Colored Infantry *picture,*
volume 1 *page 96*
Delaware *volume 4* *page 31*
Grant *volume 5* *page 137*
Iowa *volume 6* *page 146*
officers in Virginia *picture, volume 1*
page 97

Union Jack (flag of the United Kingdom) *volume 5* *page 30***Union of South Africa** (country in Africa): *see in index* South Africa**Union of Soviet Socialist Republics** (historic country in Eurasia)

MAIN ARTICLE *volume 14* *page 10*

MORE TO EXPLORE

history

Castro *volume 3* *page 55*

Cold War *volume 3* *page 150, picture,*
volume 3 *page 150*

Eisenhower *volume 4* *page 118*

empire *volume 4* *page 132*

Europe *volume 4* *page 164*

Gorbachev *volume 5* *page 128*

Iowa grain sales *volume 6* *page 146*

Korean War *volume 7* *page 85*

Lenin *volume 7* *page 129*

NATO *volume 9* *page 84*

Reagan *volume 11* *page 31*

refugee *volume 11* *page 41*

socialism *volume 12* *page 120*

South Korea *volume 7* *page 84*

Stalin *volume 12* *page 176*

United States *volume 14* *page 31*

Vietnam War *volume 14* *page 86*

World War II *volume 15* *page 65*

people and culture

apartment buildings in Moscow *pic-*
ture, volume 14 *page 12*

May Day *picture, volume 14* *page 14*

patriotic defense poster *picture, vol-*
ume 14 *page 12*

republics and regions of influence

Afghanistan *volume 1* *page 37*

Armenia *volume 1* *page 185*

Azerbaijan *volume 1* *page 239*

Belarus *volume 2* *page 52*

Cuba *volume 3* *page 228*

Czechoslovakia *volume 3* *page 238,*
volume 10 *page 142*

Estonia *volume 4* *page 154, vol-*
ume 13 *page 13*

Georgia *volume 5* *page 103*

Tbilisi *volume 13* *page 24*

Germany *volume 5* *page 107*

Hungary *volume 6* *page 102*

Kazakhstan *volume 7* *page 52*

Kyrgyzstan *volume 7* *page 94*

Bishkek *volume 2* *page 81*

Latvia *volume 7* *page 115*

Lithuania *volume 7* *page 165*

Moldova *volume 8* *page 154*

Mongolia *volume 8* *page 164*

North Korea *volume 7* *page 81*

Poland *volume 10* *page 109*

Romania *volume 11* *page 85*

Russia *volume 11* *page 104*

Tajikistan

Dushanbe *volume 4* *page 84*

Ukraine *volume 14* *page 7*

Kiev *volume 7* *page 64*

science and technology

rocket *volume 11* *page 77*

space exploration *volume 12* *page 151*

unit (measurement)

measurement *volume 8* *page 88*

UNITA (political organization in Angola): *see in index* National Union for the Total Independence of Angola**unitary system** (government)

government *volume 5* *page 133*

unitary system (mathematics): *see in index* tally system**United Arab Emirates** (country in the Middle East)

MAIN ARTICLE *volume 14* *page 15, picture,*
volume 14 *page 15*

MORE TO EXPLORE

Abu Dhabi *picture, volume 1* *page 15*

United Farm Workers (U.S. labor union)

Chavez *volume 3* *page 84*

United Kingdom (island country in Europe)

MAIN ARTICLE *volume 14* *page 16*

MORE TO EXPLORE

flag *volume 5* *page 30*

geography

Buckingham Palace *picture, volume 14*
page 18

Roman Catholic abbey *picture, vol-*
ume 14 *page 18*

village *picture, volume 14* *page 16*

government and law *volume 5* *page 132*

bill of rights *volume 2* *page 70*

constitution *volume 3* *page 190*

impeachment *volume 6* *page 121*

legislature *volume 7* *page 124*

Parliament *volume 10* *page 37*

history

abolitionist movement *volume 1*

page 11, picture, volume 1 *page 11*

ancient Britain: *see in index* Britain

British Empire: *see in index* British
Empire

British Isles

England *volume 4* *page 139*

Ireland *volume 6* *page 155*

Northern Ireland *volume 9* *page 89*

Scotland *volume 12* *page 52*

Stonehenge *picture, volume 12*
page 190

Ulster *volume 14* *page 9*

Cold War *volume 3* *page 150*

North American colonialism

Algonquin people *volume 1* *page 81*

American Revolution *volume 1*
page 98

Chickasaw *volume 3 page 94*
 Creek *volume 3 page 213*
 Declaration of Independence *volume 4 page 23*
 French and Indian War *volume 5 page 66*
 New York City *volume 9 page 60*
 Pontiac *volume 10 page 123*
 United States *volume 14 page 28*
 Vermont *volume 14 page 69*
 War of 1812 *volume 15 page 12*
 Washington *volume 15 page 16*
 Wisconsin *volume 15 page 53*
 radar *volume 11 page 16*
 timeline *volume 14 page 16*
 women's rights *volume 15 page 57, picture, volume 15 page 56*
 World War I *volume 15 page 61*
 recruitment poster *picture, volume 15 page 61*
 World War II *volume 15 page 65*
 London *picture, volume 15 page 66*
 people and culture
 crown of Queen Victoria *picture, volume 7 page 24*
 national anthem *volume 9 page 13*
 soccer *volume 12 page 118*
 tennis *volume 13 page 46*
 track and field *volume 13 page 87*
 Veterans Day *volume 14 page 74*

United Nations (international organization)

MAIN ARTICLE *volume 14 page 22*

MORE TO EXPLORE

bill of rights *volume 2 page 71*
 government *volume 5 page 133*
 human rights *volume 6 page 97*
 Israel *volume 6 page 169*
 League of Nations *volume 7 page 119*
 peacekeeping troops *picture, volume 14 page 22*
 peace movements *volume 10 page 44*
 Persian Gulf War *volume 10 page 62*
 refugee *picture, volume 11 page 41*
 United States
 Bunche *volume 2 page 150*
 New York *volume 9 page 59, picture, volume 3 page 207*
 Roosevelt, Eleanor *volume 11 page 92*
 Roosevelt, Franklin *volume 11 page 93*
 Truman *volume 13 page 101*
 war *volume 15 page 10*

United Nations High Commissioner for Refugees, Office of the (international humanitarian agency)

refugee *volume 11 page 41*

United Nations Security Council: *see in index* Security Council

United Provinces of Central America

(historical federation in Central America)
 Central America *volume 3 page 76*
 Costa Rica *volume 3 page 203*
 El Salvador *volume 4 page 129*
 San Salvador *volume 12 page 30*
 Guatemala *volume 5 page 167*
 Honduras *volume 6 page 77*

United Provinces of the Netherlands

(historical state in Europe): *see in index* Netherlands, United Provinces of the

United Provinces of the Río de la Plata

(historical state in South America): *see in index* Río de la Plata

United Republic of Tanzania (country in Africa): *see in index* Tanzania

United States (country in North America)

MAIN ARTICLE *volume 14 page 24*
 MORE TO EXPLORE

agriculture
 almond *volume 1 page 87*
 drought
 Dust Bowl *volume 4 page 84*
 peach *volume 10 page 45*
 arts
 country music *volume 3 page 208*
 folk music *volume 5 page 41*
 Harlem Renaissance: *see in index* Harlem Renaissance
 popular music *volume 10 page 128*
 rock music *volume 11 page 78*
 economy
 banking *volume 2 page 25*
 Saint Lawrence River and Seaway *volume 12 page 13*
 education *volume 4 page 106*
 flag *volume 5 page 29*
 geography
 Great Lakes *volume 5 page 147*
 Gulf of Mexico *volume 8 page 113*
 hurricane over eastern U.S. *picture, volume 1 page 221*
 Maine harbor *picture, volume 8 page 23*
 Mississippi River *picture, volume 8 page 144, picture, volume 11 page 67*
 Missouri River *picture, volume 8 page 147*

Mount Rainier *picture, volume 15 page 16*

North America *volume 9 page 79*
 oil pipeline in Alaska *picture, volume 14 page 27*

Okefenokee Swamp *picture, volume 14 page 26*

prairie lands *picture, volume 14 page 26*

Tetons and Snake River *picture, volume 15 page 79*

Tonto National Forest *picture, volume 10 page 75*

Yosemite Falls *picture, volume 14 page 24*

government and law *volume 5 page 132*
 census *volume 3 page 71*

congress: *see in index* Congress of the United States

documents

Articles of Confederation *volume 1 page 194*

Bill of Rights *volume 2 page 70*

constitution: *see in index* United States Constitution

Declaration of Independence *volume 4 page 23*

electoral college *volume 4 page 119*
 certificate of vote *picture, volume 4 page 119*

executive branch departments *table, volume 14 page 35*

impeachment *volume 6 page 120*

joint session of Congress *picture, volume 14 page 33*

legislature *volume 7 page 124*

navy *volume 9 page 25*

Peace Corps: *see in index* Peace Corps
 republic *volume 11 page 54*

state government *volume 12 page 181*
 Supreme Court confirmation hearing *picture, volume 14 page 36*

Supreme Court justices *picture, volume 14 page 36*

Washington, D.C. at night *picture, volume 14 page 24*

White House *picture, volume 15 page 41*

Oval Office *picture, volume 14 page 34*

history

ancient cultures and prehistory

Adena culture *volume 1 page 29*

Hohokam culture *volume 6 page 69*

Hopewell culture *volume 6 page 82*

mound builders *volume 8 page 194*

colonial period
 American Revolution *volume 1 page 98*
 Continental Congress *volume 3 page 191*
 minutemen: *see in index* minuteman
 conflicts
 Apache *volume 1 page 144*
 Civil War: *see in index* American Civil War
 Korean War *volume 7 page 85*
 North Korea *volume 7 page 81*
 Persian Gulf War *volume 7 page 91, volume 10 page 62*
 South Korea *volume 7 page 84*
 Spanish-American War *volume 12 page 157*
 Tlingit *volume 13 page 71*
 Vietnam War *volume 14 page 86*
 Hanoi *volume 6 page 13*

For more about U.S. history, look for these articles:

Abolitionist Movement	Kansas-Nebraska Act
Alamo	Korean War
American Civil War	Lewis and Clark Expedition
American Revolution	Liberty Bell
Americas, Exploration and Settlement of the	Liberty, Statue of
Articles of Confederation	Louisiana Purchase
Bill of Rights	<i>Mayflower</i>
Civil Rights Movement	Minuteman
Cold War	Missouri Compromise
Confederate States of America	New Deal
Continental Congress	Oregon Trail
Declaration of Independence	Reconstruction
Dred Scott Decision	Santa Fe Trail
Dust Bowl	Spanish American War
Ellis Island	Trail of Tears
Emancipation Proclamation	Underground Railroad
Great Depression	United States Constitution
	United States Government
	Vietnam War
	War of 1812
	White House
	World War I
	World War II

War of 1812 *volume 15 page 12*
 World War I *volume 15 page 64, picture, volume 15 page 63*
 “Lusitania” *volume 7 page 185*
 World War II *volume 15 page 65, picture, volume 15 page 69, picture, volume 15 page 69*
 discrimination *volume 4 page 54*
 Dust Bowl *picture, volume 4 page 84*
 expansion
 empire *volume 4 page 132*
 Erie Canal *volume 4 page 150*
 Gadsden Purchase *volume 5 page 79*
 Native Americans *volume 9 page 19*
 Great Depression *volume 5 page 146*
 international relations
 Afghanistan *volume 1 page 37, picture, volume 2 page 104*
 Cuba *volume 3 page 228*
 Federated States of Micronesia *volume 8 page 119*
 Haiti *volume 6 page 9*
 Japan *volume 7 page 15*
 Liberia *volume 7 page 139*
 Marshall Islands *volume 8 page 24, volume 8 page 62*
 Mexico *volume 8 page 112*
 Pakistan *volume 10 page 15*
 Palau *volume 10 page 16*
 Panama *volume 10 page 22*
 Panama Canal *volume 10 page 23*
 Philippines *volume 8 page 43, volume 10 page 72*
 Puerto Rico *volume 10 page 165*
 Samoa *volume 12 page 24*
 Saudi Arabia *volume 12 page 45*
 Soviet Union *volume 14 page 14*
 Vila *volume 14 page 90*
 presidency: *see in index* presidency of the United States of America
 post–World War II
 Cold War *volume 3 page 150, picture, volume 3 page 150*
 communism *volume 3 page 168*
 NATO *volume 9 page 84*
 terrorism
 bin Laden *volume 2 page 71*
 people and culture
 African Americans *volume 1 page 43*
 Asian Americans *volume 1 page 206*
 boxing *volume 2 page 119*
 celebration of U.S. Constitution *picture, volume 14 page 29*
 circus *volume 3 page 120*
 Hispanic Americans *volume 6 page 60*

holidays
 Arbor Day *volume 1 page 162*
 Christmas *volume 3 page 115*
 Earth Day *volume 4 page 91*
 Independence Day *volume 6 page 122*
 Memorial Day *volume 8 page 97*
 New Year’s Day *volume 9 page 56*
 Thanksgiving *volume 13 page 56*
 Veterans Day *volume 14 page 74*
 immigration *volume 8 page 128*
 Ellis Island *volume 4 page 127*
 national anthem *volume 9 page 12*
 Native Americans: *see in index* North American Indian
 Ute petroglyph *picture, volume 14 page 46*
 newspapers
 oldest newspaper *volume 6 page 24*
 pioneer life *volume 10 page 88*
 Statue of Liberty *picture, volume 7 page 140*
 wedding custom *picture, volume 3 page 230*
 science and technology
 Internet *volume 6 page 142*
 measurement *volume 8 page 89*
 space exploration *volume 12 page 151*
 telegraph *volume 13 page 35*
 weapon *volume 15 page 26*
 social and environmental issues
 capital punishment *volume 3 page 35*
 civil rights *volume 3 page 128*
 labor *volume 7 page 97*
 slavery
 abolitionist movement *volume 1 page 11*
 Fugitive Slave Acts *volume 5 page 73*
 voting *volume 14 page 105*
 women’s rights *volume 15 page 57*
 equal pay *picture, volume 15 page 57*
 Stanton *volume 12 page 178*

United States, Bank of the (U.S. financial institution)
 Jackson *volume 7 page 6*

United States Air Force, The (military)
 attack on Afghanistan *picture, volume 2 page 104*
 F-16 Fighting Falcons *picture, volume 1 page 52*

United States Army, The (U.S. military)
 picture, *volume 1 page 189*

For more about the United States, look for articles on these U.S. states and their capitals:

<u>STATES</u>	<u>CAPITALS</u>
Alabama	Montgomery
Alaska	Juneau
Arizona	Phoenix
Arkansas	Little Rock
California	Sacramento
Colorado	Denver
Connecticut	Hartford
Delaware	Dover
Florida	Tallahassee
Georgia	Atlanta
Hawaii	Honolulu
Idaho	Boise
Illinois	Springfield
Indiana	Indianapolis
Iowa	Des Moines
Kansas	Topeka
Kentucky	Frankfort
Louisiana	Baton Rouge
Maine	Augusta
Maryland	Annapolis
Massachusetts	Boston
Michigan	Lansing
Minnesota	Saint Paul
Mississippi	Jackson
Missouri	Jefferson City
Montana	Helena
Nebraska	Lincoln
Nevada	Carson City
New Hampshire	Concord
New Jersey	Trenton
New Mexico	Santa Fe
New York	Albany
North Carolina	Raleigh
North Dakota	Bismarck
Ohio	Columbus
Oklahoma	Oklahoma City
Oregon	Salem
Pennsylvania	Harrisburg
Rhode Island	Providence
South Carolina	Columbia
South Dakota	Pierre
Tennessee	Nashville
Texas	Austin
Utah	Salt Lake City
Vermont	Montpelier
Virginia	Richmond
Washington	Olympia
West Virginia	Charleston
Wisconsin	Madison
Wyoming	Cheyenne

United States Bill of Rights (United States Constitution) *picture, volume 2 page 70*
 bill of rights *volume 2 page 70*
 censorship *volume 3 page 70*
 civil rights *volume 3 page 128*
 Henry *volume 6 page 40*
 Rhode Island *volume 11 page 61*
 United States Constitution *volume 14 page 33*

United States Congress: *see in index*
 Congress of the United States

United States Constitution
 MAIN ARTICLE *volume 14 page 32, picture, volume 3 page 189*

MORE TO EXPLORE
 amendment *volume 1 page 93*
 Bill of Rights *volume 2 page 70*
 Articles of Confederation *volume 1 page 195*
 celebration of signing *picture, volume 14 page 29*
 constitution *volume 3 page 189*
 Constitutional Convention *picture, volume 14 page 32*
 electoral college *volume 4 page 120*
 Federalist papers *volume 5 page 9*
 Fugitive Slave Acts *volume 5 page 73*
 important people
 Hamilton *volume 6 page 10*
 Henry *volume 6 page 40*
 Madison *volume 8 page 12*
 New Hampshire *volume 9 page 48*
 newspaper *volume 9 page 55*
 Pennsylvania *volume 10 page 56*
 Rhode Island *volume 11 page 61*
 state government *volume 12 page 181*

United States Forest Service (government agency): *see in index* Forest Service

United States government
 MAIN ARTICLE *volume 14 page 33*

United States Marine Corps, The (U.S. military)
 marines *volume 8 page 56*
 patrol during Vietnam War *picture, volume 14 page 87*
 Sea Knight helicopter *picture, volume 8 page 56*

United States Naval Academy (military academy in Annapolis, Maryland, U.S.)
 Annapolis *volume 1 page 132*

United States Navy, The (U.S. military)
 Cuban missile crisis *picture, volume 3 page 150*
 marines *volume 8 page 56*
 Rhode Island *volume 11 page 61*

United States of America (country in North America): *see in index* United States

United States Open Tennis Championships (tennis)
 Ashe *volume 1 page 199*
 Williams sisters *volume 15 page 45*

United States Postal Service
 state abbreviations *table, volume 1 page 8*

United States Supreme Court
 Dred Scott Decision *volume 4 page 76*
 justices *picture, volume 14 page 36*
 Marshall *volume 8 page 61*
 Roberts confirmation hearing *picture, volume 14 page 36*
 Taft *volume 13 page 5*
 United States government *volume 14 page 36*

United States War of Independence (U.S. history, 1775-83): *see in index* American Revolution

United States Weather Bureau (government agency, U.S.)
 Tyler *volume 13 page 124*

univalve (class of mollusks)
 shell *volume 12 page 80*

Universal Declaration of Human Rights
 Bill of Rights *volume 2 page 71*
 human rights *volume 6 page 97*
 United Nations *volume 14 page 22*

Universal Negro Improvement Association
 Garvey *volume 5 page 91*

universe (astronomy)
 MAIN ARTICLE *volume 14 page 37, picture, volume 14 page 37*
 MORE TO EXPLORE
 Einstein *volume 4 page 116*

university library
 library *volume 7 page 142*

University of: *see in index under the specific part of the name, for example, Dublin, University of*

Unknowns, Tomb of the (memorial in Arlington, Virginia, U.S.)
Memorial Day *volume 8 page 97*

Unknown Soldier, Tomb of the (memorial in Arlington, Virginia, U.S.): *see in index* Unknowns, Tomb of the

untouchable (Hindu social class)
caste *volume 3 page 52*

Upanishad (Hindu literature)
Veda *volume 14 page 60*

updraft (meteorology)
glider *volume 5 page 120*

Upenski Cathedral (cathedral in Helsinki, Finland) *picture, volume 6 page 36*

Upper Canada (historical region in Canada): *see in index* Canada West

upper course (river)
river *volume 11 page 68*

Upper Cretaceous Series (geochronology): *see in index* Late Cretaceous Epoch

Upper Egypt (region of the Nile Valley in Africa)
ancient Egypt *volume 4 page 113*

Upper Olympus (mountain in Greece): *see in index* Olympus, Mount

Upper Peninsula (peninsula in Michigan, U.S.)
Carp River *picture, volume 8 page 117*
Michigan *volume 8 page 116*

Upper Volta (historical French colony in Africa)
Burkina Faso *volume 2 page 151*

Ural Mountains (mountain range in Eurasia)

MAIN ARTICLE *volume 14 page 38*

MORE TO EXPLORE

Asia *volume 1 page 200*

Belaya River *picture, volume 14 page 38*

uranium (chemical element)
Curie family *volume 3 page 232*
Namibia *volume 9 page 7*
nuclear energy *volume 9 page 104, picture, volume 4 page 139*

Uranus (Greek mythology)
Titans *volume 13 page 70*

Uranus (planet)
MAIN ARTICLE *volume 14 page 38, picture, volume 14 page 39*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*

solar system *volume 12 page 127, picture, volume 12 page 127*

Urdu language

Pakistan *volume 10 page 13*

ureter (anatomy)

kidney *volume 7 page 63*

urinary system *volume 14 page 40, picture, volume 14 page 40*

urethra (anatomy)

reproductive system *picture, volume 11 page 47*

urinary system *volume 14 page 40*

urinary system (anatomy and physiology)

MAIN ARTICLE *volume 14 page 40, picture, volume 14 page 40, picture, volume 14 page 41*

MORE TO EXPLORE

kidney *volume 7 page 62*

urination (physiology)

urinary system *volume 14 page 40*

urine (biochemistry)

kidney *volume 7 page 62*

urinary system *volume 14 page 40, picture, volume 14 page 40*

Urquhart Castle (castle in Scotland) *picture, volume 12 page 52*

Uruguay (country in South America)

MAIN ARTICLE *volume 14 page 42*

MORE TO EXPLORE

geography

central Uruguay *picture, volume 14 page 42*

Montevideo *picture, volume 8 page 176*

Punta del Este *picture, volume 14 page 43*

USAF (military): *see in index* United States Air Force, The

U.S. Constitution: *see in index* United States Constitution

USDA (U.S. government): *see in index* Agriculture, Department of

U.S. Department of Health and

Human Services (U.S. government agency): *see in index* Health and Human Services, U.S. Department of

U.S. federalism

state government *volume 12 page 181*

Ushuaia (city in Argentina) *picture, volume 12 page 140*

U.S. Open (tennis): *see in index* United States Open Tennis Championships

U.S.S.R. (historic country in Eurasia): *see in index* Union of Soviet Socialist Republics

Usumbura (city in Burundi): *see in index* Bujumbura

Utah (state in the U.S.)

MAIN ARTICLE *volume 14 page 44*

MORE TO EXPLORE

geography

Bryce Canyon National Park *picture, volume 14 page 45*

Great Salt Lake *picture, volume 14 page 45*

Ute Indians *volume 14 page 46*

Ute (Native American people)

MAIN ARTICLE *volume 14 page 46*

MORE TO EXPLORE

Carson *volume 3 page 45*

Ute rock carvings *picture, volume 14 page 46*

uterine tube (anatomy): *see in index* fallopian tube

uterus (anatomy)

gestation *volume 5 page 108*

reproductive system *volume 11 page 48*
human reproductive system *picture, volume 11 page 47*

‘Uthman ibn ‘Affan (Muslim caliph)
Caliphate *volume 3 page 14*

utility bicycle (vehicle)
bicycle *volume 2 page 69*

utopia (ideal community)
MAIN ARTICLE *volume 14 page 46*

“Utopia” (book by More)
utopia *volume 14 page 46*

uvula (anatomy)

anatomy of mouth *picture, volume 8 page 197*

Uzbek (people)

Tajikistan *volume 13 page 10*

Uzbekistan (country in Central Asia)
MAIN ARTICLE *volume 14 page 47*

MORE TO EXPLORE

geography

- Ichan-Kala *picture, volume 14 page 47*
- Tashkent *picture, volume 13 page 18*
- refugee camp *picture, volume 11 page 39*
- synagogue *picture, volume 12 page 222*
- textile merchants *picture, volume 13 page 53*

**vaccination** (disease prevention)

- flu shots *picture, volume 10 page 164*
- Pasteur *volume 10 page 41*
- public health *volume 10 page 163*

vaccine (preventive medicine)MAIN ARTICLE *volume 14 page 49*

MORE TO EXPLORE

- bacteria *volume 2 page 5*
- influenza *volume 6 page 137*
- measles *volume 8 page 88*
- medical history *volume 8 page 93*
- rubella *volume 11 page 100*
- Salk *volume 12 page 21*
- smallpox *volume 12 page 111, picture, volume 12 page 111*
- virus *volume 14 page 98*

vacuum (physics)MAIN ARTICLE *volume 14 page 49, picture, volume 14 page 50***vacuum bottle** (insulated flask)vacuum *volume 14 page 50***vacuum tube** (electronics)computer *volume 3 page 174***Vaduz** (capital city of Liechtenstein)MAIN ARTICLE *volume 14 page 50*

MORE TO EXPLORE

- Liechtenstein *volume 7 page 147*
- Vaduz Castle *picture, volume 7 page 147, picture, volume 14 page 51*

Vaduz Castle (building in Vaduz, Liechtenstein) *picture, volume 7 page 147, picture, volume 14 page 51*

vagina (anatomy) *picture, volume 11 page 47*

reproductive system *volume 11 page 49***Vaiaku** (village in Tuvalu)Funafuti Atoll *volume 5 page 75***Vail, Alfred** (U.S. scientist)telegraph *volume 13 page 55*

Vajrayana (Buddhism): *see in index* Tantrism

Valahia (historical region in Romania): *see in index* Walachia

Valdivia, Pedro de (Spanish conqueror) Santiago *volume 12 page 34*

valentine (greeting card)Valentine's Day *volume 14 page 51***Valentine, Saint** (Christian martyr)Valentine's Day *volume 14 page 51***Valentine's Day**MAIN ARTICLE *volume 14 page 51*

Valetta (capital city of Malta): *see in index* Valletta

Valhalla (Norse mythology)MAIN ARTICLE *volume 14 page 51*

MORE TO EXPLORE

Odin *volume 9 page 124***Valkyrie** (Norse mythology)Odin *volume 9 page 124*Valhalla *volume 14 page 51***Valletta** (capital city of Malta)MAIN ARTICLE *volume 14 page 52, picture, volume 8 page 34, picture, volume 14 page 52*

MORE TO EXPLORE

Malta *volume 8 page 34***valley** (landform)MAIN ARTICLE *volume 14 page 52, picture, volume 14 page 53, picture, volume 14 page 53*

MORE TO EXPLORE

- erosion *picture, volume 4 page 152*
- Réunion *picture, volume 11 page 56*
- Slovenian town *picture, volume 12 page 110*
- Swiss village *picture, volume 12 page 218*

valley, lily of the (plant): *see in index* lily of the valley

Valley Forge (historic area in Pennsylvania, U.S.)

American Revolution *volume 1 page 101*

Washington and Baron von Steuben at Valley Forge *picture, volume 1 page 101*

Washington *volume 15 page 20*

value-added tax

tax *volume 13 page 21*

vampire bat (mammal)

bat *volume 2 page 39*

Van Buren, Martin (president of the U.S.)

MAIN ARTICLE *volume 14 page 53, picture, volume 14 page 54*

MORE TO EXPLORE

- Harrison *volume 6 page 23*
- timeline *volume 14 page 53*

Vancouver (city in British Columbia, Canada)

MAIN ARTICLE *volume 14 page 55, picture, volume 14 page 55*

MORE TO EXPLORE

British Columbia *volume 2 page 132*

Vancouver, George (British explorer)

British Columbia *volume 2 page 133*
Vancouver *volume 14 page 55*

Van Diemen's Land (island state in Australia): *see in index* Tasmania

van Drebel, Cornelius (Dutch inventor): *see in index* Drebbel, Cornelis

Van Gogh, Vincent (Dutch painter)

MAIN ARTICLE *volume 14 page 56*

MORE TO EXPLORE

- painting *volume 10 page 11*
- "Self-Portrait with Straw Hat" *picture, volume 14 page 56*

vanilla (flavoring)

MAIN ARTICLE *volume 14 page 57, picture, volume 14 page 57*

MORE TO EXPLORE

orchid *volume 9 page 146*

vanillin (chemical)

vanilla *volume 14 page 57*

van Rijn, Rembrandt Harmenszoon

(Dutch artist): *see in index* Rembrandt

Vanuatu (island country in the Pacific Ocean)

MAIN ARTICLE *volume 14 page 58*

Van Wagener, Isabella (U.S. evangelist and social reformer): *see in index* Truth, Sojourner

vapor (gas)
water *volume 15 page 22*

vaporization (phase change): *see in index* evaporation

Varangian (people): *see in index* Viking

Vardon, Harry (British golfer)
golf *volume 5 page 126*

Varna (city in Bulgaria)
boulevard in Varna *picture, volume 2 page 148*

vascular cambium (botany)
root *picture, volume 11 page 96*

vascular plant
plant *volume 10 page 95*

vase (decorative arts)
Chinese porcelain vases *picture, volume 10 page 139*

vassal (feudalism)
feudalism *volume 5 page 14*

VAT (taxation): *see in index* value-added tax

Vatican City (religious city-state in Europe)

MAIN ARTICLE *volume 14 page 59*

MORE TO EXPLORE

country *volume 3 page 207*

facts about Europe *volume 4 page 163*

Italy *volume 6 page 172*

pope *volume 10 page 125, picture, volume 10 page 125*

Roman Catholicism *volume 11 page 82*

Rome *volume 11 page 87*

Vatican Palace (papal residence in Vatican City, Europe)
Vatican City *volume 14 page 59*

vault (architecture)
architecture *volume 1 page 167*

vault (gymnastics)
gymnastics *volume 5 page 174, picture, volume 5 page 175, picture, volume 5 page 176*

VCR (electronic device): *see in index* videocassette recorder

Veda (Hinduism)
MAIN ARTICLE *volume 14 page 60*

MORE TO EXPLORE

Brahma *picture, volume 14 page 60*

Hinduism *volume 6 page 56*

Vedanta (Hindu literature): *see in index* Upanishad

Vedda (people)
Sri Lanka *volume 12 page 175*

Vedic literature (Hinduism): *see in index* Veda

Vedism (Indian religion)
Hinduism *volume 6 page 57*

vegetable (food)
MAIN ARTICLE *volume 14 page 60, picture, volume 14 page 60*

MORE TO EXPLORE

fruit *volume 5 page 72*

vegetable fiber
ancient Egyptian fibers *picture, volume 5 page 16*

vegetarianism
Hinduism *volume 6 page 56*
Jainism *volume 7 page 9*

veil (headdress)
girls in Malaysia *picture, volume 8 page 28*
girls in Somalia *picture, volume 12 page 130*

vein (anatomy)
cardiovascular system *volume 3 page 38, picture, volume 3 page 38*

vein (plant structure)
leaf *volume 7 page 118*

Velásquez, Diego (Spanish conquistador)
Cortés *volume 3 page 201*

Velázquez, Diego (Spanish painter)
MAIN ARTICLE *volume 14 page 61*

veld (grasslands, Africa)
grassland *volume 5 page 143*

vellum (writing material)
book and bookmaking *volume 2 page 109*

Velociraptor (dinosaur)
MAIN ARTICLE *volume 14 page 62, picture, volume 14 page 62*

MORE TO EXPLORE

dinosaurs in scale *picture, volume 4 page 53*

velocity (mechanics)
motion *volume 8 page 192*

velum (anatomy): *see in index* soft palate

Venera (Soviet space probes)
Venus *volume 14 page 67*

Venezia (city in Italy): *see in index* Venice

Venezuela (country in South America)
MAIN ARTICLE *volume 14 page 63*

MORE TO EXPLORE

Bolívar *volume 2 page 101*

flamingos *picture, volume 14 page 64*

geography

Angel Falls *picture, volume 14 page 63*

Caracas *picture, volume 3 page 36*

Venice (city in Italy)
MAIN ARTICLE *volume 14 page 65*

MORE TO EXPLORE

canal *volume 3 page 28, picture, volume 3 page 28*

Crusades *volume 3 page 224*

Grand Canal *picture, volume 14 page 65*

portolan map, *volume 3 page 126*

venom (biochemistry)
cobras *volume 3 page 145*
coral snake *volume 3 page 198*
sea snake *volume 12 page 60*
spider *volume 12 page 164*

Vent, Îles du (island group of the West Indies): *see in index* Windward Islands

ventricle (heart anatomy)
cardiovascular system *volume 3 page 38*
heart *volume 6 page 31, picture, volume 6 page 31*

Ventura (city in California, U.S.)
California missions table, *volume 8 page 140*

venule (anatomy)
cardiovascular system *volume 3 page 39*

Venus (Roman goddess)
Aphrodite *volume 1 page 148*

Venus (planet)
MAIN ARTICLE *volume 14 page 66, picture, volume 14 page 66*

MORE TO EXPLORE

planets *volume 10 page 92, picture, volume 10 page 93*

solar system *volume 12 page 127, picture, volume 12 page 127*

Venus's-flytrap (plant)

MAIN ARTICLE *volume 14 page 67*, *picture*, *volume 14 page 67*

Vermont (state in the U.S.)

MAIN ARTICLE *volume 14 page 68*

MORE TO EXPLORE

Allen *volume 1 page 83*

geography

ski slope *picture*, *volume 14 page 69*

State Capitol *picture*, *volume 8 page 177*

Stowe *picture*, *volume 14 page 68*

vernal equinox (astronomy)

season *volume 12 page 61*, *picture*, *volume 12 page 61*

Verne, Jules (French author)

MAIN ARTICLE *volume 14 page 70*

MORE TO EXPLORE

science fiction *volume 12 page 51*

Verrazzano, Giovanni da (Italian navigator)

MAIN ARTICLE *volume 14 page 70*

MORE TO EXPLORE

New Jersey *volume 9 page 50*

New York *volume 9 page 59*

Verrazzano-Narrows Bridge (bridge in New York City, New York, U.S.)

Verrazzano *volume 14 page 71*

Verrocchio, Andrea del (Italian painter)

Leonardo da Vinci *volume 7 page 132*

Versailles (city in France)

MAIN ARTICLE *volume 14 page 71*

Versailles, Palace of (building and gardens in Versailles, France) *picture*, *volume 14 page 71*

Versailles *volume 14 page 71*

Versailles, Treaty of (1919)

World War I *volume 15 page 65*

vert (sport): *see in index* vertical skateboarding**vertebra** (anatomy)

skeletal system *volume 12 page 97*

vertebral column (anatomy): *see in index* spine**vertebrate** (animal with a backbone)

MAIN ARTICLE *volume 14 page 72*

MORE TO EXPLORE

animal *volume 1 page 125*

brain *volume 2 page 122*

eye *volume 4 page 176*

snake *volume 12 page 112*

vertical skateboarding (sport)

skateboarding *volume 12 page 94*

vertical skating (sport)

roller skating *volume 11 page 81*

vertical stabilizer (aircraft part)

airplane *volume 1 page 55*

Very Large Array (radio telescope in the U.S.) *picture*, *volume 13 page 39***very-low-frequency radiation** (electromagnetic waves)

navigation *volume 9 page 24*

Vesalius, Andreas (Belgian physician)

anatomy *volume 1 page 115*

Renaissance *volume 11 page 46*, *picture*, *volume 11 page 45*

Vespucci, Amerigo (Italian explorer and navigator)

MAIN ARTICLE *volume 14 page 72*, *map*, *volume 14 page 72*

MORE TO EXPLORE

exploration and settlement of the Americas *volume 1 page 102*

Vesuvius, Mount (volcano in Italy)

MAIN ARTICLE *volume 14 page 73*, *picture*, *volume 14 page 73*

MORE TO EXPLORE

Italy *volume 6 page 172*

Pompeii *volume 10 page 120*

volcano *volume 14 page 102*

Veterans Affairs, Department of (U.S.)

government agency

government executive departments *table*, *volume 14 page 35*

Veterans Day (holiday)

MAIN ARTICLE *volume 14 page 74*, *picture*, *volume 14 page 74*

veterinarian *picture*, *volume 4 page 55*

pet *volume 10 page 66*

veterinary medicine *volume 14 page 75*

veterinary medicine (medical science)

MAIN ARTICLE *volume 14 page 75*, *picture*, *volume 14 page 75*, *picture*, *volume 14 page 75*

veto (government action)

United States government *volume 14 page 34*

Vianden Castle (castle in Luxembourg)

picture, *volume 7 page 187*

vibration (physics)

sound *volume 12 page 134*, *picture*, *volume 12 page 134*, *picture*, *volume 12 page 135*

speech *volume 12 page 162*

viburnum (shrub and tree)

MAIN ARTICLE *volume 14 page 76*, *picture*, *volume 14 page 76*

Viceroyalty of la Plata (historical Spanish viceroyalty in South America): *see in index* Río de la Plata**Victor Emmanuel II** (king of Italy)

Italy *volume 6 page 174*

Victoria (state in Australia)

MAIN ARTICLE *volume 14 page 77*, *picture*, *volume 14 page 78*

Victoria (provincial capital of British Columbia, Canada)

British Columbia *volume 2 page 132*

Victoria (region in Hong Kong, China)

Hong Kong *volume 6 page 78*

Victoria (capital city of Seychelles)

MAIN ARTICLE *volume 14 page 79*, *picture*, *volume 14 page 79*

MORE TO EXPLORE

Seychelles *volume 12 page 74*

Victoria, Lake (lake in Africa)

MAIN ARTICLE *volume 14 page 79*, *picture*, *volume 14 page 80*

MORE TO EXPLORE

facts about Africa *volume 1 page 41*

Nile River *volume 9 page 72*

Tanzania *volume 13 page 15*

Victoria, Queen (queen of the United Kingdom)

MAIN ARTICLE *volume 14 page 76*, *picture*, *volume 14 page 76*

MORE TO EXPLORE

crown *picture*, *volume 7 page 24*

Victoria Falls (waterfall in Zambia-Zimbabwe)

Zambia *picture*, *volume 15 page 101*

Victoria Nile (river in Uganda)

Lake Victoria *volume 14 page 79*

video camera (electronics)

television *volume 13 page 40*

videocassette

video recording *volume 14 page 81*

videocassette recorder (electronic device)

video recording *volume 14 page 80*

video game: *see in index* electronic game

video recording

MAIN ARTICLE *volume 14 page 80, picture, volume 14 page 80*

video signal (electronics)

television *volume 13 page 40*

Vienna (capital city of Austria)

MAIN ARTICLE *volume 14 page 81*

MORE TO EXPLORE

Austria *volume 1 page 233*

coffeehouse *picture, volume 14 page 82*

Schönbrunn Palace *picture, volume 14 page 82*

Vientiane (capital city of Laos)

MAIN ARTICLE *volume 14 page 83*

MORE TO EXPLORE

Laos *volume 7 page 107*

That Luang *picture, volume 14 page 83*

Viet Cong (Vietnamese military and political organization)

Vietnam *volume 14 page 85*

Vietnam War *volume 14 page 86*

Viet Minh (Vietnamese Communist organization)

Vietnam *volume 14 page 85, volume 14 page 86*

Vietnam (country in Southeast Asia)

MAIN ARTICLE *volume 14 page 84*

MORE TO EXPLORE

farmers selling fruit *picture, volume 14 page 85*

geography

Asia *volume 1 page 200*

Gulf of Tonkin *picture, volume 14 page 84*

Hanoi *picture, volume 6 page 13*

Mekong River delta *picture, volume 8 page 96*

history

Ho Chi Minh *volume 6 page 66*

Vietnam War *volume 14 page 86*

Vietnam Veterans Memorial (monument, Washington, D.C., U.S.) *picture, volume 14 page 86***Vietnam War** (1954-75)

MAIN ARTICLE *volume 14 page 86*

MORE TO EXPLORE

Cold War influence *volume 3 page 151*

Hanoi *volume 6 page 13*

Ho Chi Minh *volume 6 page 67*

peace movements *volume 10 page 45*

United States *volume 14 page 31*

anti-war protest *picture, volume 14 page 87*

Johnson *volume 7 page 30*

Nixon *volume 9 page 74*

United States Marines in a marsh *picture, volume 14 page 87*

Vietnam Veterans Memorial *picture, volume 14 page 86*

Vietnam *volume 14 page 85*

Viking (people)

MAIN ARTICLE *volume 14 page 88*

MORE TO EXPLORE

burial ship *picture, volume 14 page 89*

conquests and raids

Anglo-Saxons

Alfred the Great *volume 1 page 76*

England

book illustration *picture, volume 14 page 88*

human migration *volume 8 page 127*

Kiev *volume 7 page 63*

Middle Ages *volume 8 page 122*

pirate *volume 10 page 89*

Russia *volume 11 page 106*

United Kingdom *volume 14 page 18*

discovery and exploration

Americas *volume 1 page 102*

Baltic Sea *volume 2 page 17*

Canada *volume 3 page 25*

Eriksson *volume 7 page 125*

Newfoundland and Labrador *volume 9 page 46, picture, volume 9 page 46*

polar exploration *volume 10 page 110*

origins

Denmark *volume 4 page 37*

Norway *volume 9 page 97*

Sweden *volume 12 page 213*

Viking (United States space probe)

Mars *volume 8 page 59*

Vila (capital city of Vanuatu)

MAIN ARTICLE *volume 14 page 89, picture, volume 14 page 90*

MORE TO EXPLORE

Vanuatu *volume 14 page 58*

Villa, Pancho (Mexican revolutionary)

MAIN ARTICLE *volume 14 page 90, picture, volume 14 page 90*

MORE TO EXPLORE

Mexico *volume 8 page 112*

Wilson *volume 15 page 47*

Zapata *volume 15 page 102*

village (rural society)

southern Sudan *picture, volume 12*

page 200

Switzerland *picture, volume 12 page 218*

United Kingdom *picture, volume 14 page 16*

Villa Nueva (town in Costa Rica): *see in index* San José

Villa Real de la Santa Fé de San Francisco de Asis (Spanish colonial city,

now in New Mexico, U.S.): *see in index* Santa Fe

Ville-Marie (settlement in North America): *see in index* Montreal

Vilnius (capital city of Lithuania)

MAIN ARTICLE *volume 14 page 91, picture, volume 14 page 91*

MORE TO EXPLORE

Lithuania *volume 7 page 165*

Vilnius, cathedral of (cathedral in Vilnius, Lithuania) *picture, volume 14 page 91*

vinaigrette (salad dressing)

vinegar *volume 14 page 92*

vinegar (food)

MAIN ARTICLE *volume 14 page 92*

vineyard (agriculture)

Dniester River valley in Moldova *picture, volume 8 page 154*

grape harvest in Italy *picture, volume 6 page 172*

Vinland (historic area in North America)

Eriksson *volume 7 page 126*

violet (plant and flower)

MAIN ARTICLE *volume 14 page 92, picture, volume 14 page 92*

violet ground beetle (insect)

types of beetles *picture, volume 2 page 49*

violin (musical instrument)

stringed instruments *picture, volume 8 page 216*

viper (snake)

MAIN ARTICLE *volume 14 page 93, picture, volume 14 page 93*

MORE TO EXPLORE

snake *volume 12 page 112*

viral meningitis (disease)
meningitis *volume 8 page 99*

Virginia (state in the U.S.)
MAIN ARTICLE *volume 14 page 94*

MORE TO EXPLORE

geography
artisan Colonial Williamsburg *picture, volume 14 page 95*
Richmond houses *picture, volume 11 page 64*
Shenandoah National Park *picture, volume 14 page 94*
history
Lee *volume 7 page 122*
Washington *volume 15 page 19*
West Virginia *volume 15 page 35*

“Virginia” (Confederate ship): *see in index “Merrimack”*

Virginia Company of London (English company)
Jamestown *volume 7 page 11*

Virginia deer (mammal): *see in index white-tailed deer*

Virginia opossum (marsupial)
opossum *volume 9 page 142*

Virgin Mary (mother of Jesus): *see in index Mary*

“Virgin of the Rocks, The” (painting by Leonardo da Vinci)
Leonardo da Vinci *volume 7 page 132*

Virgin Queen, The (queen of England):
see in index Elizabeth I

Virgo (astronomy)
constellation *volume 3 page 188*
zodiac signs *picture, volume 15 page 107*

virion (viral structure)
virus *volume 14 page 97*

Virunga Mountains (mountain range in Central Africa)
MAIN ARTICLE *volume 14 page 97, picture, volume 14 page 97*

virus (infectious agent)
MAIN ARTICLE *volume 14 page 97*

MORE TO EXPLORE

animal disease *volume 4 page 55*
common cold *volume 3 page 149*
encephalitis *volume 4 page 132*

human disease *volume 4 page 56*
immune system *picture, volume 6 page 119*
living thing *picture, volume 7 page 167*
measles *volume 8 page 87*
mumps *volume 8 page 205*
parasite *volume 10 page 32*
polio *volume 10 page 113*
Salk *volume 12 page 21*
smallpox *volume 12 page 111*
tonsillitis *volume 13 page 81*
virus reproduction through cell invasion
picture, volume 14 page 98

Vishnu (Hindu god)
Angkor Wat *volume 1 page 120*
Hinduism *volume 6 page 56*

visible light (physics): *see in index light*

visible radiation (physics): *see in index light*

vision (physiology): *see in index sight*

“Visit from Saint Nicholas, A” (poem by Moore)
Santa Claus *volume 12 page 31*

Visoke (extinct volcano in Central Africa)
Virunga Mountains *volume 14 page 97*

visual arts: *see in index art*

visual display (information recording):
see in index display

visual illusion: *see in index optical illusion*

vitamin (chemical compound)
MAIN ARTICLE *volume 14 page 98*

MORE TO EXPLORE

food and nutrition *volume 5 page 44*

vitamin B complex (chemical compounds)
vitamins *volume 14 page 99*

vitamin C (chemical compound)
food and nutrition *volume 5 page 44*
fruit *volume 5 page 72*
vitamins *volume 14 page 99*

vitamin D (chemical compound)
food and nutrition *volume 5 page 44*
radiation *volume 11 page 17*
vitamins *volume 14 page 99*

vitamin K (chemical compound)
vitamins *volume 14 page 99*

Víti, Crater (crater in Iceland) *picture, volume 6 page 108*

VLA (radio telescope in the U.S.): *see in index Very Large Array*

Vlad III the Impaler (ruler of Walachia)
Bucharest *volume 2 page 141*

VLF (electromagnetic waves): *see in index very-low-frequency radiation*

Vltava River (river in the Czech Republic)
Prague *picture, volume 10 page 142*

vocal cord (anatomy)
speech *volume 12 page 162*

vocal organ (body part): *see in index syringe*

vodou (Haitian religion): *see in index voodoo*

voice box (anatomy): *see in index larynx*

volcanic activity (geology): *see in index volcanism*

volcanic ash
volcano *volume 14 page 99, picture, volume 14 page 100*

volcanic cave (geology): *see in index lava cave*

volcanic dome (geology): *see in index volcanic mountain*

volcanic island (geology): *see in index oceanic island*

volcanic mountain (geology and landform)
mountain *volume 8 page 195*

volcanism (geology): *see in index volcano*

volcano (geology)
MAIN ARTICLE *volume 14 page 99, picture, volume 14 page 99, picture, volume 14 page 100, picture, volume 14 page 101, picture, volume 14 page 102*

MORE TO EXPLORE

geography
Ecuador *picture, volume 4 page 103*
Hawaii *volume 6 page 26, picture, volume 6 page 27*
Iceland *volume 6 page 108*
Mexico *volume 8 page 110*
Pacific Ocean *volume 10 page 4*
Ring of Fire *volume 11 page 66*
Philippines *picture, volume 10 page 72*

Pompeii *volume 10 page 121*
 island *volume 6 page 167*
 lake *volume 7 page 102*
 mountain *volume 8 page 195*

volcanology (branch of geology)
 volcano *volume 14 page 101*

vole (rodent)

MAIN ARTICLE *volume 14 page 102, picture, volume 14 page 102*

Volga River (river in Russia)

MAIN ARTICLE *volume 14 page 103*

MORE TO EXPLORE

country houses *picture, volume 14 page 103*

facts about Europe *volume 4 page 163*
 Russia *volume 11 page 104*

volleyball (sport)

MAIN ARTICLE *volume 14 page 103, picture, volume 14 page 104, picture, volume 14 page 104*

Volta, Lake (lake in Ghana)

Ghana *volume 5 page 110*

volume (measured space)

measurement *volume 8 page 88*

volunteerism

Earth Day *picture, volume 4 page 91*

Volunteer State: *see in index* Tennessee

voodoo (Haitian religion)

Haiti *volume 6 page 8*

Vostock Station (Russian station, Antarctica)

facts about Antarctica *volume 1 page 137*

vote (political process): *see in index* election

voting (politics)

MAIN ARTICLE *volume 14 page 105, picture, volume 14 page 105*

MORE TO EXPLORE

California *picture, volume 7 page 105*
 election fairness *picture, volume 9 page 14*

Voting Rights Act (U.S. legislation, 1965)

civil rights movement *volume 3 page 131*

Johnson *volume 7 page 29*

King *volume 7 page 66*

Voyager (space probes)

Neptune *picture, volume 9 page 33*

Uranus *volume 14 page 39, picture, volume 14 page 39*

vs. (abbreviation)

common abbreviations *table, volume 1 page 8*

Vulcan (Roman god)

Hephaestus *volume 6 page 42*

Vulcanalia (ancient Roman festival)

Hephaestus *volume 6 page 43*

vulcanism (geology): *see in index* volcanism

vulcanology (branch of geology): *see in index* volcanology

vulture (bird)

MAIN ARTICLE *volume 14 page 106, picture, volume 14 page 106*

MORE TO EXPLORE

birds of prey *volume 2 page 80*



Wabanaki (people): *see in index* Abnaki

wader: *see in index* wading bird

wadi (dry streambed)

Sahara *volume 12 page 8*

wading bird

flamingo *volume 5 page 31*

ibis *volume 6 page 106*

Wagadu (historical empire in West Africa): *see in index* Ghana Empire

Wagadugu (capital city of Burkina Faso): *see in index* Ouagadougou

wages (compensation for labor)

economics *volume 4 page 100*

equal pay for women *picture, volume 15 page 57*

Wagner, Richard (German composer)

opera *volume 9 page 142*

Wagner Act (U.S. legislation, 1935): *see in index* National Labor Relations Act

wagon train (North American history)
 Santa Fe Trail *volume 12 page 33*

wahoo elm (tree): *see in index* winged elm

Waialeale, Mount (mountain in Hawaii, U.S.)

rain *volume 11 page 22*

Waikiki (resort area in Honolulu, Hawaii, U.S.) *picture, volume 6 page 79*

Wailing Wall (pilgrimage site in Jerusalem): *see in index* Western Wall

Walachia (historical region in Romania)

Bucharest *volume 2 page 141*

Romania *volume 11 page 85*

Waldseemüller, Martin (German cartographer)

Vespucci *volume 14 page 73*

Wales (part of the United Kingdom)

MAIN ARTICLE *volume 15 page 4, picture, volume 15 page 4*

MORE TO EXPLORE

England *volume 4 page 139*

Northern Ireland *volume 9 page 90*

United Kingdom *volume 14 page 16*

Walesa, Lech (president of Poland)

Poland *volume 10 page 109*

wali (Islam)

saint *volume 12 page 9*

walia ibex (mammal)

Simien Mountains of Ethiopia *picture, volume 4 page 155*

walk (sports)

baseball *volume 2 page 31*

softball *volume 12 page 123*

Walker, Thomas (U.S. public official, explorer, and physician)

Cumberland Gap *volume 3 page 231*

walking (form of locomotion)

city transportation *picture, volume 13 page 92*

toddler *picture, volume 3 page 96*

walkingstick (insect)

MAIN ARTICLE *volume 15 page 5, picture, volume 15 page 5*

MORE TO EXPLORE

insect *volume 6 page 139*

wall (architecture)brick and tile *volume 2 page 128***Wallace, William** (Scottish hero)Scotland *volume 12 page 53***Wallachia** (historical region in Romania):*see in index* Walachia**Walloon** (people)Belgium *volume 2 page 54***wall painting** (painting): *see in index*

mural

wallpaperMorris design *picture, volume 4 page 26***walrus** (mammal)MAIN ARTICLE *volume 15 page 6, picture, volume 15 page 6*

MORE TO EXPLORE

adaptation *picture, volume 1 page 27*Arctic Ocean *picture, volume 1 page 173***Walsh, Donald** (U.S. explorer and scientist)exploration *volume 4 page 174***Walt Disney Concert Hall** (building in Los Angeles, California, U.S.) *picture, volume 7 page 178***Walt Disney World** (amusement park in Orlando, Florida, U.S.)Disney *volume 4 page 58***Wampanoag** (Native American people)MAIN ARTICLE *volume 15 page 6, picture, volume 15 page 7*

MORE TO EXPLORE

King Philip's War *volume 7 page 67*Massasoit *volume 8 page 75, picture, volume 1 page 105*Metacom *volume 8 page 104, picture, volume 8 page 105*Narraganset *volume 9 page 10*Plymouth Colony *volume 10 page 103*Squanto *volume 12 page 170***wapiti** (animal)MAIN ARTICLE *volume 15 page 7, picture, volume 4 page 127, picture, volume 15 page 7*

MORE TO EXPLORE

deer *volume 4 page 26*elk *volume 4 page 127***Wappinger** (Native American people)MAIN ARTICLE *volume 15 page 8***war**MAIN ARTICLE *volume 15 page 8, picture, volume 15 page 9, picture, volume 15 page 10*

MORE TO EXPLORE

famine *volume 5 page 7*prisoners of war *picture, volume 13 page 93*

technology

ambulance *volume 1 page 93*catapult *volume 3 page 59***war, prisoner of** (international law): *see in index* prisoner of war**War Between the States** (U.S. history):*see in index* American Civil War**war crime** (international law)crime *volume 3 page 216*Nuremberg trials *volume 9 page 110***warfare**: *see in index* war**Warhol, Andy** (U.S. artist)MAIN ARTICLE *volume 15 page 11, picture, volume 15 page 11*

MORE TO EXPLORE

painting *volume 10 page 12***warhorse** (mammal)horse *volume 6 page 87***warm-bloodedness** (physiology)mammal *volume 8 page 36***warning coloration** (biology)protective coloration *volume 10 page 157***War of 1812** (British-U.S. history)MAIN ARTICLE *volume 15 page 12*

MORE TO EXPLORE

people

Harrison *volume 6 page 23*Jackson *volume 7 page 5*Key *volume 7 page 60*Madison *volume 8 page 12*Tecumseh *volume 13 page 30*"USS Constitution" warship *picture, volume 15 page 13*White House *volume 15 page 42***warrigal** (wild dog): *see in index* dingo**warrior** (person)ancient wars *picture, volume 15 page 9*Papua New Guinea *picture, volume 10 page 29*Spartan warrior *picture, volume 12 page 160***Warsaw** (capital city of Poland)MAIN ARTICLE *volume 15 page 14, picture, volume 15 page 14*

MORE TO EXPLORE

Poland *volume 10 page 107***Warsaw Ghetto Uprising** (Polish history)Warsaw *volume 15 page 14***Warsaw Pact** (1955-91, European history)Cold War *volume 3 page 150*NATO *volume 9 page 84***warship**navy *volume 9 page 26*ship *volume 12 page 82***War to End All Wars** (1914-18): *see in index* World War I**Washington** (state in the U.S.)MAIN ARTICLE *volume 15 page 15*

MORE TO EXPLORE

Mount Rainier *picture, volume 15 page 16***Washington, Booker T.** (U.S. educator)MAIN ARTICLE *volume 15 page 17, picture, volume 15 page 17*

MORE TO EXPLORE

African Americans *volume 1 page 43*Du Bois *volume 4 page 80***Washington, D.C.** (capital city of the U.S.)MAIN ARTICLE *volume 15 page 18*

MORE TO EXPLORE

Banneker *volume 2 page 26*Maryland *volume 8 page 69*United States *volume 14 page 24*U.S. Capitol *picture, volume 15 page 18*White House *picture, volume 15 page 41***Washington, George** (president of the U.S.)MAIN ARTICLE *volume 15 page 19, picture, volume 15 page 19*

MORE TO EXPLORE

Adams *volume 1 page 23*American Revolution *volume 1 page 100*French and Indian War *volume 5 page 66*Hamilton *volume 6 page 10*Monroe *volume 8 page 171*Pulaski *volume 10 page 166*Ross *volume 11 page 99, picture, volume 11 page 99*timeline *volume 15 page 19*

United States *volume 14 page 29*
 Valley Forge winter camp *picture, volume 1 page 101*
 Washington, D.C. *volume 15 page 18*
 White House *volume 15 page 41*

Washington, March on (U.S. history)
picture, volume 3 page 130
 civil rights movement *volume 3 page 130*
 King *volume 7 page 66*

Washington and Lee University (university in Lexington, Virginia, U.S.)
 Lee *volume 7 page 122*

Washington Monument (in Washington, D.C., U.S.) *picture, volume 14 page 24*

Washington Wizards (U.S. basketball team)
 Jordan *volume 7 page 35*

wasp (insect)
 MAIN ARTICLE *volume 15 page 21, picture, volume 15 page 21*

waste disposal (biology): *see in index excretion*

waste recycling: *see in index recycling*

watch (timekeeping device)
 clock *volume 3 page 140*

water
 MAIN ARTICLE *volume 15 page 22*
 MORE TO EXPLORE
 cave features *picture, volume 3 page 63*
 chalk *volume 3 page 79*
 cholera *picture, volume 3 page 110*
 crystal *volume 3 page 226*
 Earth *volume 4 page 89*
 energy *volume 4 page 137, picture, volume 4 page 139*
 erosion *volume 4 page 152, picture, volume 4 page 152*
 food and nutrition *volume 5 page 44*
 Mars *volume 8 page 59*
 molecule *picture, volume 8 page 155*
 natural resources *picture, volume 9 page 21*
 physical states of water *picture, volume 8 page 78*
 steam *picture, volume 4 page 166*
 seed *volume 12 page 63*
 transportation *volume 13 page 92*

water, ground (water below Earth's surface): *see in index groundwater*

water buffalo (mammal) *picture, volume 2 page 147*
 buffalo *volume 2 page 146*

watercraft (vehicle): *see in index* boat; harbor; ship

water cycle *picture, volume 15 page 23*
 rain *volume 11 page 21*
 water *volume 15 page 23*

waterfall (geology)
 MAIN ARTICLE *volume 15 page 24*
 MORE TO EXPLORE

Angel Falls *picture, volume 14 page 63*
 Havasu Falls *picture, volume 15 page 24*
 Iguazú Falls *picture, volume 12 page 142*
 Niagara Falls *picture, volume 9 page 58*
 Ozark Mountains *picture, volume 1 page 180*
 salmon *picture, volume 12 page 22*
 Screw Auger Falls *picture, volume 1 page 151*

waterfowl (birds)
 duck *volume 4 page 81*
 mandarin duck *picture, volume 4 page 81*

Watergate Scandal (U.S. history)
 Nixon *volume 9 page 75*

water habitat (biology and ecology)
 habitat *volume 6 page 4*

water hemlock (plant)
 hemlock *volume 6 page 38*

water lily (plant and flower)
 MAIN ARTICLE *volume 15 page 24, picture, volume 15 page 25*

watermelon (fruit)
 melon *picture, volume 8 page 97*

water pollution
 Atlantic Ocean *volume 1 page 221*
 Lake Erie *volume 4 page 149*
 oil spill *picture, volume 10 page 118*
 pollution *volume 10 page 118*

watershed (land drained by a river): *see in index* basin

waterspout (architecture)
 gargoyle *volume 5 page 89*

water supply: *see in index* aqueduct

water transportation: *see in index* shipping

water vapor
 cloud *volume 3 page 143*
 dew *volume 4 page 42*
 evaporation and condensation *volume 4 page 166, picture, volume 4 page 166*
 fog *volume 5 page 40*
 rain *volume 11 page 22*
 snow *volume 12 page 115*
 water cycle *picture, volume 15 page 23*

waterway (transportation)
 Kinderdijk *picture, volume 9 page 38*

waterwheel (energy utilization device)
 medieval French book *picture, volume 13 page 26*

Watson, James (U.S. geneticist)
 genetics *volume 5 page 95*

Watson, Thomas Augustus (U.S. industrialist)
 Bell *volume 2 page 58*

Watson-Watt, Robert (British scientist)
 radar *volume 11 page 16*

Watt, James (Scottish inventor)
 Industrial Revolution *volume 6 page 133*
 technology and invention *volume 13 page 27*

Watteau, Jean-Antoine (French painter)
 painting *volume 10 page 10*

wattle (animal anatomy)
 chicken *volume 3 page 95*

wave (water)
 erosion *volume 4 page 152, picture, volume 4 page 152*
 Lake Superior *picture, volume 12 page 206*
 ocean *volume 9 page 117*
 undersea earthquake *picture, volume 13 page 104*

wave (physics)
 light *volume 7 page 148*
 radiation *volume 11 page 16*
 wavelengths *picture, volume 11 page 17*

wavelength (physics)
 color *volume 3 page 155*
 light *volume 7 page 148*
 prism *volume 10 page 153*
 radiation *volume 11 page 17, picture, volume 11 page 17*

- types of electromagnetic radiation
picture, volume 11 page 18
 rainbow *volume 11 page 22*
- Wave Rock** (landform in Australia) *picture, volume 11 page 75*
- Wawat** (ancient settlement, Nubia)
 Nubia *volume 9 page 103*
- wax**
 petroleum *volume 10 page 68*
- wealth** (economics)
 economics *volume 4 page 99*
- weapon** (military technology)
 MAIN ARTICLE *volume 15 page 25, picture, volume 15 page 26, picture, volume 15 page 26*
 MORE TO EXPLORE
 army *volume 1 page 190*
 bow and arrow *picture, volume 1 page 166*
 Iron Age *volume 6 page 159*
 war *volume 15 page 9*
- weasel family** (mammal)
 MAIN ARTICLE *volume 15 page 26, picture, volume 15 page 27*
- weather**
 MAIN ARTICLE *volume 15 page 27*
 MORE TO EXPLORE
 satellite images of Hurricane Katrina
picture, volume 15 page 28
 wind *volume 15 page 48*
- weather balloon** *picture, volume 3 page 137*
- weather station** *picture, volume 12 page 182*
- weaver** (bird)
 nest *picture, volume 9 page 37*
- web** (biology)
 spider *volume 12 page 164, picture, volume 12 page 164*
- Web, The** (information network): *see in index* World Wide Web
- Webb, Matthew** (British athlete)
 swimming *volume 12 page 216*
- webcam** (electronic technology)
 laptop with webcam *picture, volume 6 page 142*
- Web site** (computer science)
 Internet *volume 6 page 142*
- wedding** (ritual)
 cultural variations *picture, volume 3 page 230*
- wedge** (mechanics)
 machine *volume 8 page 6, picture, volume 8 page 6*
- week**
 calendar *volume 3 page 9*
- weeping willow** (tree) *picture, volume 15 page 46*
 willow *volume 15 page 45*
- Wegener, Alfred Lothar** (German scientist)
 continent *volume 3 page 190*
- weight** (measured mass)
 clock *volume 3 page 140*
 gravity *volume 5 page 144*
 measurement *volume 8 page 88*
- weightlessness** (physics)
 gravity *volume 5 page 144*
- Weimaraner** (breed of dog)
 sporting dogs *table, volume 4 page 62*
- Weimar Republic** (German history, 1919-33)
 Germany *volume 5 page 106*
- Weinstein, Garri** (Russian chess player):
see in index Kasparov, Garry
- Weinstein, Harry** (Russian chess player):
see in index Kasparov, Garry
- Weisz, Erik** (U.S. magician): *see in index* Houdini, Harry
- Welch, Laura Lane** (first lady of the U.S.): *see in index* Bush, Laura Welch
- welfare**: *see in index* social welfare program
- Welland Canal** (waterway in Canada)
 Lake Ontario *volume 9 page 141*
- Wellington** (capital city of New Zealand)
 MAIN ARTICLE *volume 15 page 28, picture, volume 15 page 28*
 MORE TO EXPLORE
 New Zealand *volume 9 page 61*
- Wells, H. G.** (British author)
 science fiction *volume 12 page 51*
- Wells-Barnett, Ida Bell** (U.S. journalist and social reformer)
 MAIN ARTICLE *volume 15 page 29, picture, volume 15 page 29*
- wels** (fish)
 catfish *volume 3 page 60*
- Welsh language**
 Wales *volume 15 page 4*
- Welsh terrier** (breed of dog)
 terrier breeds *table, volume 4 page 62*
- Wendat** (Native American people): *see in index* Wyandot
- “We Real Cool”** (poem by Brooks)
 Brooks *volume 2 page 136*
- Wessex** (historical kingdom in the United Kingdom)
 Alfred the Great *volume 1 page 75*
- West, Kanye** (U.S. musician)
 performance in Los Angeles *picture, volume 6 page 59*
- West, the** (region in the U.S.)
 Apache *volume 1 page 144*
 pioneer life *volume 10 page 88*
- West Africa** (region in Africa): *see in index* Western Africa
- West African chimpanzee** (primate) *picture, volume 3 page 100*
- West Antarctica** (region in Antarctica)
 Antarctica *volume 1 page 135*
- West Bank** (region in Palestine)
 Arab-Israeli Wars *volume 1 page 158*
 Bethlehem *volume 2 page 64*
 Palestine *volume 10 page 19*
- West Beirut** (section in Beirut, Lebanon)
 Beirut *volume 2 page 51*
- westerly** (wind)
 wind *volume 15 page 48*
- Western, Fort** (fort in Augusta, Maine, U.S.)
 Augusta *volume 1 page 227*
- Western Africa** (region in Africa)
 mythology *volume 8 page 223*
- Western Australia** (state in Australia)
 MAIN ARTICLE *volume 15 page 30, picture, volume 15 page 30*
- western balsam poplar** (tree)
 poplar *volume 10 page 126*
- western bluebird** (bird) *picture, volume 2 page 93*
- western diamondback rattlesnake** (reptile) *picture, volume 11 page 28*

western Europe (region in Europe)
Europe *volume 4 page 160*

Western Front (World War I)
World War I *volume 15 page 61*

Western Hemisphere (geography)
hemisphere *volume 6 page 37*
Renaissance view, c. 1500 *map, volume 11 page 45*

western larch (tree)
larch *volume 7 page 109*

western lowland gorilla (primate)
apes *picture, volume 1 page 147*
gorilla *volume 5 page 129*

western red cedar (tree)
conifers *picture, volume 3 page 183*

Western Roman Empire (ancient Rome [395 - 476])
ancient Rome *volume 11 page 91*

Western Sahara (region in Africa)
Morocco *volume 8 page 184*

Western Samoa (island country in the Pacific Ocean): *see in index* Samoa

Western Shoshone (Native American people)
Shoshone *volume 12 page 83*

Western Wall (pilgrimage site in Jerusalem)
Jerusalem *volume 7 page 21*
Western Wall and the Dome of the Rock *picture, volume 7 page 21*

West Germany (historical subdivision of Germany): *see in index* Germany, West

West Indian manatee (mammal): *see in index* Caribbean manatee

West Indies (islands of the Caribbean Sea)

MAIN ARTICLE *volume 15 page 31*

MORE TO EXPLORE

Charlotte Amalie *picture, volume 15 page 32*

exploration and settlement of the Americas *volume 1 page 103*

Latin America *volume 7 page 112*

red-billed tropic bird *picture, volume 15 page 32*

West Indies Indian (Native American peoples): *see in index* Middle American Indian

West Indies mahogany (tree)
mahogany *volume 8 page 21*

West Malaysia (region in Malaysia)
Malaysia *volume 8 page 27*

Westmark trilogy (novels by Alexander)
Alexander *volume 1 page 74*

Westminster, Palace of (government building in London, United Kingdom)
clock tower *picture, volume 7 page 175*
Thames River *picture, volume 13 page 56*

Westminster Abbey (church in London, United Kingdom)
London *volume 7 page 175*

West Nile virus (disease)
MAIN ARTICLE *volume 15 page 33*

MORE TO EXPLORE

encephalitis *volume 4 page 133*

West North Central States (region of North America): *see in index* Great Plains

West Virginia (state in the U.S.)
MAIN ARTICLE *volume 15 page 34*

MORE TO EXPLORE

geography

Sandstone Falls *picture, volume 15 page 34*

State Capitol *picture, volume 3 page 83*

glassware *picture, volume 15 page 35*
Virginia *volume 14 page 96*

West Wing (White House offices, Washington, D.C., U.S.)
White House *volume 15 page 41*

wetland

MAIN ARTICLE *volume 15 page 36, picture, volume 15 page 36*

MORE TO EXPLORE

swan building nest *picture, volume 4 page 101*

whale (mammal)

MAIN ARTICLE *volume 15 page 36, picture, volume 15 page 36, picture, volume 15 page 37*

MORE TO EXPLORE

mammals *volume 8 page 35*

nose *volume 9 page 99*

plankton *volume 10 page 94*

whale hunting: *see in index* whaling

whale shark (fish) *picture, volume 5 page 28*
fish *volume 5 page 27*
shark *volume 12 page 76*

whaling

Arctic Ocean *volume 1 page 173*

New Zealand *volume 9 page 62*

wheat (grain)

MAIN ARTICLE *volume 15 page 39*

MORE TO EXPLORE

wheat spikes ready to harvest *picture, volume 15 page 39*

wheat bread (food): *see in index* bread

Wheatley, Phillis (African American poet)

MAIN ARTICLE *volume 15 page 39, picture, volume 15 page 40*

wheel and axle (machine)

machine *volume 8 page 6, picture, volume 8 page 6*

technology and invention *volume 13 page 25*

“Wheelbarrow, Orchard, The” (painting by Pissarro) *picture, volume 10 page 10*

wheelchair (transportation device)

Boston Marathon *picture, volume 8 page 53*

disability *picture, volume 4 page 54*

“Where the Wild Things Are” (work by Sendak)
Sendak *volume 12 page 65, picture, volume 12 page 64*
theatrical performance *picture, volume 4 page 72*

Whig Party (historical U.S. political party)

Fillmore *volume 5 page 20*

Tyler *volume 13 page 123*

whimbrel (bird)

bill structure and eating habits *picture, volume 2 page 77*

whippoorwill (bird)

MAIN ARTICLE *volume 15 page 40, picture, volume 15 page 41*

Whirlpool Galaxy *picture, volume 5 page 81*

Whiskey Rebellion (U.S. history)

Washington *volume 15 page 21*

whistling swan (waterfowl)

swan *volume 12 page 210*

white (color): *see in index* white light

white asparagus (plant)

asparagus *volume 1 page 210*

white blood cell (biology)

blood *volume 2 page 92*, *picture, volume 2 page 92*

circulatory system *picture, volume 7 page 190*

virus *volume 14 page 98*

white cedar (tree): *see in index* false

cypress

Whitehorse (capital city of Yukon, Canada)

Yukon *volume 15 page 97*

White House (presidential mansion in Washington, D.C., U.S.)

MAIN ARTICLE *volume 15 page 41*, *picture, volume 15 page 41*, *picture, volume 15 page 42*

MORE TO EXPLORE

Washington, D.C. *volume 15 page 18*

white ibis (bird) *picture, volume 6*

page 106

feeding in the Okefenokee Swamp *picture, volume 14 page 26*

white light (optics)

color *volume 3 page 156*

laser *volume 7 page 111*

prism *picture, volume 10 page 153*

White Mountains (mountain range in Maine and New Hampshire, U.S.)

New Hampshire *volume 9 page 47*

trees in autumn *picture, volume 9 page 48*

white mustard (plant and condiment)

mustard *volume 8 page 219*

White Nile (river in Sudan, Africa)

Nile River *volume 9 page 72*

white oak (tree subgenus)

oak *volume 9 page 114*, *picture, volume 9 page 114*

White Point Gardens (garden park in Charleston, South Carolina, U.S.): *see in index* Battery, The

white rhinoceros (mammal)

rhinoceros *volume 11 page 59*

white rice (cereal)

rice *volume 11 page 63*

White River (river in Russia): *see in index*

Belaya River

white shark (fish)

shark *volume 12 page 77*

white spruce (tree)

conifers *picture, volume 3 page 183*

white stork (bird)

stork *volume 12 page 191*

white-tailed deer (mammal) *picture, volume 4 page 26*

Whitney, Eli (U.S. inventor and manufacturer)

MAIN ARTICLE *volume 15 page 42*

MORE TO EXPLORE

cotton gin *picture, volume 15 page 43*

Industrial Revolution *volume 6 page 133*

Whitney, Mount (mountain in California, U.S.)

Death Valley *volume 4 page 23*

Sierra Nevada *volume 12 page 86*, *picture, volume 12 page 86*

WHO (United Nations agency): *see in index* World Health Organization

whole number (mathematics)

numbers and number systems *volume 9 page 106*

Wichita (Native American people)

MAIN ARTICLE *volume 15 page 43*

MORE TO EXPLORE

portrait of Esadewar, 1870 *picture, volume 15 page 43*

Wichita (city in Kansas, U.S.)

Arkansas River *picture, volume 7 page 48*

Kansas *volume 7 page 47*

wicket (sports)

cricket *volume 3 page 214*, *picture, volume 3 page 214*

wickiup (Native American dwelling): *see in index* wigwam

Wie, Michelle (U.S. golfer) *picture, volume 5 page 125*

wigwam (Native American dwelling)

Apache *volume 1 page 144*

Delaware *volume 4 page 29*

Fox *volume 5 page 57*

Paiute *volume 10 page 12*

Pequot *volume 10 page 59*

Shawnee *volume 12 page 78*

Wampanoag *volume 15 page 7*

Wappinger *volume 15 page 8*

Winnebago *volume 15 page 50*

wild boar (mammal): *see in index* boar

wild canary (bird): *see in index* American goldfinch

wildcat (mammal): *see in index* bobcat

wildebeest (mammal): *see in index*gnu

Wilder, Laura Ingalls (U.S. author)

MAIN ARTICLE *volume 15 page 44*, *picture, volume 15 page 44*

wilderness area

Yukon in Canada *picture, volume 15 page 98*

Wilderness Road (historic trail in the U.S.)

Boone *volume 2 page 111*

Cumberland Gap *volume 3 page 231*

wildfowl (birds): *see in index* waterfowl

wildlife conservation

wolf *volume 15 page 54*

wild pig (mammal): *see in index* boar

Wild West (historical period and region in the U.S.): *see in index* West, the

Wild West show (popular entertainment)

Cody *volume 3 page 148*

wild yak (mammal)

yak *volume 15 page 84*

William I (king of England)

London *volume 7 page 175*

Norman Conquest *volume 9 page 78*

on horseback in 14th-century book *picture, volume 9 page 78*

William II (emperor of Germany)

Prussia *volume 10 page 162*

William of Normandy (duke of Normandy): *see in index* William I

Williams, Roger (U.S. religious leader)

Massachusetts Bay Colony *volume 8 page 74*

Providence *volume 10 page 160*

Rhode Island *volume 11 page 61*

Williams, Serena (U.S. athlete)

MAIN ARTICLE *volume 15 page 44, picture, volume 15 page 45*

Williams, Tennessee (U.S. playwright)

drama *volume 4 page 74*

Williams, Venus (U.S. athlete)

MAIN ARTICLE *volume 15 page 44, picture, volume 15 page 45*

Williamsburg (city in Virginia, U.S.)

Colonial Williamsburg *picture, volume 14 page 95*

Virginia *volume 14 page 95*

William the Conqueror (king of

England): *see in index* William I

Willis Tower (building in Chicago, Illinois, U.S.)

four of the world's tallest buildings *picture, volume 12 page 104*

willow (tree and shrub)

MAIN ARTICLE *volume 15 page 45, picture, volume 15 page 46*

Wilmette (city in Illinois, U.S.)

Baha'i House of Worship *picture, volume 2 page 7*

Wilson, August (U.S. playwright)

drama *volume 4 page 74*

"The Piano Lesson" *picture, volume 4 page 74*

Wilson, Woodrow (president of the U.S.)

MAIN ARTICLE *volume 15 page 46, picture, volume 15 page 46*

MORE TO EXPLORE

League of Nations *volume 7 page 119*

Roosevelt *volume 11 page 92*

timeline *volume 15 page 46*

World War I *volume 15 page 64*

Wimbledon Championship (tennis)

Ashe *volume 1 page 199*

Williams sisters *volume 15 page 45*

wind (meteorology)

MAIN ARTICLE *volume 15 page 48, picture, volume 15 page 48*

MORE TO EXPLORE

climate *volume 3 page 137*

energy *volume 4 page 137, picture, volume 4 page 139*

erosion *volume 4 page 152, picture, volume 4 page 152*

ocean *volume 9 page 117*

sand dune *volume 12 page 27*

seed *volume 12 page 63*

weather *volume 15 page 27*

Windhoek (capital city of Namibia)

MAIN ARTICLE *volume 15 page 49, picture, volume 15 page 49*

MORE TO EXPLORE

Namibia *volume 9 page 6*

wind instrument (music) *picture, volume 8 page 217*

music *volume 8 page 213*

musical instruments *volume 8 page 216*

orchestral seating arrangement *picture, volume 9 page 145*

windmill (machine)

MAIN ARTICLE *volume 15 page 49, picture, volume 15 page 50*

MORE TO EXPLORE

images

Greece *picture, volume 5 page 152*

medieval illustration *picture, volume 13 page 26*

The Netherlands *picture, volume 9 page 38*

wind *volume 15 page 48*

window (architecture)

light *picture, volume 7 page 149*

windpipe (anatomy): *see in index* trachea

Wind River Shoshone (Native American people)

Shoshone *volume 12 page 83*

Windsor, Prince Edward, Duke of (king of the United Kingdom): *see in index* Edward VIII

windstorm (weather)

storm *volume 12 page 192*

wind system (meteorology): *see in index*

wind

wind turbine (device) *picture, volume 4*

page 137

windmill *volume 15 page 50*

Windward Islands (island group of the

West Indies)

West Indies *volume 15 page 32*

wine (alcoholic beverage)

fermentation *volume 5 page 11*

images

grape harvest in Italy *picture, volume 6 page 172*

Roman Catholic Mass *picture, volume 11 page 82*

Wineland (historic area in North America): *see in index* Vinland

wing (aircraft)

airplane *volume 1 page 53*

wing (animal)

bat *volume 2 page 38*

insect anatomy *picture, volume 6 page 138*

pterodactyl *volume 10 page 163*

winged elm (tree)

elm *volume 4 page 128*

Wingfield, Walter Clopton (British military officer)

tennis *volume 13 page 46*

Winnebago (Native American people)

MAIN ARTICLE *volume 15 page 50*

MORE TO EXPLORE

basket weaving *picture, volume 15 page 50*

Missouri people *volume 8 page 145*

Oto *volume 9 page 155*

Winnemucca, Sarah (Native American educator, author and lecturer)

MAIN ARTICLE *volume 15 page 51, picture, volume 15 page 51*

Winnipeg (provincial capital of Manitoba, Canada)

Manitoba *volume 8 page 44*

winter (season)

season *volume 12 page 61*

winter fishing: *see in index* ice fishing

Winter Olympics

closing ceremony in 2006 *picture, volume 9 page 134*

ice hockey *picture, volume 5 page 161*

skiing *volume 12 page 97*

Winter Palace (palace in Saint Petersburg, Russia)

Saint Petersburg *volume 12 page 16*

winter solstice (astronomy)

season *volume 12 page 61, picture, volume 12 page 61*

winter squash (plant and food)

squash *volume 12 page 171*

Winthrop, John (American colonial governor)
Massachusetts Bay Colony *volume 8*
page 74

wire (metal thread or slender rod)
telephone *volume 13* *page 36*

wireless (communication): *see in index*
radio

wireless computer network
radio *volume 11* *page 19*

wireless telegraph (communications)
Marconi *volume 8* *page 54*
telegraph *volume 13* *page 35*

wire service (journalism): *see in index*
news service

Wisconsin (state in the U.S.)
MAIN ARTICLE *volume 15* *page 52*

MORE TO EXPLORE

cheesemaking *picture, volume 15*
page 53

geography

lake *picture, volume 7* *page 102*

Milwaukee Art Museum *picture, volume 15* *page 53*

State Capitol *picture, volume 8*
page 11

Winnebago *volume 15* *page 50*

Wisconsin Dells (resort area in Wisconsin, U.S.)
Wisconsin *volume 15* *page 53*

wisdom tooth (anatomy)
teeth *volume 13* *page 31*

wisent (mammal): *see in index* European
bison

witan (British advisory body): *see in index*
witenagemot

witch (occultism)
Salem witch trials *volume 12* *page 20*

witchcraft
Salem witch trials *volume 12* *page 20*

witenagemot (British advisory body)
Parliament *volume 10* *page 38*

wizard: *see in index* witchcraft

Wizard of Menlo Park (U.S. inventor):
see in index Edison, Thomas Alva

Woden (Norse god): *see in index* Odin

wolf

MAIN ARTICLE *volume 15* *page 54*, *picture,*
volume 15 *page 54*

“Wolf in Sheep’s Clothing, The” (fable
by Aesop)
fable *volume 5* *page 4*

Wollstonecraft, Mary (English feminist)
women’s rights *volume 15* *page 56*

Wolof (people)
Senegal *volume 12* *page 66*

Wolof Empire (historical West African
empire)
MAIN ARTICLE *volume 15* *page 54*

wolverine (mammal)
MAIN ARTICLE *volume 15* *page 55*, *picture,*
volume 15 *page 55*

woman: *see in index* women

“Woman at Her Toilet, A” (painting by
Titian) *picture, volume 10* *page 9*

woman suffrage (right to vote)
British poster *picture, volume 15* *page 56*
nineteenth amendment *picture, volume 1* *page 94*
Stanton *volume 12* *page 178*
women’s rights *volume 15* *page 57*

womb (anatomy): *see in index* uterus

wombat (mammal)
marsupial *picture, volume 8* *page 63*

women

biology

endocrine system *volume 4* *page 135*

reproductive system *volume 11*

page 48, *picture, volume 11*
page 47

Blackwell *volume 2* *page 89*

cultural views

Hera *volume 6* *page 43*

pirate *volume 10* *page 89*

dress and adornment

clothing *picture, volume 3* *page 141*

cosmetics *volume 3* *page 202*

education *volume 4* *page 106*

government and law

Dahomey *volume 4* *page 5*

human rights *volume 6* *page 97*

Iceland *volume 6* *page 108*

Johnson-Sirleaf *picture, volume 7*
page 139

voting *volume 14* *page 105*

Protestantism *picture, volume 10*
page 157

sports and games

boxing *volume 2* *page 119*

gymnastics *volume 5* *page 175*, *picture,*
volume 5 *page 176*

soccer *volume 12* *page 119*

World War II *picture, volume 15* *page 69*

women’s basketball (sports)
basketball *volume 2* *page 35*

women’s rights (political and social
movement)

MAIN ARTICLE *volume 15* *page 56*

MORE TO EXPLORE

Anthony *volume 1* *page 139*

British poster *picture, volume 15* *page 56*

Grimké sisters *volume 5* *page 161*

Mott *volume 8* *page 193*

protest *picture, volume 15* *page 57*

Stanton *volume 12* *page 178*

Truth *volume 13* *page 102*

Tubman *volume 13* *page 105*

women’s suffrage (right to vote): *see in*
index woman suffrage

“Wonderful Wizard of Oz, The” (work
by Baum)
first edition illustration *picture, volume 7*
page 163, *picture, volume 7* *page 163*

wood (natural substance)
architecture *volume 1* *page 168*
sculpture *volume 12* *page 55*
tree *volume 13* *page 94*

*To learn about some famous
women, look for these articles:*

Adams, Abigail
Addams, Jane
Anthony,
Susan B.
Barton, Clara
Bethune, Mary
McLeod
Blackwell,
Elizabeth
Cleopatra
Earhart, Amelia
Elizabeth I
Frank, Anne
Gandhi, Indira
Joan of Arc
Keller, Helen

Marie
Antoinette
Mott, Lucretia
Nightingale,
Florence
Parks, Rosa
Ride, Sally
Roosevelt,
Eleanor
Ross, Betsy
Stanton,
Elizabeth Cady
Teresa, Mother
Wells-Barnett,
Ida B.

woodblock (art)

print depicting Basho *picture, volume 2 page 33*

woodchuck (rodent): *see in index* groundhog**woodcut** (art): *see in index* woodblock**wood ibis** (bird): *see in index* wood stork**Woodland Cree** (Native American people)

Cree people *volume 3 page 212*

woodland vole (rodent)

vole *volume 14 page 102*

woodpecker (bird)

MAIN ARTICLE *volume 15 page 58, picture, volume 15 page 58*

wood pulp

paper *volume 10 page 27*

Woods, Tiger (U.S. golfer)

MAIN ARTICLE *volume 15 page 59, picture, volume 15 page 59*

MORE TO EXPLORE

golf *volume 5 page 126*

wood sorrel (plant)

shamrock *volume 12 page 76, picture, volume 12 page 76*

wood stork (bird) *picture, volume 12*

page 191

stork *volume 12 page 191*

woodwind (musical instrument) *picture,*

volume 8 page 217

musical instruments *volume 8 page 216*

orchestra *volume 9 page 145*

orchestral seating arrangement *picture, volume 9 page 145*

woodworking

Haida *volume 6 page 6*

wool (fiber)

Australia *volume 1 page 231*

clothing *volume 3 page 142*

woolly mammoth (extinct mammal)

extinct animals *volume 1 page 127*

Worcester (county in Massachusetts, U.S.)

minuteman *volume 8 page 137*

word (language)

language *volume 7 page 105*

worker (insect caste)

ants *volume 1 page 133*

bee *volume 2 page 46, picture, volume 2 page 46*

termite *volume 13 page 48*

worker: *see in index* organized labor**work force** (work): *see in index* labor**workhorse** (mammal)

horse *volume 6 page 87*

working breed (dog group)

dog *volume 4 page 63, table, volume 4 page 62*

working memory (mental function): *see in index* short-term memory**work song** (music)

blues *volume 2 page 95*

Works Progress Administration (U.S. history)

New Deal *volume 9 page 44*

poster *picture, volume 9 page 44*

World (Earth's places): *see in index:*

For places, see in the index under the following geographic regions, or see in the index individual places by name:

Africa; Asia; continent; Europe; North America; Oceania; South America

For world leaders and world history, see the tables below

World Association of Girl Guides and Girl Scouts (international youth organization)

scouting *volume 12 page 54*

World Court (United Nations): *see in index* International Court of Justice**World Cup** (cricket)

cricket *volume 3 page 215*

World Cup (soccer)

Pelé *volume 10 page 50*

soccer *volume 12 page 116*

World Health Organization (United Nations agency)

public health *volume 10 page 164*

world music

MAIN ARTICLE *volume 15 page 60*

MORE TO EXPLORE

popular music *volume 10 page 127*

To learn about some major world leaders, look for these articles:

Alexander the Great	Genghis Khan
Alfred the Great	Gorbachev,
Augustus	Mikhail
Caesar, Julius	Hatshepsut
Castro, Fidel	Henry VIII
Charlemagne	Louis XVI
Chiang Kai-shek	Mandela,
Churchill,	Nelson
Winston	Mao Zedong
Cleopatra	Napoleon
De Gaulle,	Nehru,
Charles	Jawaharlal
Elizabeth I	Nicholas II
Frederick the Great	Peter the Great
Gandhi, Indira	Stalin, Joseph
Gandhi,	Victoria, Queen
Mahatma	Yeltsin, Boris

World Series (baseball championship)

2004 World Series *picture, volume 2 page 30*

baseball *volume 2 page 32*

World Trade Center (building complex in New York City, New York, U.S.)

bin Laden *volume 2 page 71*

New York City *volume 9 page 60*

World War I (1914-18)

MAIN ARTICLE *volume 15 page 61*

MORE TO EXPLORE

British recruitment poster *picture, volume 15 page 61*

places and events

Europe *volume 4 page 164*

France *volume 5 page 60*

Germany *volume 5 page 106*

Greece *volume 5 page 152*

Italy *volume 6 page 174*

"Lusitania" *volume 7 page 185*

Poland *volume 10 page 108*

Russian Revolution *volume 11 page 108*

Serbia *volume 12 page 72*

United Kingdom *volume 14 page 21*

Japan *volume 7 page 15*

Ottoman Empire *volume 9 page 157*

United States *volume 14 page 30*

Hoover *volume 6 page 81*

Wilson *volume 15 page 47*

post-war development

League of Nations *volume 7 page 119*

monarchy *volume 8 page 159*

technology

airplane *volume 1 page 57*

dogfights *picture, volume 15 page 64*

bomb *volume 2 page 105*

war *volume 15 page 9*

trench warfare *picture, volume 15 page 63*

World War II (1939-45)

MAIN ARTICLE *volume 15 page 65*

MORE TO EXPLORE

Allied Powers

France *volume 5 page 60*

meeting at Yalta *picture, volume 15 page 70*

Soviet Union *volume 14 page 13*

Stalin *volume 12 page 176*

*For more about world history,
look for these articles:*

ANCIENT HISTORY

Aegean

Civilization

Byzantine

Empire

Celt

Egypt, Ancient

Empire

Greece, Ancient

Indus Valley

Civilization

Mesopotamia

Persia

Phoenicia

Rome, Ancient

MIDDLE AGES

Caliphate

Crusades

Feudalism

Holy Roman

Empire

Inquisition

Magna Carta

Middle Ages

Mongol Empire

Viking

MODERN HISTORY

American

Revolution

Americas,

Exploration
and Settlement

of the

Apartheid

Cold War

Cultural

Revolution

Enlightenment

French

Revolution

Great

Depression

Holocaust

Industrial

Revolution

League of

Nations

Ottoman

Empire

Reformation

Renaissance

Russian

Revolution

Union of Soviet

Socialist

Republics

United Nations

Vietnam War

World War I

World War II

Ukraine *volume 7 page 64, vol-
ume 14 page 7*

United Kingdom *volume 14 page 21*

Churchill *volume 3 page 117*

London *volume 7 page 176, picture,
volume 15 page 66*

United States *volume 14 page 30*

D-Day *picture, volume 15 page 69*

Eisenhower *volume 4 page 117*

Michigan *volume 8 page 117*

peace movements *volume 10 page 44*

Roosevelt *volume 11 page 93*

Truman *volume 13 page 100*

women factory workers *picture, vol-
ume 15 page 69*

areas of conflict

Algiers *volume 1 page 80*

Germany

Berlin *volume 2 page 62*

Greece *volume 5 page 153*

Kiribati *volume 7 page 71*

North Korea *volume 7 page 81*

Poland *volume 10 page 109*

Warsaw *volume 15 page 14*

South Korea *volume 7 page 84*

Axis Powers

fascism *volume 5 page 8*

Germany *volume 5 page 107*

Hitler *volume 6 page 65*

Nazi Party *volume 9 page 27*

Japan *volume 7 page 15*

bomb *volume 2 page 105*

Hiroshima *volume 6 page 60*

Holocaust *volume 6 page 71*

human rights *volume 6 page 97*

League of Nations *volume 7 page 119*

post-war Europe

Balkan Peninsula *volume 2 page 13*

Cold War *volume 3 page 150*

refugee *volume 11 page 40, picture,
volume 11 page 41*

prisoners of war *picture, volume 13
page 93*

radar *volume 11 page 16*

war *volume 15 page 9*

weapon *volume 15 page 26*

World Wide Web (information network)

Internet *volume 6 page 142*

worm (animal)

MAIN ARTICLE *volume 15 page 71*

MORE TO EXPLORE

parasite *volume 10 page 33*

worship (religion)

Christianity *volume 3 page 113*

church *volume 3 page 117*

Worship, House of (Baha'i temple in Wilmette, Illinois, U.S.) *picture, vol-
ume 2 page 7*

Wotan (Norse god): *see in index* Odin

Wounded Knee (town in South Dakota, U.S.)

MAIN ARTICLE *volume 15 page 72*

MORE TO EXPLORE

South Dakota *volume 12 page 150*

Wounded Knee, Battle of (U.S. history, 1890)

Sioux *volume 12 page 92*

South Dakota *volume 12 page 150*

Wounded Knee, Second Battle of (U.S. history, 1973)

South Dakota *volume 12 page 150*

Wounded Knee *picture, volume 15
page 72*

Wouri River (river in Cameroon)

Cameroon *volume 3 page 22*

woven cloth (textile)

knitting *volume 7 page 75*

Wovoka (Native American prophet)

Wounded Knee *volume 15 page 72*

WPA (U.S. history): *see in index* Works Progress Administration

Wrangell-Saint Elias National Park

(national park in Alaska, U.S.) *picture,
volume 1 page 64*

wrestling (sport)

MAIN ARTICLE *volume 15 page 73, picture,
volume 15 page 73, picture, volume 15
page 74*

Wright, Frank Lloyd (U.S. architect)

MAIN ARTICLE *volume 15 page 75, picture,
volume 15 page 75*

MORE TO EXPLORE

architecture *volume 1 page 171*

Wright, Orville (U.S. aviator)

MAIN ARTICLE *volume 15 page 75, picture,
volume 15 page 75, picture, volume 15
page 76*

Wright, Wilbur (U.S. aviator)

MAIN ARTICLE *volume 15 page 75, picture,
volume 15 page 75*

To learn about world capitals, look for these articles:

<u>COUNTRIES</u>	<u>CAPITALS</u>	<u>COUNTRIES</u>	<u>CAPITALS</u>	<u>COUNTRIES</u>	<u>CAPITALS</u>
Afghanistan	Kabul	Cape Verde	Praia	Georgia	Tbilisi
Albania	Tiranë	Central African Republic	Bangui	Germany	Berlin
Algeria	Algiers	Chad	N'Djamena	Ghana	Accra
Andorra	Andorra la Vella	Chile	Santiago	Greece	Athens
Angola	Luanda	China	Beijing	Grenada	Saint George's
Antigua and Barbuda	Saint John's	Colombia	Bogotá	Guatemala	Guatemala City
Argentina	Buenos Aires	Comoros	Moroni	Guinea	Conakry
Armenia	Yerevan	Congo, Democratic Republic of the	Kinshasa	Guinea-Bissau	Bissau
Australia	Canberra	Congo, Republic of the	Brazzaville	Guyana	Georgetown
Austria	Vienna	Costa Rica	San José	Haiti	Port-au-Prince
Azerbaijan	Baku	Côte d'Ivoire	Yamoussoukro (official)	Honduras	Tegucigalpa
Bahamas, The	Nassau		Abidjan	Hungary	Budapest
Bahrain	Manama	Croatia	Zagreb	Iceland	Reykjavik
Bangladesh	Dhaka	Cuba	Havana	India	New Delhi
Barbados	Bridgetown	Cyprus	Nicosia	Indonesia	Jakarta
Belarus	Minsk	Czech Republic	Prague	Iran	Tehran
Belgium	Brussels	Denmark	Copenhagen	Iraq	Baghdad
Belize	Belmopan	Djibouti	Djibouti	Ireland	Dublin
Benin	Porto-Novo	Dominica	Roseau	Israel	Jerusalem (claimed by Israel)
Bhutan	Thimphu	Dominican Republic	Santo Domingo	Italy	Rome
Bolivia	La Paz (administrative) Sucre (judicial)	East Timor	Dili	Jamaica	Kingston
Bosnia and Herzegovina	Sarajevo	Ecuador	Quito	Japan	Tokyo
Botswana	Gaborone	Egypt	Cairo	Jordan	Amman
Brazil	Brasília	El Salvador	San Salvador	Kazakhstan	Astana
Brunei	Bandar Seri Begawan	Equatorial Guinea	Malabo	Kenya	Nairobi
Bulgaria	Sofia	Eritrea	Asmara	Kiribati	Bairiki
Burkina Faso	Ouagadougou	Estonia	Tallinn	Korea, North	Pyongyang
Burundi	Bujumbura	Ethiopia	Addis Ababa	Korea, South	Seoul
Cambodia	Phnom Penh	Fiji	Suva	Kuwait	Kuwait City
Cameroon	Yaoundé	Finland	Helsinki	Kyrgyzstan	Bishkek
Canada	Ottawa	France	Paris	Laos	Vientiane
		Gabon	Libreville	Latvia	Riga
		Gambia, The	Banjul	Lebanon	Beirut
				Lesotho	Maseru
				Liberia	Monrovia

Wright brothers (U.S. aviators)
airplane *volume 1 page 57*

Wright Company (U.S. company)
Wright brothers *volume 15 page 76*

Wright Exhibition Company (U.S. company)
Wright brothers *volume 15 page 76*

“Wrinkle in Time, A” (book by L'Engle)
L'Engle *volume 7 page 128*

writer: *see in index* literature

writing

MAIN ARTICLE *volume 15 page 76*, picture, *volume 15 page 78*

MORE TO EXPLORE

forms

alphabet *volume 1 page 88*

cuneiform picture, *volume 15 page 77*

history

ancient Egypt *volume 4 page 113*

communication *volume 3 page 167*

drawing *volume 4 page 75*

language *volume 7 page 104*

Writings (biblical text)
Bible *volume 2 page 67*

writing system: *see in index* writing

WWW (information network): *see in index* World Wide Web

Wyandot (Native American people)
MAIN ARTICLE *volume 15 page 78*

MORE TO EXPLORE

Champlain *volume 3 page 81*

Ontario *volume 9 page 140*

Quebec *volume 11 page 9*

To learn more about world capitals, look for these articles (continued):

<u>COUNTRIES</u>	<u>CAPITALS</u>	<u>COUNTRIES</u>	<u>CAPITALS</u>	<u>COUNTRIES</u>	<u>CAPITALS</u>
Libya	Tripoli	Pakistan	Islamabad	Spain	Madrid
Liechtenstein	Vaduz	Palau	Melekeok	Sri Lanka	Colombo
Lithuania	Vilnius	Panama	Panama City	Sudan	Khartoum
Luxembourg	Luxembourg	Papua New Guinea	Port Moresby	Suriname	Paramaribo
Macedonia	Skopje	Paraguay	Asunción	Swaziland	Mbabane
Madagascar	Antananarivo	Peru	Lima	Sweden	Stockholm
Malawi	Lilongwe	Philippines	Manila	Switzerland	Bern
Malaysia	Kuala Lumpur	Poland	Warsaw	Syria	Damascus
Maldives	Male	Portugal	Lisbon	Tajikistan	Dushanbe
Mali	Bamako	Qatar	Doha	Tanzania	Dar es Salaam
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Mauritania	Nouakchott	Rwanda	Kigali	Tonga	Nuku'alofa
Mauritius	Port Louis	Saint Kitts and Nevis	Basseterre	Trinidad and Tobago	Port of Spain
Mexico	Mexico City	Saint Lucia	Castries	Tunisia	Tunis
Micronesia, Federated States of	Palikir	Saint Vincent and the Grenadines	Kingstown	Turkey	Ankara
Moldova	Chisinau	Samoa	Apia	Turkmenistan	Ashgabat
Monaco	[none]	San Marino	San Marino	Tuvalu	Funafuti Atoll
Mongolia	Ulaanbaatar	São Tomé and Príncipe	São Tomé	Uganda	Kampala
Montenegro	Podgorica (administrative)	Saudi Arabia	Riyadh	Ukraine	Kiev
Morocco	Rabat	Senegal	Dakar	United Arab Emirates	Abu Dhabi
Mozambique	Maputo	Serbia	Belgrade	United Kingdom	London
Myanmar (Burma)	Yangon	Seychelles	Victoria	United States	Washington, D.C.
Namibia	Windhoek	Sierra Leone	Freetown	Uruguay	Montevideo
Nauru	Yaren administrative center	Singapore	Singapore	Uzbekistan	Tashkent
Nepal	Kathmandu	Slovakia	Bratislava	Vanuatu	Vila
Netherlands, The	Amsterdam	Slovenia	Ljubljana	Venezuela	Caracas
New Zealand	Wellington	Solomon Islands	Honiara	Vietnam	Hanoi
Nicaragua	Managua	Somalia	Mogadishu	Yemen	Sanaa
Niger	Niamey	South Africa	Pretoria (administrative)	Zambia	Lusaka
Nigeria	Abuja		Cape Town (legislative)	Zimbabwe	Harare
Norway	Oslo		Bloemfontein (judicial)		
Oman	Muscat				

Wyandot building interior *picture, volume 15 page 78*

Wych elm (tree)
elm *volume 4 page 128*

Wyman, Jane (U.S. actress)
MAIN ARTICLE *volume 11 page 32*

Wynette, Tammy (U.S. singer)
country music *volume 3 page 208*

Wynns, Nellie Tayloe (governor of Wyoming): *see in index* Ross, Nellie Tayloe

Wyoming (state in the U.S.)
MAIN ARTICLE *volume 15 page 79*

MORE TO EXPLORE
geography
Grand Teton National Park *picture, volume 15 page 79*
rodeo in Cody *picture, volume 15 page 80*
State Capitol *picture, volume 3 page 91*



X chromosome (biology)
gender determination *picture, volume 5 page 93*
genetics *volume 5 page 93*

X Games
skateboarding *volume 12 page 94*

Xi'an (city in China)
old city wall *picture, volume 3 page 103*

Xiling Gorge (gorge in China) *picture, volume 3 page 102*

Xochimilco (town near Mexico City, Mexico)
Mexico City *volume 8 page 114*

xocoatl (beverage)
chocolate *volume 3 page 109*

Xolotlán (lake in Nicaragua): *see in index* Managua, Lake

X-ray (radiation beam)
MAIN ARTICLE *volume 15 page 82*
MORE TO EXPLORE

dentistry *volume 4 page 38*
images
human foot *picture, volume 15 page 82*
infected lung *picture, volume 10 page 103*
security workers at an airport *picture, volume 15 page 82*
surgeons examining patient X-rays *picture, volume 8 page 93*
types of electromagnetic radiation *picture, volume 11 page 18*
radiation *volume 11 page 17*

Xunantunich ruins (Mayan ruins in Belize) *picture, volume 2 page 57*

xylophone (musical instrument)
children learning about music *picture, volume 8 page 213*
percussion instruments *picture, volume 8 page 215*



yachting (boating): *see in index* sailing

Yafa (city in Israel): *see in index* Tel Aviv-Yafo

Yafa (ancient city in the Middle East): *see in index* Jaffa

Yahooskin Band (Native American people)
Klamath and Modoc *volume 7 page 73*

yak (mammal)
MAIN ARTICLE *volume 15 page 84, picture, volume 15 page 84*

Yakama (Native American people)
MAIN ARTICLE *volume 15 page 84*
MORE TO EXPLORE
Yakama tepee *picture, volume 15 page 85*

Yale University (university in New Haven, Connecticut, U.S.)
Connecticut *volume 3 page 185*

Yalta (resort city in the Ukraine) *picture, volume 3 page 217*
Swallow's Nest Castle *picture, volume 4 page 164*
World War II meeting *picture, volume 15 page 70*

Yamoussoukro (capital city of Côte d'Ivoire)
MAIN ARTICLE *volume 15 page 85, picture, volume 15 page 85*
MORE TO EXPLORE
Côte d'Ivoire *volume 3 page 204*

Yamoussoukro Basilica (church in Yamoussoukro, Côte d'Ivoire): *see in index* Our Lady of Peace, Basilica of

Yangon (city in Myanmar)
MAIN ARTICLE *volume 15 page 86*
MORE TO EXPLORE
Myanmar *volume 8 page 221*
Sule Pagoda *picture, volume 15 page 86*

Yangtze River (river in China)
MAIN ARTICLE *volume 15 page 86, picture, volume 15 page 87*

MORE TO EXPLORE
facts about Asia *volume 1 page 205*
Xiling Gorge *picture, volume 3 page 102*

Yankton (Native American people): *see in index* Nakota

Yanktonai Dakota (Native American people): *see in index* Nakota

Yaoundé (capital city of Cameroon)
MAIN ARTICLE *volume 15 page 87, picture, volume 15 page 88*
MORE TO EXPLORE
Cameroon *volume 3 page 22*

Yaqui (Native American people)
MAIN ARTICLE *volume 15 page 88*
MORE TO EXPLORE
Yaqui girl from 1907 *picture, volume 15 page 88*

Yaren (capital district of Nauru)
Nauru *volume 9 page 22*

yarmulka (Judaism)
boys studying Judaism *picture, volume 7 page 37*

yarn (fiber)
knitting *volume 7 page 75*
rug and carpet *volume 11 page 101*

Yarra River (river in Victoria, Australia)
Melbourne *picture, volume 1 page 230*

Y chromosome (biology)
gender determination *picture, volume 5 page 93*
genetics *volume 5 page 93*

year
calendar *volume 3 page 9*
time *volume 13 page 67*

yeast (fungus)
fermentation *volume 5 page 11*
rising dough *picture, volume 4 page 144*

Yehudi (people): *see in index* Jewish people

yellow (color)
light *picture, volume 3 page 155*
pigment *picture, volume 3 page 156*

yellow anaconda (reptile)
anacondas *volume 1 page 113*

yellow-bellied sea snake (reptile)

sea snake *volume 12 page 60*

various snakes *picture, volume 12 page 113*

yellow-headed blackbird (bird)

blackbirds *volume 2 page 84*

yellow jacket (insect)

wasp *volume 15 page 21*

yellow mongoose (mammal) *picture,*

volume 8 page 165

yellow mustard (plant and condiment):

see in index white mustard

yellow pitcher plant (plant)

pitcher plant *volume 10 page 90*

Yellow River (river in China): *see in index*

Huang He

yellowspot emperor fish *picture, volume 5 page 27*

Yellowstone National Park (national park in the U.S.)

national parks *volume 9 page 15*

wapiti *picture, volume 15 page 7*

Yeltsin, Boris (president of Russia)

MAIN ARTICLE *volume 15 page 89, picture, volume 15 page 89*

Yemen (country in the Middle East)

MAIN ARTICLE *volume 15 page 90, picture, volume 15 page 90*

MORE TO EXPLORE

Middle East *volume 8 page 124*

Sanaa *picture, volume 12 page 26*

Yemen Arab Republic (historical country in the Middle East)

Yemen *volume 15 page 91*

yerba maté (beverage): *see in index* maté

Yerevan (capital city of Armenia)

MAIN ARTICLE *volume 15 page 92, picture, volume 15 page 92*

MORE TO EXPLORE

Armenia *volume 1 page 184*

monument *picture, volume 1 page 185*

yeshiva (Judaism)

young men studying the Talmud *picture, volume 13 page 14*

Yeti (mythology): *see in index* Abominable Snowman

yew (tree and shrub)

MAIN ARTICLE *volume 15 page 92, picture, volume 15 page 93*

Yi dynasty (Korean history): *see in index*

Choson dynasty

Yoemem (Native American people): *see in*

index Yaqui

Yoga (philosophy and exercise)

MAIN ARTICLE *volume 15 page 93, picture, volume 15 page 93*

yolk (animal reproduction)

egg *volume 4 page 108*

Yom Kippur (Judaism)

MAIN ARTICLE *volume 15 page 94, picture, volume 15 page 94*

MORE TO EXPLORE

Rosh Hashana *volume 11 page 98*

Yom Kippur War (Middle East, 1973)

Arab-Israeli wars *volume 1 page 158*

York (historical town in Ontario,

Canada): *see in index* Toronto

Yorktown (historic town in Virginia, U.S.)

American Revolution *volume 1 page 102*

Yoruba (people)

Nigeria *volume 9 page 68*

Yosemite Falls (waterfalls in California, U.S.) *picture, volume 14 page 24*

Yosemite National Park (national park in California, U.S.)

Yosemite Falls *picture, volume 14 page 24*

Young, Brigham (U.S. religious leader)

picture, volume 8 page 181

Mormons *volume 8 page 182*

“You’re a Good Man, Charlie Brown”

(stage musical)

Schulz *volume 12 page 48*

Yuan Dynasty (Chinese history)

Mongol Empire *volume 8 page 162*

Mongolia *volume 8 page 164*

Polo *volume 10 page 119*

Yucatán Peninsula (peninsula in Mexico)

MAIN ARTICLE *volume 15 page 94*

Yugoslavia (historic country in Europe, 1929-2003)

MAIN ARTICLE *volume 15 page 95*

MORE TO EXPLORE

Balkan Peninsula *volume 2 page 13*

Bosnia and Herzegovina *volume 2 page 113, volume 12 page 37*

Croatia *volume 3 page 219*

Macedonia *volume 8 page 5*

Montenegro *volume 8 page 175*

Serbia *volume 12 page 72*

Slovenia *volume 12 page 110*

Yukon (territory in Canada)

MAIN ARTICLE *volume 15 page 97*

MORE TO EXPLORE

geography

Dawson *picture, volume 15 page 98*

wilderness *picture, volume 15 page 98*

gold rush *volume 5 page 123*

Yukon River (river in North America)

MAIN ARTICLE *volume 15 page 96, picture, volume 15 page 96*

MORE TO EXPLORE

Dawson *picture, volume 15 page 98*

Yukon Territory (territory in Canada):

see in index Yukon

yurt (shelter) *picture, volume 8 page 164*

Yushchenko, Viktor (president of

Ukraine)

Ukraine *volume 14 page 7*



Zadar (city in Croatia)

Crusades *volume 3 page 224*

Zagreb (capital city of Croatia)

MAIN ARTICLE *volume 15 page 100, picture, volume 15 page 100*

MORE TO EXPLORE

Croatia *volume 3 page 218*

Zaharias, Babe Didrikson (U.S. athlete)

MAIN ARTICLE *volume 15 page 100*

Zaire, Republic of (country in Africa):

see in index Congo, Democratic Republic of the

Zambezi River (river in Africa) *picture*,
volume 15 page 101
Mozambique volume 8 page 200

Zambia (country in Africa)
MAIN ARTICLE volume 15 page 101, *pic-
ture*, volume 15 page 101

Zanzibar (island in Tanzania)
Tanzania volume 13 page 15

Zapata, Emiliano (Mexican revolution-
ary)

MAIN ARTICLE volume 15 page 102, *pic-
ture*, volume 15 page 102

MORE TO EXPLORE

Mexico volume 8 page 112

Villa volume 14 page 91

“Zapatistas” (painting by Orozco) *pic-
ture*, volume 10 page 11

Zapotec (people)
MAIN ARTICLE volume 15 page 103

Zara (city in Croatia): *see in index* Zadar

Zarathustra (Iranian religious leader): *see
in index* Zoroaster

Zeami (Japanese playwright)
drama volume 4 page 73

zebra (mammal)
MAIN ARTICLE volume 15 page 102, *pic-
ture*, volume 15 page 103

MORE TO EXPLORE

migration in Kenya *picture*, volume 8
page 125

Ngorongoro Crater in Tanzania *picture*,
volume 13 page 15

Zebu (breed of cattle): *see in index* Brah-
man

Zeil, Mount (mountain in Northern Ter-
ritory, Australia)
Northern Territory volume 9 page 91

zeppelin (aircraft)
airship volume 1 page 58
World War I volume 15 page 64

Zeppelin, Ferdinand von (German
builder)
airship volume 1 page 58

Zerubbabel's Temple (Judaism): *see in
index* Jerusalem, Temple of

Zeus (Greek god)
MAIN ARTICLE volume 15 page 103, *pic-
ture*, volume 15 page 104

MORE TO EXPLORE

Aphrodite volume 1 page 148

Athena volume 1 page 218

Atlas volume 1 page 222

Demeter volume 4 page 34

Hades volume 6 page 5

Hera volume 6 page 43

Heracles volume 6 page 44

Hermes volume 6 page 46

Muses volume 8 page 209

Pandora volume 10 page 26

Pegasus volume 10 page 50

Poseidon volume 10 page 135

Prometheus volume 10 page 155

Titans volume 13 page 70

Zhou dynasty (Chinese history)
China volume 3 page 103

ziggurat (Mesopotamian temple tower)
architecture volume 1 page 169
temple volume 13 page 42

Zijincheng (palace area in Beijing,
China): *see in index* Forbidden City

Zimbabwe (country in Africa)
MAIN ARTICLE volume 15 page 105, *pic-
ture*, volume 15 page 105

MORE TO EXPLORE

geography

Great Zimbabwe city *picture*, volume 5
page 149

Harare *picture*, volume 6 page 16

human rights march *picture*, volume 6
page 97

zinc (chemical element)
brass volume 2 page 123

zine (publication)
magazine volume 8 page 15

Zionism (nationalistic movement)
Israel volume 6 page 169
Judaism volume 7 page 39

Zn (chemical element): *see in index* zinc

Zócalo (plaza in Mexico City, Mexico)
Mexico City volume 8 page 113

zodiac (astronomy)
MAIN ARTICLE volume 15 page 107, *pic-
ture*, volume 15 page 107

MORE TO EXPLORE

constellation volume 3 page 188

Zog I (king of Albania)
Albania volume 1 page 66

zoo
MAIN ARTICLE volume 15 page 107

MORE TO EXPLORE

California condor chick *picture*, vol-
ume 15 page 108

San Diego Zoo *picture*, volume 15
page 107

veterinary medicine volume 14 page 75,
picture, volume 14 page 75

Zoological Society of London (British
organization)
aquarium volume 1 page 155

zoology (study of animals)
MAIN ARTICLE volume 15 page 108, *pic-
ture*, volume 15 page 109

zooplankton (marine biology)
ocean volume 9 page 118
plankton volume 10 page 94, *picture*,
volume 10 page 94

Zoroaster (Iranian religious leader)
Zoroastrianism volume 15 page 109

Zoroastrianism (religion)
MAIN ARTICLE volume 15 page 109
MORE TO EXPLORE
ceremony *picture*, volume 15 page 109

Zulu (people)
prince in traditional clothing *picture*,
volume 12 page 138
Swaziland volume 12 page 211

Zuni (Native American people)
MAIN ARTICLE volume 15 page 110
MORE TO EXPLORE
Zuni adobe houses *picture*, volume 10
page 164
Zuni potter *picture*, volume 15 page 110

Zwingli, Huldrych (Swiss religious
leader)
Reformation volume 11 page 39

Credits

Volume 1

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Volume 2

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Volume 3

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Volume 4

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Volume 5

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Volume 6

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Volume 7

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Volume 8

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Volume 9

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Volume 10

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Volume 11

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Volume 12

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Volume 13

Page 4: (top and bottom, inset) Library of Congress, Washington D.C.; **5:** Staffan Widstrand/Nature Picture Library; **6:** Steve Maslowski/Photo Researchers, Inc.; **7:** © Spectrum Colour Library/Heritage-Images; **9:** © Spectrum Colour Library/Heritage-Images; **10:** Nevada Wier/Corbis; **11:** © Spectrum Colour Library/Heritage-Images; **12:** (left) James Randklev—Photographer's Choice/Getty Images, (right) Hulton-Deutsch Collection/Corbis; **13:** Steve Vidler/SuperStock; **14:** © Ted Spiegel/Corbis; **15:** © Spectrum Colour Library/Heritage-Images; **16:** Mike Wilkes/Nature Picture Library; **17:** (left and right) Michael & Patricia Fogden/Corbis; **18:** Yoshio Tomii/SuperStock; **19:** Joe Stancampiano—National Geographic/Getty Images; **20:** Dallas & John Heaton—Free Agents Limited/Corbis; **21:** Jim Frost—Chicago Sun-Times/AP; **22:** (left) Mansell—Time Life Pictures/Getty Images, (right) Library of Congress, Washington, D.C. (neg. no. LC-USZ62-13012); **23:** (inset) Library of Congress, Washington, D.C. (neg. no. LC-USZ62-13012); **24:** (left) Vano Shlamov/Getty Images, (right) Neil Rabinowitz/Corbis; **25:** Martin Land/Photo Researchers, Inc.; **26:** The Granger Collection, New York; **27:** (top) The Granger Collection, New York, (bottom) The National Archives/Corbis; **28:** Peter Bowater/Alamy; **29:** Syner-Comm/Alamy; **30:** Hulton Archive/Getty Images; **31:** Encyclopædia Britannica, Inc.; **32:** Alain le Garsmeur/Corbis; **33:** (left) Enric Marti/AP, (right) Oliver

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Volume 14

Page 4: Ingo Arndt/Nature Picture Library; **5:** S. Trevor/Bruce Coleman Inc.; **6:** age fotostock/SuperStock; **7:** David Cumming—Eye Ubiquitous/Corbis; **8:** Alain le Garsmeur/Corbis; **9:** North Wind Picture Archives; **10:** Magrath/Folsom/Photo Researchers, Inc.; **12:** (left) age fotostock/SuperStock, (right) Mary Evans Picture Library;

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Volume 15

Page 4: Steve Vidler/SuperStock; **5:** Scott Camazine/Photo Researchers, Inc.; **6:** Norbert Rosing—National Geographic/Getty Images; **7:** (left) North Wind Picture Archives, (right) age fotostock/SuperStock; **9:** North Wind Picture Archives; **10:** China Newsphoto/Corbis; **11:** AP; **13:** The Granger Collection, New York; **14:** age fotostock/SuperStock; **16:** Dale Jorgensen/SuperStock; **17:** Library of Congress, Washington, D.C.; **18:** © Rex Stucky—National Geographic/Getty Images; **19:** The Granger Collection, New York; **20:** (inset) Library of Congress, Washington, D.C.; **21:** © Anthony Bannister—Gallo Images/Corbis; **22:** (left) age fotostock/SuperStock, (right) Mauritius/SuperStock; **23:** Encyclopædia Britannica, Inc.;

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Volume 16

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INDEX

